LIFE SCIENCES

Courses

ANAT 100 Anatomy of the Human Body Units: 3.00
This anatomy course is designed to introduce students to the basic structure and functional relationship of the human body. Through a series of weekly learning modules, students will learn about the basic language of Gross Anatomy and Histology in order to understand the working of various body systems. This course is also suitable for individuals who have a general interest in human anatomy.
Requirements: Exclusion ANAT 101/3.0; IDIS 150/6.0 One-Way Exclusion May not be taken with or after: ANAT 215/3.0; ANAT 216/3.0; ANAT 312/3.0; ANAT 315/3.0; ANAT 316/3.0
Offering Faculty: Faculty of Health Sciences

ANAT 101 Introductory Human Anatomy Units: 3.00
A basic anatomy course with an emphasis on clinical relevance of structure and function of human body systems. RECOMMENDATION 4U Biology.
Requirements: Exclusion ANAT 101/3.0; IDIS 150/6.0 One-Way Exclusion May not be taken with or after: ANAT 215/3.0; ANAT 216/3.0; ANAT 312/3.0; ANAT 315/3.0; ANAT 316/3.0
Offering Faculty: Faculty of Health Sciences

ANAT 215 Principles of Human Morphology I Units: 3.00
The general principles of human structure and function as appreciated through a survey of the morphological sciences, including: history of anatomy; embryology; neuroanatomy; developmental, microscopic and gross anatomy of the locomotor system.
NOTE Priority will be given to students registered in a LISC Specialization Plan.
Requirements: Prerequisite (BIOL 102 and BIOL 103) or (BIOL 201 and BIOL 202) or permission of the Department of Biomedical Molecular Sciences. Exclusion ANAT 315.
Offering Faculty: Faculty of Health Sciences

ANAT 216 Principles of Human Morphology II Units: 3.00
The general principles of human structure and function as appreciated through a survey of the development, microscopic and gross anatomy of the body systems: cardiovascular, respiratory, immune/lymphatic, endocrine, digestive and genitourinary.
NOTE Priority will be given to students registered in a LISC Specialization Plan.
Requirements: Prerequisite ANAT 215. Exclusion ANAT 316.
Offering Faculty: Faculty of Health Sciences

ANAT 270 Human Anatomy and Morphology Units: 3.00
This course is designed to introduce the foundations of human structure and function to students at all levels of post-secondary education. Through a series of learning modules, students will develop an understanding of the architecture of the human body through interactive study using a virtual cadaver. This course will survey the gross and microscopic anatomy of the body organ systems including the skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic/immune, respiratory, digestive, urinary and reproductive systems.
NOTE Only offered online. Consult the Bachelor of Health Sciences program office.
NOTE May not be taken for credit towards the Plan requirements of the LISC Specialization or Major Plans.
LEARNING HOURS 120 (60O;60P)
Requirements: Prerequisite Level 2 and one of (ANAT 100; BIOL 102; PHGY 170) One-Way Exclusion May not be taken with or after ANAT215; ANAT216; ANAT315; ANAT316.
Offering Faculty: Faculty of Health Sciences

ANAT 309 Functional Histology Units: 3.00
Introduction to mammalian histology, or microscopic anatomy, a branch of anatomical sciences focusing on structures and functions of tissues and cells at the light and electron microscope level. Structure-function relationships within many tissues and organs at the cell and tissue level will be a focus.
NOTE Priority will be given to students registered in a LISC Specialization Plan or Health Sciences plan.
LEARNING HOURS 120 (36L;24Lb;60P)
Requirements: Prerequisite Level 3 or above and (PHGY 170 or BIOL 102 or BIOL 103 or BIOL 202).
Offering Faculty: Faculty of Health Sciences

ANAT 312 Functional Neuroanatomy Units: 3.00
Study of the structure and function of the nervous system by lectures, hands-on laboratories, brain dissection, and readings. Topics include, but are not limited to, sensory and motor systems, brain imaging, and clinical examples.
Requirements: PREREQUISITES (ANAT 215/3.0 and ANAT 216/3.0) or (ANAT 315 and ANAT316).
Offering Faculty: Faculty of Health Sciences

ANAT 315 The Human Musculoskeletal System Units: 3.00
Gross and functional anatomy of the back, body wall, upper and lower limbs, including blood supply and neural controls.
Requirements: BIOL101 OR BIOL200 OR PHED153 OR (BIOL102 AND BIOL103) OR (BIOL201 AND BIOL202) OR KNPE153
Offering Faculty: Faculty of Health Sciences

ANAT 316 The Human Visceral Systems Units: 3.00
Gross and functional anatomy of the thorax, abdomen and pelvis, head and neck.
Requirements: PREREQUISITES (BIOL 102/3.0 and BIOL 103/3.0) or (BIOL 201/3.0 and BIOL 202/3.0) or PHED 153/3.0 or KNPE153/3.0, or permission of the Department
Exclusion No more than 3.0 units from ANAT216; ANAT316
Offering Faculty: Faculty of Health Sciences

ANAT 380 Clinically Relevant Human Anatomy Units: 3.00
ANAT 380 will explore regional anatomy of the human body focusing on the major organ systems, their components, and the relationships between them. In this course, students will apply anatomical knowledge to collaboratively solve case-based clinical scenarios, and develop a realistic clinical case based on an underlying anatomical issue.
Note: Also offered online.
LEARNING HOURS may vary 120(48O;72P)
Requirements: Minimum 2nd year (Level 2) standing and one of [ANAT 100/3.0; ANAT 101/3.0; (ANAT 215/3.0 and ANAT 216/3.0);(ANAT 315/3.0 and ANAT 316/3.0)]; and one of [(PHGY 215/3.0 and PHGY 216/3.0);(KNPE 125/3.0 and KNPE 225/3.0)]}
Offering Faculty: Faculty of Health Sciences

ANAT 409 Selected Topics in Histology Units: 3.00
A focused histological and cell biological study of three selected mammalian tissues, organs and/or systems.
Requirements: PREREQUISITE Level 4 and (a GPA of 2.5) and (registration in a LISC Major or Specialization Plan) and [(ANAT309 or (ANAT215 and ANAT216) or (ANAT315 and ANAT316)].
Offering Faculty: Faculty of Health Sciences

ANAT 417 Mammalian Embryonic Development Units: 3.00
Comprehensive overview of cellular and molecular mechanisms that direct embryogenesis including gastrulation, neurulation, establishment of body axes, differentiation, sex determination, limb development, organogenesis, and teratology. Participation in seminar presentations and group discussions is required.
LEARNING HOURS 114 (24L;12S;1I;77P)
Requirements: PREREQUISITE Level 4 and (a GPA of 2.5) and (registration in a LISC Major or Specialization Plan) and [(ANAT309 or (ANAT215 and ANAT216) or (ANAT315 and ANAT316)].
Course Equivalencies: ANAT 417, ANAT 471
Offering Faculty: Faculty of Health Sciences

ANAT 425 Research Topics In Anat & Cell Units: 6.00
Offering Faculty: Faculty of Health Sciences

ANAT 471 Human Embryology Units: 3.00
In ANAT 471, students work individually/collaboratively to explore stages of normal human embryonic and fetal development and how changes in underlying mechanisms link to common congenital or developmental abnormalities. Various assessments include quizzes, a journal club, a PBL investigating a developmental abnormality, a midterm and final exam.
LEARNING HOURS 120 (48O;72P).
Requirements: Prerequisite Level 3 or above and one of ([ANAT 100 and ANAT 380] or [ANAT 101 and ANAT 380] or [ANAT 215 and ANAT 216] or [ANAT 315 and ANAT 316]).
Equivalency ANAT 417.
Course Equivalencies: ANAT 417, ANAT 471
Offering Faculty: Faculty of Health Sciences

ANAT 499 Research Project in Anatomy and Cell Biology Units: 12.00
An examination of the development and present state of knowledge in selected research areas of Anatomy and Cell Biology. Research project involves experimental design, data collection and analysis, written report, poster presentation and oral presentation. Students will be required to attend seminars and tutorials on topics related to research. Limited enrolment; restricted to fourth year honours, permission of the department required.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in a LISC Specialization Plan and a cumulative GPA of 2.50 or higher and ([ANAT 215 and ANAT 216] or ANAT 309 or [ANAT 315 and ANAT 316]). Exclusion CANC 499; EPID 499; LISC 499; MICR 455; MICR 499; NSCI 499; PATH 499; PHAR 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

ANAT 799 Introduction To Animal Care Units: 6.00
Offering Faculty: Faculty of Health Sciences

ANAT 808 Biology Of Reproduction Units: 3.00
This seminar course will cover current topics in male and female reproduction and pregnancy. The format includes critiques of original publications and attendance of and reports on the interdepartmental reproductive seminar series. Credit value: 0.5, spread over Fall and Winter terms (every second year). Attendance and reporting of interdepartmental reproductive group seminars:12 h Overview lectures by professors on assigned topics:12 h Presentation and participation in student seminars:12 h Minimal quota of students for course to run:4 Course Coordinators: Various Graduate Faculty but overseen by a designated Faculty. Not offered 2010-2011.
Offering Faculty: Faculty of Health Sciences

ANAT 814 Medical Gross Anatomy Units: 6.00
A detailed study of the gross and functional anatomy of the human body with emphasis on clinical application. The course is given jointly with part of Phase I of the medical curriculum. Additional work prescribed for graduate students. Full course; lectures, laboratories and tutorials. C.W.Reifel and Staff. Learning Materials: $40
Offering Faculty: Faculty of Health Sciences

ANAT 818 Chemical Neuroanatomy Units: 3.00
A contemporary and comprehensive assessment of the neurochemical features of the mammalian nervous system as they relate to development, function and disease. Winter term; 3 hour lecture/seminar. Offered alternate years. M.D. Kawaja. Offered 2010-2011.
Offering Faculty: Faculty of Health Sciences

ANAT 822 Cell & Molecular Neuroscience Units: 3.00
An in-depth study of the biophysical properties of neurons and diseases that affect the function of neurons and glia. Topics will include cable properties of dendrites, voltage- and ligand-dependent channels, and molecular mechanisms responsible for neuronal death and regeneration. The course will be based on lectures and student seminars of selected readings. Given concurrently with LISC-422*, with additional assignments for graduate students.
Offering Faculty: Faculty of Health Sciences

ANAT 825 Medical Neuroscience Units: 6.00
A multidisciplinary graduate level course exposing students to the clinical aspects of neuroscience. Didactic lectures cover detailed organization of the nervous system with clinical implications. Laboratories review basic neuroanatomy and pathology. Clinical demonstrations expose students to several neurological disorders. Fall; didactic lectures, laboratories, and clinical cases (up to 20 hr/week; 9 weeks total) M.D. Kawaja (Anatomy and Cell Biology), D. Munoz (Physiology), J. Reynolds (Pharmacology and Toxicology)
Offering Faculty: Faculty of Health Sciences

ANAT 826 Sensorimotor Integration Units: 3.00
A course for graduate students to explore more advanced concepts of sensorimotor integration in the nervous system. This is a multi-disciplinary lecture/seminar course with active student participation expected. The course will consist of weekly sessions focusing on specific concepts such as feature detection, population coding, sensorimotor transformations, reflexes versus voluntary control, central pattern generators. Normally offered concurrently with PSYC-924*. Winter term; 1 hour lecture; 2 hour seminar/discussion. S. Scott
Offering Faculty: Faculty of Health Sciences

ANAT 833 Topics In Mammalian Histology Units: 3.00
Detailed histological assessment of selected organs and tissues. Winter Term, alternating years. Lectures and seminars. M.D. Kawaja. Not offered 2010-2011.
Offering Faculty: Faculty of Health Sciences

ANAT 834 Principles and Techniques in the Teaching of Anatomical Sciences Units: 3.00
A series of lectures and workshops illustrating modern teaching philosophy and technique specifically designed for teaching Anatomy in the Health Sciences.Fall Term. Drs. R.A. Easteal and L.W. MacKenzie.
Offering Faculty: Faculty of Health Sciences

ANAT 835 Microteaching in Anatomical Sciences Units: 3.00
Microteaching as a technique for new and experienced teachers will involve the presentation of a series of 3-minute micro lectures with video recording and feed back sessions.Winter Term. Drs. R. A. Easteal and L. W. MacKenzie.
Offering Faculty: Faculty of Health Sciences

ANAT 836 Advanced Topics In Embryonic D Units: 3.00
This half-credit course will be offered to students who have completed ANAT-417* in their undergraduate studies in the Queen's Life Sciences Program. Through a series of tutorials and seminars, the course will focus on the most up-to-date discoveries in three areas of developmental biology. The areas reflect the expertise in the department. Winter Term. Dr C.W. Reifel.
Offering Faculty: Faculty of Health Sciences

ANAT 837 Advanced Topics - Neuroanatomy Units: 3.00
This half-credit course will be offered to students who have completed ANAT-312* in their undergraduate studies in the Queen's Life Sciences Program. Through a series of tutorials and seminars, the course will focus on the most up-to-date discoveries in three areas of neuroanatomy. The areas reflect the expertise in the department. Fall Term. R.D. Andrew
Offering Faculty: Faculty of Health Sciences

ANAT 838 Advanced Histology & Staining Units: 3.00
An advanced mammalian histology course including advanced staining techniques in demonstrating various components of Histological sections.Winter Term. Drs. L.W. MacKenzie and S.C. Pang.
Offering Faculty: Faculty of Health Sciences

ANAT 839 Selected Topics In Pregnancy Units: 6.00
The course has two components. A 7 week (26 hour) series of discussions on assigned readings, selected readings and a 45 minute presentation by each student on medical and ethical aspects of obstetrics, gynaecology, endocrinology, population and gender health and psychology. The second component is a 50 hour Human Placenta Research Summer Workshop. Summer Term. Dr. B.A. Croy
Offering Faculty: Faculty of Health Sciences

ANAT 840 Res Tech Cell Mol Bio Units: 3.00
This course is designed to equip graduate students with modern research techniques in Cell and Molecular Biology. This intense 2-week course consists of 2-3 hours of lecture and 6-8 hours hands-on laboratory exercise per day. Techniques include light microscopy and immunohistochemistry, electron microscopy and immunocytochemistry, RNA, DNA and protein isolation, Northern and Western blot analysis, probe design, and conventional and realtime PCR. Summer Term in odd years. Dr. M.Y. Tse and Dr. S.C. Pang
Offering Faculty: Faculty of Health Sciences

ANAT 847 Research Projects in Anatomy and Cell Biology Units: 3.00
An investigation into concepts and techniques in selected areas of research offered in the Department of Anatomy. Research projects carried out under the supervision of a staff member. Winter term. S.C. Pang, Staff
Offering Faculty: Faculty of Health Sciences

ANAT 889 Practicum Units: 6.00
Offering Faculty: Faculty of Health Sciences

ANAT 925 Current Topics In Anatomy Units: 6.00
Offering Faculty: Faculty of Health Sciences

ANAT 926 Topics In Anatomy & Cell Biol. Units: 3.00
The topics will be chosen on the basis of special needs of the students, and must be approved by the Coordinator of Graduate Studies. Fall or winter; seminars.
Offering Faculty: Faculty of Health Sciences

ANAT 999 Ph.D. Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

BCHM 102 Introduction to Biochemistry Units: 3.00
Chemical principles as applied to biochemistry, human and clinical biochemistry.
NOTE Primarily intended for students in Nursing. Arts and Science students require permission of the Department.
LEARNING HOURS 118 (24L;16T;6G;36O;36P)
RECOMMENDATION 4U Chemistry.
Requirements: BCHM102 Exclusion
Offering Faculty: Faculty of Health Sciences

BCHM 218 Molecular Biology Units: 3.00
Molecules and macromolecules that participate in the replication and expression of genes. Current methods for exploring the structure, function, and manipulation of genetic material.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office.
LEARNING HOURS may vary. 120 (36L;12T;72P)
EQUIVALENCY MBIO 218/3.0.
Requirements: Minimum 2nd year (Level 2) standing and one of (BIOL 102/3.0; PHGY 170/3.0) and one of (CHEM 112/6.0; CHEM 114/3.0).
Course Equivalencies: BCHM218; MBIO218;MBIO318
Offering Faculty: Faculty of Health Sciences

BCHM 270 Biochemical Basis of Health and Disease Units: 3.00
This course will introduce general biochemical concepts that will allow for an understanding of the biological and chemical principles underlying human physiology, health and disease. The course will provide self-paced learning and utilize evidence-based teaching principles, small group learning, peer-learning and guided-independent learning methodologies to provide an inclusive learning environment. Students will gain an enhanced appreciation of general applications of biochemistry as applied in day to day healthy life and during the disease states, diagnosis and clinical management of metabolic disorders.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office.
NOTE This introductory biochemistry online course is intended for prospective students in Nursing, Environmental Sciences, Engineering, Commerce, and general science programs.
NOTE May not be taken for credit towards the Plan requirements of the BCHM or LISC Specialization or Major Plans.
LEARNING HOURS may vary 126 (66O;60P)
Requirements: Minimum 2nd year (Level 2) standing and [(PHGY 170/3.0) or (BIOL 102/3.0 and BIOL 103/3.0)], or permission of the instructor. Exclusion BCHM 102/3.0 One-Way exclusion May not be taken with or after BCHM 310/6.0; BCHM 315/3.0.
Offering Faculty: Faculty of Health Sciences

BCHM 310 General Biochemistry Units: 9.00
Principles of protein biochemistry, enzymology, and protein engineering. Metabolism of carbohydrates, amino acids and lipids. Role of coenzymes. Generation and storage of metabolic energy. Principles of regulatory mechanisms, membrane structure and function, hormone action, and cellular signalling.
NOTE Students lacking the prerequisites CHEM 222/3.0 or CHEM 282/3.0 may take these courses as a corequisite with permission of the Department.
LEARNING HOURS 348 (72L;36Lb;240P)
Requirements: CHEM280 OR (CHEM281 AND CHEM282) OR (CHEM223 AND MBIO218) OR (CHEM223 AND CHEM222) OR (CHEM223 AND CHEM222) OR (CHEM223 AND MBIO318) OR (CHEM211 AND CHEM245) OR (CHEM211 AND CHEM212)
Offering Faculty: Faculty of Health Sciences

BCHM 313 Physical Biochemistry Units: 3.00
This course will provide an in depth view of the molecular mechanisms controlling how genes are organized, regulated and expressed in mammalian cells. Once you understand how proteins are made, you will learn a variety of approaches to visualize and measure proteins and enzymatic activities in mammalian cells.
NOTE If you have taken or are currently registered in BCHM 310/9.0 you may contact the department for permission to enroll.
LEARNING HOURS 120 (36L;84P)
Requirements: Prerequisite Level 3 or above and BCHM315
Offering Faculty: Faculty of Health Sciences

BCHM 315 Proteins and Enzymes Units: 3.00
Principles of protein biochemistry, enzymology, and protein engineering.
NOTE Students lacking the prerequisites CHEM 222 or CHEM 282 may take these courses as a corequisite with permission of the Department.
LEARNING HOURS 120 (36L;12O;72P).
Requirements: Prerequisite Level 3 or above and BCHM 218 and ([CHEM 222 and CHEM 223] or CHEM 282). Exclusion BCHM 102; BCHM 310.
Offering Faculty: Faculty of Health Sciences

BCHM 316 Metabolism Units: 3.00
Metabolism of carbohydrates, amino acids and lipids. Role of coenzymes. Generation and storage of metabolic energy. Principles of regulatory mechanisms, membrane structure and function, hormone action, and cellular signalling.
LEARNING HOURS 122 (36L;8O;78P)
Requirements: Prerequisite BCHM 315 Exclusion BCHM 102; BCHM 310
Offering Faculty: Faculty of Health Sciences

BCHM 317 Introductory Biochemistry Laboratory Units: 6.00
Application of separation and assay techniques to the study of proteins, metabolism and molecular biology. Attendance required in both terms. Enrollment will be limited because of laboratory constraints, and selection will be based on academic standing.
LEARNING HOURS 360 (96Lb;264P)
Requirements: Prerequisite Reg. in a BCHM Specialization or Major Plan. Corequisite BCHM315 and BCHM316. Exclusion No more than 6.0 units from BCHM317; BCHM319.
Offering Faculty: Faculty of Health Sciences

BCHM 319 Introductory Biochemistry Laboratory Units: 3.00
Application of separation and essay techniques to the study of proteins, metabolism and molecular biology.
NOTE This course is for outgoing Biochemistry Honours exchange students who are not able to obtain the equivalent of BCHM 317/6.0 when on exchange.
LEARNING HOURS 180 (48Lb;132P)
Requirements: coreq BCHM315
Course Equivalencies: BCHM317B; BCHM319
Offering Faculty: Faculty of Health Sciences

BCHM 370 Genetics and Genomics Units: 3.00
An introduction to the field of applied genomics for identifying genes underlying multi-factorial traits, diseases, and drug treatment outcomes. Basic principles of gene mapping studies will be covered in the context of recent advances in the field including statistical methods, and integrative analyses of biological datasets.
Notes: Also offered online
LEARNING HOURS may vary: 120(48O;72P)
Requirements: Minimum 3rd year (Level 3) standing and one of (BCHM 218/3.0; BCHM 270/3.0) or permission of the instructor. . Exclusion BIOL 331/3.0.
Offering Faculty: Faculty of Health Sciences

BCHM 410 Protein Structure and Function Units: 3.00
This course presents an integrated approach to the study of protein function. Topics include proteomic techniques, mass spectrometry, protein purification, imaging, surface plasmon resonance, calorimetry, bioinformatics and protein evolution, protein modifications and processing, interpretation and applications of 3-D structure, and structure-function relationships.
NOTE Offered jointly with BMED 810/3.0. Students in a LISC or BMCO Plan should contact the Department regarding prerequisites and permission to register.
Requirements: Prerequisite Level 4 and registration in a BCHM Specialization or Major Plan) and (a GPA of 2.50 in 12 units from BCHM218; BCHM313; BCHM315; BCHM316, BCHM317).
Offering Faculty: Faculty of Health Sciences

BCHM 411 Advanced Molecular Biology Units: 3.00
This course concentrates on the molecular biology of mammalian models particularly mechanisms involved in human diseases. The human genome project, forensic analysis, DNA diagnostics of human diseases, models of transcriptional and growth regulation and cancer, DNA repair, RNA processing and translation are all discussed. Emphasis on recent findings and course materials will be drawn from current reviews.
NOTE Offered jointly with BMED 811/3.0. Students in a LISC or BMCO Plan should contact the Department regarding prerequisites and permission to register.
LEARNING HOURS 120 (36L;84P)
Requirements: Prerequisite Level 4 and registration in a BCHM Specialization or Major Plan) and (a GPA of 2.50 in 12 units from BCHM218; BCHM313; BCHM315; BCHM316, BCHM317).
Offering Faculty: Faculty of Health Sciences

BCHM 421 Advanced Biochemistry Laboratory I Units: 6.00
Biochemical research techniques with emphasis on nucleic acids, protein structure and function, regulation of gene expression and metabolic control processes.
NOTE 6.0-unit course offered in the Fall Term.
Requirements: PREREQUISITE Level 4 and registration in a BCHM Specialization Plan and (a GPA of 2.9 in 12 units of BCHM 218/3.0; BCHM 313/3.0; BCHM 315/3.0; BCHM 316/3.0; BCHM 317/6.0)
Offering Faculty: Faculty of Health Sciences

BCHM 422 Advanced Biochem Lab II Units: 6.00
An independent research project by each student in one of the departmental research labs. Evaluation is based on oral presentation, lab performance and a thesis.
NOTE 6.0-unit course offered in the Fall Term.
Requirements: PREREQUISITE Level 4 and registration in a BCHM Specialization Plan and (a GPA of 2.9 in 12 units of BCHM 218/3.0; BCHM 313/3.0; BCHM 315/3.0; BCHM 316/3.0; BCHM 317/6.0)
Offering Faculty: Faculty of Health Sciences

BCHM 431 Biochem Regulatory Mechanisms Units: 3.00
Requirements: BCHM310 OR (BCHM315 AND BCHM316) OR (BCHM315 AND BCHM317)
Offering Faculty: Faculty of Arts and Science

BCHM 432 The Molecular Basis of Cellular Function Units: 3.00
Principles of regulatory mechanisms; regulation of cellular function and growth by oncogenes, growth factors, isoprenoids and steroid hormones. Receptors, second messengers and protein phosphorylation. Correlation of cell ultrastructure with biochemical function. Description of the components, assembly, metabolism and evolution of cellular structures are described.
NOTE Offered jointly with BMED 832/3.0. Students in a LISC Plan should contact the Department regarding prerequisites and permission to register.
LEARNING HOURS 120 (30L;6G;84P)
Requirements: Prerequisite Level 4 and registration in a BCHM Specialization or Major Plan) and (a GPA of 2.50 in 12 units from BCHM218; BCHM313; BCHM315; BCHM316, BCHM317).
Offering Faculty: Faculty of Health Sciences

BCHM 433 Biochemistry Of The Cell Units: 3.00
Requirements: BCHM310 OR (BCHM315 AND BCHM316) OR (BCHM315 AND BCHM317)
Offering Faculty: Faculty of Arts and Science

BCHM 441 Current Topics in Biochemistry Units: 3.00
Tutorials, assignments and demonstrations in important subjects in biochemistry emphasizing topics of broad interest. Particular emphasis will be paid to the applications of biochemical knowledge and new technologies.
NOTE Students in the BCHM Specialization Plan registered in BCHM 421 and BCHM 422 will not be allowed to register in BCHM 441; Students in the LISC Specialization Plan registered in one of ANAT 499, CANC 499, EPID 499, LISC 499, MICR 455, MICR 499, NSCI 499, PATH 499, PHAR 499or PHGY 499 will not be allowed to register in BCHM 441.
LEARNING HOURS 120 (21L;9S;3G;3Oc;84P).
Requirements: Prerequisite Level 4 or above and registration in a BCHM Major Plan and (a GPA of 2.50 in 12.0 units of BCHM 218; BCHM 313; BCHM 315; BCHM 316; BCHM 317).
Offering Faculty: Faculty of Health Sciences

BCHM 442 Seminars in Biochemistry Units: 3.00
Seminars, assignments and demonstrations focused on important subjects in biochemistry, emphasizing the scientific pipeline, from discovery to commercialization. Particular emphasis will be placed on applications of biochemical knowledge and new technologies.
NOTE Students in the BCHM Major Plan registered in BCHM 441/3.0 will not be allowed to register in BCHM 442/3.0.
LEARNING HOURS 120 (18S;18G;84P)
Requirements: Prerequisites Level 4 and registration in a BCHM Specialization Plan and (a GPA of 2.7 in 12 units of BCHM 218, BCHM313, BCHM315, BCHM316, BCHM317).
Offering Faculty: Faculty of Health Sciences

BCHM 482 Proteomics and Metabolomics Units: 3.00
This course will focus on the principles of proteomics and metabolomics and their application in the new systems biology `omics approach to scientific discovery. This course will emphasize both the methodologies used in proteomics and metabolomics, as well as their applications in both research, medical diagnostics, and disease management.
NOTE: Only offered online. Consult the Bachelor of Health Sciences program office.
LEARNING HOURS may vary: 114 (36O;78P)
Requirements: Minimum 4th year (Level 4) standing and one of {[BCHM 310 or (BCHM 315 BCHM 316)]; [(BCHM 218, BCHM 270, and BCHM 370)]; [(BCHM 310 or (BCHM 315 BCHM 316)), a GPA of 2.5 (registration in a LISC MAJ or SSP Plan)]}.
Offering Faculty: Faculty of Health Sciences

BCHM 594 Independent Study Units: 3.00
Offering Faculty: Faculty of Health Sciences

BCHM 595 Independent Study Units: 6.00
Offering Faculty: Faculty of Health Sciences

BCHM 596 Independent Study Units: 12.00
Offering Faculty: Faculty of Health Sciences

BCHM 799 Introduction To Animal Care Units: 0.00
Offering Faculty: Faculty of Health Sciences

BCHM 800 Introd. To Recomb. Dna Method. Units: 3.00
Offering Faculty: Faculty of Health Sciences

BCHM 820 Adv. Topics In Molecular Biol. Units: 3.00
Discussions and presentations on current topics in molecular biology. The emphasis will be on mammalian systems and will cover a wide range of topics relating to recent advances in molecular biology. Typical topics include gene regulation, replication, DNA repair, forensic analysis, human genomics and genetics. Marks are based on student presentations and essays typically in "News and Views" or Mini-Review formats. Three hours per week, presentations and discussions of original papers. Fall; C. Mueller.
Offering Faculty: Faculty of Health Sciences

BCHM 822 Mechanisms Of Metabolic Cont. Units: 3.00
Lectures and discussions on mechanisms of metabolic control. Recent research on a wide range of specific metabolic systems is examined critically. Emphasis is placed on biochemical factors and principles which play a role in the integration and control of metabolism. Lectures and seminars, three hours per week; Winter; Alternate years.
Offering Faculty: Faculty of Health Sciences

BCHM 823 Advances in Protein Structure & Function Units: 3.00
This course consists of weekly presentations and discussions of recent advances towards the understanding of protein structure and function. Topics of discussion include novel approaches, techniques and concepts in the discovery of protein functions. Students will develop skills in literature research, critical evaluation of published work, effective presentation and discussion of papers.A specific theme, such as cell motility, may be used to illustrate research approaches employed to study biological systems in general. Three lecture hours per week; Winter; Alternate years;A. Mak.
Offering Faculty: Faculty of Health Sciences

BCHM 828 Biochemistry Research Project Units: 3.00
This course is intended to provide the student with the opportunity to gain familiarity with their research field. Students will review the literature related to their proposed graduate research thesis project and write a series of essays on topics selected in consultation with their supervisor; these will be evaluated by a supervisory committee consisting of their supervisor and two other faculty members. They will also develop a written draft research proposal that will be presented to their supervisory committee and defended in a final oral examination. This course is not mandatory but is highly recommended to be taken by students in the first full term of the graduate program. G.P. Côté (course coordinator).
Offering Faculty: Faculty of Health Sciences

BCHM 830 Biochemistry Sem. Pgm-M.Sc. Units: 6.00
Offering Faculty: Faculty of Health Sciences

BCHM 841 Current Topics In Biochem I Units: 3.00
This course will focus on protein structure and function with special emphasis on membrane proteins and selected soluble protein systems. The course will consist of lectures and presentations that will be organized around specific readings from the recent literature. A portion of the course will be devoted to membrane protein structure and function. Selected examples of structural and functional studies of soluble proteins will include enzymes and inhibitors; protein-protein interactions; protein engineering; high-throughput identification of enzyme substrates. Some instruction will be given in homology modeling and database analysis of gene products. Three hours per week, half course lectures and seminars.
Offering Faculty: Faculty of Health Sciences

BCHM 928 Biochemistry Research Project Units: 3.00
Offering Faculty: Faculty of Health Sciences

BCHM 930 Biochemistry Seminar Pgm.-Ph.D Units: 6.00
Course Equivalencies: BCHM 930; BCHM930B
Offering Faculty: Faculty of Health Sciences

BCHM 999 Ph.D. Thesis Research Units: 6.00
All courses are half-courses which are offered either in the fall or winter term if there is sufficient student interest. Detailed outlines of course content are available during the summer of each year. Most courses are offered in alternate years.
Offering Faculty: Faculty of Health Sciences

CANC 380 Evolutionary Biology of Cancer Units: 3.00
This online course is designed to introduce students to cancer as an evolutionary problem. The material is unique in that it emphasizes the impact of the immune system in fighting cancer while at the same time shaping tumour cell evolution. Students will need to synthesize the impact of factors present in the tumour microenvironment.
NOTE Also offered online.
LEARNING HOURS may vary 120 (72O;48P)
Requirements: Minimum 3rd year (Level 3) standing and one of (MICR 270/3.0; MICR 360/3.0; MICR 386/3.0) and one of (BCHM 270/3.0; BCHM 218/3.0).
Offering Faculty: Faculty of Health Sciences

CANC 440 Cancer Biology and Therapeutics Units: 3.00
A consideration of current knowledge and theories about the biology and treatment of cancer. The course will be presented in a small group format, with active student participation required.
NOTE Priority to students in the LISC Specialization Plan, CANC Sub-Plan.
Requirements: Prerequisite Level 4 and (registration in a LISC or BCHM Major or Specialization Plan) and either [(a grade of B in BCHM 310 or BIOL 334) or (a GPA of 3.0 in BCHM 315 and BCHM 316)].
Offering Faculty: Faculty of Health Sciences

CANC 497 Current Topics in Cancer Biology and Genetics Units: 3.00
A seminar-based discussion of topics relevant to cancer research. This course will be run as a companion to CANC 499/12.0, and will incorporate the practical experience students gain in that course as one foundation of learning. Students will also be introduced to other relevant practical aspects of cancer research, including critical analysis of current literature, and the presentation of scientific results. The course will also involve attending and discussing a number of research seminars offered throughout the year.
LEARNING HOURS 120 (36S;12G;72P)
Requirements: CANC499
Offering Faculty: Faculty of Health Sciences

CANC 499 Research Project in Cancer Biology and Genetics Units: 12.00
A research project involving the study of cancer biology or genetics. The project will be supervised by a faculty member associated with the Cancer Research Institute, and will provide opportunities for experimental design, data analysis and both written and oral presentation of results. Students must contact a potential faculty supervisor in the Spring preceding registration in fourth year. Enrolment is limited; acceptance by a supervisor required prior to registration.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in the LISC Specialization Plan (CANC Sub-Plan) and a cumulative GPA of 2.50 or higher. Exclusion ANAT 499; EPID 499; LISC 499; MICR 455; MICR 499; NSCI 499; PATH 499; PHAR 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

CRSS 453 Principles in Cardiorespiratory Science I Units: 3.00
An advanced organ systems approach to the physiological principles underlying cardiac function and oxygen delivery using lectures, seminars, and selected readings. Topics include mechanics and regulation of heart function as well as perturbations in cardiac function. Oxygen delivery and utilization will be examined at the levels of the lung, blood, and tissue. The responses to alterations in oxygen demand and/or supply will also be addressed. Obstructive sleep apnea will be used as a model of a pathological cardiorespiratory system interactions.
NOTE Priority given to students in the CRSS Sub-Plan.
Requirements: Prerequisite Level 4 and Registration in a LISC Major or Specialization Plan and a GPA of 2.5 and [(PHGY 215 and PHGY 216) or PHGY 214 or PHGY212].
Offering Faculty: Faculty of Health Sciences

CRSS 454 Cardiovascular Sciences Units: 3.00
A study of the physiology, pharmacology and anatomy of the cardiovascular system. Topics include integrative mechanisms of control and pharmacotherapy involved in short-term and long-term control of the circulation in health and disease.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office.
LEARNING HOURS may vary: 138 (18L;10S;10G;100P)
Requirements: Minimum 4th year (Level 4) standing and (registration in a LISC or BCHM MAJ or SSP Plan or BHSc program) and a GPA of 2.50. Exclusion LISC 454.
Course Equivalencies: CRSS454; LISC454
Offering Faculty: Faculty of Health Sciences

CRSS 456 Molecular and Cellular Basis of Cardiovascular Disease Units: 3.00
An intensive course surveying the molecular and cellular mechanisms underlying the pathophysiology of the major cardiovascular diseases, and the current and emerging tolls used in their diagnosis and treatment. Alterations in signalling, metabolism, and structure and function will be discussed to present an integrative view of how cardiovascular diseases develop and progress.
NOTE Priority given to students in the CRSS Sub-Plan.
Requirements: Prerequisite Level 4 and Registartion in a LISC Major or Specialization Plan and a GPA of 2.5 and [(PHGY 215 and PHGY 216) or PHGY 214 or PHGY 212 or PHGY 210].
Offering Faculty: Faculty of Health Sciences

CRSS 498 Cardiorespiratory Rounds Units: 3.00
An advanced course in which students attend cardiology and respirology rounds in the Department of Medicine and prepare written and oral reports based on the material presented. The course will provide students with an in-depth exposure to topics in clinical cardiorespiratory science. The course will be offered in alternate years.
NOTE Priority given to students in the CRSS Sub-Plan.
Requirements: Prerequisite Level 4 and Registartion in a LISC Major or Specialization Plan and a GPA of 2.5 and [(PHGY 215 and PHGY 216) or PHGY 214 or PHGY 212 or PHGY 210].
Offering Faculty: Faculty of Health Sciences

DDHT 459 Principles of Drug Discovery Units: 3.00
Advanced study of the early stage components involved in the complex process of drug development including target identification, design and synthesis, structure activity relationships, in vitro and in vivo efficacy determination, biochemical and biological optimization.
NOTE Priority given to students in the LISC Specialization Plan, DDHT Sub-Plan.
LEARNING HOURS 120 (12L;24G;84P)
RECOMMENDATION PHAR 416/3.0.
Requirements: PRE PHAR 340 or PHAR270 Excl No more than 3.0 units from DDHT459; PHAR480
Offering Faculty: Faculty of Health Sciences

DDHT 460 Principles of Drug Development Units: 3.00
Advanced study of the component parts of the complex process of drug discovery and development and the assessment of human toxicology including drug delivery and formulation, directed toxicology studies, drug disposition, clinical trials, legal issues and regulatory approval.
NOTE Priority given to students in the LISC Specialization Plan, DDHT Sub-Plan.
LEARNING HOURS 120 (36L;84P)
RECOMMENDATION DDHT 459/3.0 and PHAR 416/3.0.
Requirements: Prerequisite PHAR 270 or PHAR 340 or PHAR 416 Recommendation DDHT 459 and PHAR 416
Offering Faculty: Faculty of Health Sciences

EPID 206 Adv. Methods In Epidemiology Units: 3.00
Offering Faculty: Faculty of Health Sciences

EPID 301 Principles of Epidemiology Units: 3.00
Basic methods involved in researching the distribution and determinants of health/disease in populations. Core principles of epidemiology are examined, as are the various epidemiological approaches to study design. The latter include descriptive (cross-sectional and ecological), observational (case-control and cohort), and experimental (randomized controlled trials) approaches.
Requirements: Prerequisite BIOL243; CHEE209; COMM162; ECON250; GPHY247; KNPE251; NURS323; PHED251; POLS385; PYSC202; SOCY211; STAM200 STAT263; STAT267; STAT269; STAT367. Exclusion No more than 3.0 units from EPID301; HLTH323; BMED270
Offering Faculty: Faculty of Health Sciences

EPID 401 Biostatistical Data Analysis for Life Science Students Units: 3.00
An applied statistics course covering practical topics in tests and confidence intervals for single and multiple samples, ANOVA, linear regression, correlations, methods for categorical data, and nonparametric methods. The lab uses statistical software. The course emphasizes analyzing data arising in life sciences using practical statistical methods.
Requirements: Prerequisite COMM 162; ECON 250; PYSC 202; SOCY 211; STAM 200; STAT 263; STAT 267; STAT 367 and (Level 4 and registration in a LISC Major or Specialization Plan) and (a GPA of 2.5).
Offering Faculty: Faculty of Health Sciences

EPID 499 Research Project in Epidemiology Units: 12.00
An examination of an epidemiological research question chosen by the student with guidance from the supervisor. Project will involve review of the literature, development of a proposal, data collection and/or processing, data analysis, a written report and oral presentation. Students will be required to attend and report on seminars of their choosing from a number of venues across campus. Limited enrolment.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in the LISC Specialization Plan and a cumulative GPA of 2.50 or higher and (BMED 270 or EPID 301 or HLTH 323). Corequisite EPID 401. Exclusion ANAT 499; CANC 499; LISC 499; MICR 455; MICR 499; NSCI 499; PATH 499; PHAR 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

EPID 510 History Of Medicine Units: 6.00
Offering Faculty: Faculty of Health Sciences

EPID 512 Stat Methods In Health Res. Units: 1.98
Offering Faculty: Faculty of Health Sciences

EPID 520 Community Hlth & Epidemiology Units: 6.00
Offering Faculty: Faculty of Health Sciences

EPID 522 Stat Methods In Hlth Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

EPID 595 Independent Study Units: 6.00
Offering Faculty: Faculty of Health Sciences

EPID 799 Introduction To Animal Care Units: 6.00
Offering Faculty: Faculty of Health Sciences

EPID 801 Introduction To Epidemiology Units: 3.00
This course provides foundational knowledge on how human evidence relevant to public health is created, assessed, and used, with a focus on epidemiologic methods. Topics include measures of health status; risk factors and associations with health outcomes; study design including descriptive, analytical, and intervention approaches; validity issues; critical appraisal; assessment of causation; ethics; and application of epidemiologic evidence in public health decisions.
Offering Faculty: Faculty of Health Sciences

EPID 802 Foundations in Public Health Units: 3.00
This course provides an overview of theoretical and conceptual foundations of public health. It examines the social determinants of health and population health approaches to promote and protect health. It instils in students an understanding of the historical achievements, core values and ethical frameworks that guide public health action.
Offering Faculty: Faculty of Health Sciences

EPID 803 The Canadian Health System Units: 3.00
The aim of this introductory course is to describe how health services are organized and delivered in Canada. Students who take the course will: 1) understand the inputs, delivery and outputs of the Canadian health system; 2) recognize and explain the factors that influence change in this system; and 3) consider current health policy issues in Canada.
Offering Faculty: Faculty of Health Sciences

EPID 804 Intermediate Epidemiology Units: 3.00
This course deals with advanced methods and issues in the design, conduct, analysis and interpretation of epidemiologic studies. The content focuses on observational study design and analysis, and builds on epidemiologic principles presented in EPID-801. Data analysis will emphasize the application and interpretation of statistical concepts in epidemiologic research. Three term-hours, winter; every year. W. King.
Requirements: EPID801
Offering Faculty: Faculty of Health Sciences

EPID 805 Leading Evidence Informed Action Units: 3.00
The course teaches students to apply theories of leadership and change to the analysis and development of public health actions. Approaches to leading change are reviewed at a variety of levels - self, team, organization, individuals, community, government. Practical examples are drawn from the core programmatic and functional areas of public health practice and exemplify the role of the local heath unit organization in leading change.
Offering Faculty: Faculty of Health Sciences

EPID 806 Applied Research Methods for Program Planning and Evaluation Units: 3.00
This course provides an overview of social research methods and tools to assist students to complete the "evidence to action" program planning and evaluation cycle. Topics covered include: defining the issue, using surveillance data, engaging the community, conducting a stakeholder analysis, survey methods, handling qualitative data, building logic models, choosing indicators, communicating the results, taking action.
Offering Faculty: Faculty of Health Sciences

EPID 807 Economic Evaluation of Healthcare Programs Units: 3.00
This course is designed to allow students to become familiar with different types of economic evaluations in healthcare and when to employ particular types of economic evaluation. Topic covered will include: cost-effectiveness, cost-utility, cost-benefit, budget impact analyses, and policy decision-making. No prior
economics background is required. Three term hours.
Offering Faculty: Faculty of Health Sciences

EPID 810 Controlled Clinical Trials Units: 3.00
This course will cover material relevant to the design and conduct of controlled clinical trials. Design topics will include methods used to achieve unbiased results with improved precision, such as adequate sample size, randomization, blinding, pre- and post-stratification, cross-over designs, placebos and the counting of relevant events. Attention will be given to the problems of conducting multi-centre clinical trials. Topics covered will include drafting of protocols, design of data forms, logistics of data flow, methods of follow-up, data management and quality control, periodic reporting, final data analysis and the production of final reports. Ethical issues and the role of randomized trials in clinical investigation will be discussed. Three term-hours, winter. R. Meyer, D. Tu
Offering Faculty: Faculty of Health Sciences

EPID 815 Independent Study Units: 3.00
Offering Faculty: Faculty of Health Sciences

EPID 817 Foundations Of Cancer Control Units: 3.00
This course is intended for graduate students, clinical fellows and postdoctoral fellows who are engaged or interested in cancer research. The course will focus on concepts and methodological issues central to the conduct of epidemiologic studies of cancer etiology and control. Topics will include: an introduction to basic epidemiologic concepts; biologic and clinical concepts central to the investigation of cancer; study design; clinical epidemiology; molecular epidemiology; and cancer control and prevention. Three term-hours; winter; every year. B.MacKillop.
Offering Faculty: Faculty of Health Sciences

EPID 819 Clinical Epidemiology Units: 3.00
This course will demonstrate the way in which epidemiological principles guide the practice of medicine and the design of clinical research. Topics will include how to select the correct design for a study that addresses a clinical question,how to evaluate the quality of clinical publications and research proposals, and how to prepare a clinical research proposal. Three term hours,Fall every year. W. Mackillop.
Offering Faculty: Faculty of Health Sciences

EPID 821 Essentials of Biostatistics Units: 3.00
This course provides an overview of basic statistical concepts, principles, and techniques essential for public health and epidemiologic research. This course covers both descriptive and inferential statistics. Topics covered include measures of association, t-tests, regression, chi-square tests, analysis of variance, and some nonparametric methods. Emphasis is on understanding and interpreting fundamental statistical analyses from health research.
Offering Faculty: Faculty of Health Sciences

EPID 822 Applied Regression Analysis Units: 3.00
This course deals with the commonly used regression methods proven useful in health services research and the epidemiologic analysis of the relationship between traits, exposures or treatments, and diseases or other medical outcomes. The course emphasizes the statistical modeling approach with topics including multiple regression, analysis of variance and covariance, reliability of measurements, analysis of categorical data, logistic regression, Poisson regression and survival analysis. This course includes a compulsory SAS Programming component. PREREQUISITE: EPID-821* (or permission of instructor for Biostatistics students).
Requirements: EPID821
Offering Faculty: Faculty of Health Sciences

EPID 823 Advanced Methods in Biostatistics Units: 3.00
An advanced course in the theoretical issues and analytical practices in epidemiology, and biostatistics. Topics may vary but major topics include analysis of longitudinal and survival data using various regression models; Techniques and strategies for regression modeling; Novel analytic approaches in epidemiology; multivariate analysis methods including discriminant analysis, principal components and factor analysis. PREREQUISITE: EPID- 821* + knowledge of basic statistical modeling techniques deemed adequate by the Instructors.
Offering Faculty: Faculty of Health Sciences

EPID 826 Determinants Of Health Units: 3.00
This half term course (involving 39 hours of instruction) is required for students enrolled in the Masters of Public Health Program in the Department of Community Health and Epidemiology in the second year of their program. This course examines the determinants of health from a population health perspective including social, cultural, and economic factors; physical environmental factors; personal health practices; individual coping skills; and health services. Three term hours, fall; every year. B. Alvarado-Llano.
Offering Faculty: Faculty of Health Sciences

EPID 827 Pub. Hlth Leadership & Admin. Units: 3.00
This course provides an introduction to public health leadership and administration. The intent is to familiarize with the main components of the organization, financing, and delivery of public health services in Canada. Students will also learn principles of strategic planning, public health marketing, the legal and ethical basis for public health interventions, and systems thinking for resolving community health and organizational problems.Finally, the course will build competencies in critical thinking and communication skills necessary for public health practice. Three term hours; Winter. Duncan Hunter.
Offering Faculty: Faculty of Health Sciences

EPID 828 Infectious Diseases Units: 3.00
This course provides a foundation in infectious disease epidemiology. Principles and methods related to infectious disease biology, outbreak detection and investigation, and the methodological, analytical, and diagnostic tools are covered. Specific infectious diseases that pose contemporary challenges in public health and/or have national or global public health impact are discussed. Three term hours. PREREQUISITE: EPID-801 or permission of the instructor.
Offering Faculty: Faculty of Health Sciences

EPID 829 Foundations of Global Health Units: 3.00
Offering Faculty: Faculty of Health Sciences

EPID 831 Chronic Disease Epidemiology Units: 3.00
This course will provide an overview of the epidemiology of some of the leading non-infectious causes of morbidity and mortality in Canada and will highlight the key methodological considerations for the study of each disease or health problem.
PREREQUISITES: EPID-801* & EPID-821* or equivalents with permission of course coordinator
Offering Faculty: Faculty of Health Sciences

EPID 832 Mental Health/Critical Inquiry Units: 3.00
This course will provide students with in-depth substantive knowledge about the evolution of health issues that have shaped policy and mental health services.
PREREQUISITES: EPID-801* or permission of course instructor
Offering Faculty: Faculty of Health Sciences

EPID 835 Environmental Public Health Units: 3.00
This course provides students with a foundation for understanding, assessing and mediating environmental exposures. Methods for assessing and communicating about exposures, risks and standards in air, water, soil and food are introduced. Case studies of managing hazardous exposures are reviewed. Environmental health policy implications of global climate, energy use and disaster planning are explored. PREREQUISITE: EPID-801, EPID-821 or equivalent, or permission of instructor.
Offering Faculty: Faculty of Health Sciences

EPID 836 Qualitative Health Research Methods Units: 3.00
This course provides foundational instruction in qualitative research methodology for students in the public health sciences, including theoretical basis, study design, research ethics, sampling and recruitment, data collection, data analysis, and disseminating research findings. Topical areas may include ethnography, grounded theory, phenomenology, participatory research, and other areas.
Offering Faculty: Faculty of Health Sciences

EPID 837 Health Services Research Units: 3.00
This course introduces health services research methods as they are applied to routinely collected health data. It covers methodologic approaches for assessing healthcare effectiveness, quality, and access. The course also provides an introduction to the Ontario ICES data holdings and the conduct of health services research using those data.
Offering Faculty: Faculty of Health Sciences

EPID 886 Public Health Professional Development Units: 3.00
This course assists students to lay the foundation for continuing professional development in public health practice. Students are introduced to the personal learning portfolio and coached to chart their progress in developing skills and competencies through a combination of workshops, seminars, and on line learning modules.
Offering Faculty: Faculty of Health Sciences

EPID 887 Practicum Placement Units: 3.00
The 400¿hour practicum placement provides MPH students with an opportunity to work in the public health field and contribute to evidence-informed public health practice. Through the practicum students demonstrate and enhance the knowledge, skills and attitudes they have learned from course work as well as reflect on and advance their career development. Placement activities and roles will vary according to the needs and interests of both host organization and the student. This course is graded on a PASS/FALL basis.
PREREQUISITES: EPID 801, EPID 802, EPID 803, EPID 806, EPID 821 and EPID 886 (16-month students only), or approval from the Practicum Coordinator.
Offering Faculty: Faculty of Health Sciences

EPID 888 Master's Practicum Units: 6.00
Under the guidance of the supervisor, students will carry out a practicum project in a health research group/site and practise biostatistical methods and data analysis, or conduct methodology research in a biostatistical project. Students will summarize the results of the project in a written report that will be reviewed and orally defended.
Offering Faculty: Faculty of Health Sciences

EPID 899 Master's Thesis Units: 6.00
Offering Faculty: Faculty of Health Sciences

EPID 901 Advanced Epidemiology Units: 3.00
This course provides in-depth integration of advanced concepts in epidemiology, with theory and examples, including causation and causal inference, study design and conduct, alternate designs, confounding, effect modification, internal and external validity, misclassification, source populations, statistical power and sample size, epidemiologic data analysis and interpretation, meta-analysis and selected specific research areas. This is an advanced course intended primarily for Ph.D. students. Sessions consist of lectures, seminars, student presentations and discussions. Three term-hours, fall and winter. Patti Groome and Harriet Richardson
Offering Faculty: Faculty of Health Sciences

EPID 902 Advanced Public Health Research Units: 3.00
This course provides a conceptual and historic view of the Public Health Sciences, as well as a look at contemporary issues in Public Health research ethics, research methodology and knowledge translation. Guided each year by student interests and advanced training needs, the course delves into specific substantive public health research areas including for example: chronic disease, environmental health, infectious disease, injury and disability, maternal and child health, occupational health, humanitarian contexts, Indigenous health and/or health services research.
Offering Faculty: Faculty of Health Sciences

EPID 999 Ph.D. Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

LISC 171 Social and Physical Determinants of Health and Disease Units: 3.00
This course will use an evidence-based approach to address the impact of social and environmental exposures and circumstances on health at both an individual and population level.
Requirements: Prerequisite LISC or BCHM plan Exclusion GLPH 171; HLTH 101; HLTH 102; GPHY 339
Offering Faculty: Faculty of Health Sciences

LISC 173 History and Philosophy of Health and Healthcare Units: 3.00
Multidisciplinary course organized around five major fields of scientific endeavour: anatomy, physiology, pathology, pharmacology, and population and global health
Requirements: Prerequisite LISC or BCHM plan Exclusion BMED173; PHIL201
Offering Faculty: Faculty of Health Sciences

LISC 270 Fundamentals of Health Research Methodology Units: 3.00
Introduction to fundamentals of health-related research methods with a focus on developing critical reasoning skills. Using examples from a wide range of health-related research topics, students will gain familiarity and skills to assess primary literature at a basic level.
Requirements: Pre Lvl 2 one from STAT263; BIOL243; STAM200; CHEE209; ECON250; GPHY247; KNPE 251; NURS323; POLS385; PSYC202; SOCY211; STAT267; STAT367; COMM162 or permission from the instructor. Exclusions No more than 3 units in BMED270; SOCY210; GPHY240; LISC270 *Please see 20/21 Courses of Instructions for full exclusion list
Offering Faculty: Faculty of Health Sciences

LISC 271 Global Population and Health Units: 3.00
Emphasis will be placed on population health, instead of the health of individuals. Population and Global health prioritize partnerships and resource sharing, instead of unilateral relationships, and focuses on advocacy.
Requirements: Prerequisite Level 2 and registered in a (LISC or BCHM) plan Exclusion GLPH271
Offering Faculty: Faculty of Health Sciences

LISC 300 The Process of Discovery in the Biomedical Sciences Units: 3.00
Teams of students will identify the critical questions that must be answered to resolve major controversies or gaps of knowledge that impede the application of fundamental principles in the Life Sciences to health care. The end product will be a written report and public presentation that is accessible to a wide audience.
NOTE Restricted to students registered in Level 3 or above in a (LISC Specialization or Major Plan or BCHM Specialization or Major Plan or BIOL Plan or PSYC Plan).
NOTE Limited enrollment available to BIOL and PSYC students.
LEARNING HOURS 126 (6L;6S;33G;33O;48P)
Requirements: PREREQUISITE Level 3 and above and [registration in a LISC or BCHM Honours Plan (LISC-M-BSH; LISC-P-BSH; BCHM-M-BSH; BCHM-P-BSH) or BIOL Plan or PSYC Plan].
Offering Faculty: Faculty of Health Sciences

LISC 322 Fundamentals Of Neuroscience Units: 3.00
Requirements: PHGY212 OR PHGY210 OR PHGY214 OR BIOL338 OR PSYC271
Offering Faculty: Faculty of Arts and Science

LISC 373 Health Ethics, Law and Policy Units: 3.00
Introduction to ethical, legal and regulatory requirements for people working in the health professions.
Requirements: Prerequisite Level 3 and registration in a LISC or BCHM plan Exclusion BMED373
Offering Faculty: Faculty of Health Sciences

LISC 383 Advanced Research Methodologies Units: 3.00
Students will develop an understanding of the three primary types of research employed in health sciences: Experimental quantitative, observational quantitative, and qualitative
Requirements: Prerequisite Lvl 3 registration in a LISC or BCHM plan and (BMED270 or LISC 270 EPID301 or HLTH252 or PSYC203 or SOCY210) or permission of the instructor Exclusion BMED383
Offering Faculty: Faculty of Health Sciences

LISC 385 Biohacking and Gerontechnology Units: 3.00
Examines technologies that are in use/evolving in the aging support and anti-aging arsenal, including gerontechnology and anti-aging technologies.
Requirements: Prerequisite Level 3 and registraion in a LISC or BCHM plan or permission from the instructor. Exclusion GLPH385
Offering Faculty: Faculty of Health Sciences

LISC 390 Integrated Life Science Laboratory I Units: 3.00
Students will learn a number of different laboratory techniques, developing skills in scientific methodology, data acquisition, and interpretation. Students will also attain skills in critical thinking and hypothesis development, as well as gain experience in writing a laboratory report, and participating in research presentations.
NOTE Priority will be given to students registered in a LISC Specialization Plan.
Requirements: Prerequisite PHGY 210 or PHGY 214 or [PHGY 215 and PHGY 216]; PHAR 230 or PHAR 270 or PHAR 340 or LISC 391 Exclusion No more than 3.0 units from LISC390; BMED 384
Offering Faculty: Faculty of Health Sciences

LISC 391 Integrated Life Sciences Laboratory Units: 3.00
An intermediate laboratory course on the Physiology and Pharmacology of Cardiorespiratory Sciences and Neuroscience. Students develop skills to acquire and evaluate data and methods. Critical thinking skills are used for the development of arguments, assumptions, and information required to evaluate concepts and hypotheses.
NOTE Priority will be given to students registered in a LISC Specialization Plan.
LEARNING HOURS 108 (36Lb;36O;36P)
Requirements: Prerequisite (PHGY 215 and PHGY 216) or PHGY 210 or PHGY 214. Exclusion BMED384
Offering Faculty: Faculty of Health Sciences

LISC 426 Current Concepts in Sensorimotor Neuroscience Units: 3.00
A multi-disciplinary course exploring advanced concepts of sensorimotor integration from a systems neuroscience perspective. Topics include the neural basis of perception, action selection, reinforcement learning, and motor control. Students will learn to critically evaluate scientific literature and present these concepts to classmates.
Requirements: PREREQUISITES Level 4 and NSCI 322/3.0 or LISC 322/3.0 or NSCI 323/3.0 or NSCI 324/3.0 and reg. in LISC Major or Spec. Plan and (a GPA of 2.5)
Offering Faculty: Faculty of Health Sciences

LISC 471 Advanced Global and Population Health Units: 3.00
Students will take knowledge gained from GLPH 271/3.0 or LISC 271/3.0, and apply it in this course, which will focus on more advanced topics of population and global health, as well as provide experiential learning.
Requirements: Prerequisite Level 4 and registration in a LISC or BCHM plan and (LISC 271 or GLPH 271) or permission of instructor. Exclusion GLPH 471
Offering Faculty: Faculty of Health Sciences

LISC 483 Advanced Topics in Infectious Disease Units: 3.00
This course examines basic principles of infectious diseases, including epidemiology, pathophysiology, transmission, and control of infectious agents, with an emphasis on antimicrobial therapy and resistance.
Requirements: Prerequisite Level 4 and registration in a LISC or BCHM plan and one of (MICR 320; MICR 270; MICR 271; MICR 221), or permission from the instructor. Exclusion BMED 483/3.0
Offering Faculty: Faculty of Health Sciences

LISC 493 Global Health Practice Units: 3.00
This course will strengthen students¿ abilities to respond to a community¿s health needs through a practical service learning position with an approved local or international community health organization
Requirements: Prerequisite Level 4 and registration in a LISC or BCHM plan and GLPH271 Exclusion GLPH493
Offering Faculty: Faculty of Health Sciences

LISC 594 Independent Study Units: 3.00
Offering Faculty: Faculty of Health Sciences

LISC 595 Independent Study Units: 6.00
Offering Faculty: Faculty of Health Sciences

LISC 596 Independent Study Units: 12.00
Offering Faculty: Faculty of Health Sciences

LISC 598 Independent Study Units: 9.00
Offering Faculty: Faculty of Health Sciences

MICR 121 Microbiology for Nursing Students Units: 3.00
This course provides the student with a foundation in the subdisciplines of bacteriology, virology, parasitology, and immunology. The course is designed to examine common infectious diseases through a body-systems approach. Laboratory and tutorial sessions emphasize diagnostic microbiology.
Requirements: BCHM010 OR BCHM102
Offering Faculty: Faculty of Health Sciences

MICR 125 Micr For Health Sciences Units: 3.00
Offering Faculty: Faculty of Health Sciences

MICR 160 Immunology for Today Units: 3.00
A general course providing insight into the role immunology plays in health and disease. Social and political issues associated with the increasing importance of this field will be discussed. Topics will include vaccines, immune system stimulators, organ transplants, allergies, cancer, AIDS, rheumatoid arthritis and diabetes. Offered in Spring Term only.
NOTE The course has been designed primarily for students in the humanities, social sciences and non-biological sciences. No previous training in science is required.
Requirements: MICR221; 229; 360; 461 Ex
Offering Faculty: Faculty of Health Sciences

MICR 221 Basic Microbiology Units: 3.00
A fundamental study of the structure and growth of microorganisms and viruses. The roles of microbes in aquatic, terrestrial and human environments will be considered.
LEARNING HOURS 120 (36L;18Lb;66P)
Requirements: PREREQUISITE (A GPA of 1.90 (obtained in any term) or a `Pass¿ (obtained in Winter 2020) in BIOL 102/3.0 and BIOL 103/3.0) and CHEM 112/6.0. EXCLUSIONS MICR 271/3.0
Course Equivalencies: MICR221, MICR229
Offering Faculty: Faculty of Health Sciences

MICR 270 Infection, Immunity and Inflammation Units: 3.00
This course focuses on 1) the overall organization of the immune system, 2) the role of the immune system in combating diseases caused by common pathogens as well as adverse reactions of the immune system and 3) application of the basic knowledge of immunology to the field of infectious disease prevention and control by vaccines and treatment of cancer. The unique features of this course lie in its overall structure and delivery that will prepare the student for further in-depth learning in the field of immunology.
NOTE This online course in infection and immunity is designed for students from various biological sciences and allied health backgrounds at all levels of post-secondary education and is recommended as a foundation course for students pursuing a life sciences career.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office.
NOTE May not be taken for credit towards the Plan requirements of the LISC Specialization or Major Plans.
LEARNING HOURS may vary 114 (36O;78P)
Requirements: Minimum 2nd year (Level 2) standing and one of (BIOL 102/3.0; MICR 121/3.0; PHGY 170/3.0). One-way Exclusion May not be taken with or after MICR 360/3.0; MICR 386/3.0; BMED 386.
Offering Faculty: Faculty of Health Sciences

MICR 271 Introduction to Microbiology Units: 3.00
An introduction to the biology of microbes, including both pathogenic & beneficial bacteria, viruses, fungi, & protozoa. This overview of the biological features of these microorganisms will highlight these organisms¿ roles in the environment & in human health contributing to infectious diseases vs. maintaining healthy microbiomes.
NOTE Only offered online. Consult the Bachelor of Health Sciences Program office.
LEARNING HOURS 120 (60O;60P)
Requirements: Minimum 2nd year (Level 2) standing and one of (PHGY 170/3.0; BIOL 102/3.0). Exclusion MICR 221/3.0
Offering Faculty: Faculty of Health Sciences

MICR 290 Antibiotic Resistance Lab Units: 3.00
This immersive laboratory course is designed to give students the opportunity to apply important microbiological and biochemical research techniques to the study of antibiotic resistance. Students work in small groups on a semester-long project, developing valuable lab skills that will support them with future research
opportunities.
LEARNING HOURS 120(36Lb;48O;36P)
Requirements: Minimum 2nd year (Level 2) standing, registration in a BHSc, LISC, or BCHM degree plan, and one of (MICR 270/3.0; MICR 271/3.0) Exclusion MICR 221/3.0
Offering Faculty: Faculty of Health Sciences

MICR 320 Microbes in Health and Disease Units: 3.00
This course will focus on the roles of microbes in health (human microbiome) and disease (pathogens). The molecular mechanisms of bacterial/viral virulence and the host response will be examined in order to develop an in depth understanding of the etiology of infectious diseases and the benefits derived from the human microbiome. Consult the Bachelor of Health Sciences program office
NOTE Also offered online. Learning Hours may vary.
Requirements: Minimum 3rd year (Level 3) standing and one of (MICR 221/3.0; MICR 271/3.0; MICR 229/3.0) and one of (MICR 360/3.0; MICR 386/3.0; BMED 386/3.0). Exclusion MICR 382/3.0
Offering Faculty: Faculty of Health Sciences

MICR 360 Immunology Units: 3.00
The general principles and mechanism of immune reaction. Immunochemical and immunobiological aspects of antibody formation and cell-mediated immunity in health and disease will be considered.
LEARNING HOURS 144 (36L;36O;72P)
Requirements: Prerequisite MICR221 or MICR271
Offering Faculty: Faculty of Health Sciences

MICR 386 Fundamentals of Immunology in Health and Disease Units: 3.00
Integrates the key principles of immunology to facilitate learning of immunology as it relates to human health and disease. This course offers real-life case studies, problems encountered and solutions applied, immunology virtual laboratory simulation, and extensive coverage of the basic science underlying each topic in the module.
Also offered online.
LEARNING HOURS may vary:120(48O;72P)
Requirements: Minimum 3rd year (Level 3) standing and one of (BCHM 218/3.0; BCHM 270/3.0), and one of (MICR 270/3.0; MICR 271/3.0; MICR 221/3.0). Exclusion MICR 360/BMED 877
Offering Faculty: Faculty of Health Sciences

MICR 433 Microbial Diversity Units: 3.00
An emphasis on the wide variety of bacteria and their habitats focusing on their physiology, metabolism, genetics and their influence on the environment. The laboratory component will feature enrichments for selected groups of microorganisms and analysis of isolates by light microscopy, gas and high pressure liquid chromatography etc. (0/54/0/0/0)~ COURSE DELETED IN 2008/09 ~
Offering Faculty: Faculty of Health Sciences

MICR 435 Advanced Procaryotic Structure and Function Units: 3.00
An in-depth analysis of the genetics, biochemistry, assembly and function of the major structures of the procaryotic cell. Emphasis on the experimental approaches in the current literature.
Requirements: PREREQUISITES BIOL 205/3.0 and (MICR 221/3.0 or MICR271 or MICR 229/3.0 with a minimum grade of B-) and reg in the LISC Major or Spec. Plan) and (a GPA of 2.5). COREQUISITE BCHM 310/6.0 or BCHM 315/3.0 or BIOL 334/3.0.
Offering Faculty: Faculty of Health Sciences

MICR 436 Microbial Genetics Units: 3.00
A detailed description of the processes of heredity in bacteria including a discussion of gene structure and evolution, gene expression and its control, the exchange of genetic material in the microbial world and genetic engineering and its applications. The laboratory component will emphasize modern approaches to genetic engineering.
NOTE Offered in alternate years to MICR 435/3.0.
Requirements: PREREQUISITES BIOL 205/3.0 and (MICR 221/3.0 or MICR227 or MICR 229/3.0 with a minimum grade of B) and (reg in the LISC Major or Spec. Plan) and (a GPA of 2.5). COREQUISITE BCHM 310/3.0 or BCHM 315/3.0 or BIOL 334/3.0.
Offering Faculty: Faculty of Arts and Science

MICR 450 Principles of Molecular Virology Units: 3.00
Further study of contemporary virology, using the textbook as a guide to particles, genomes, replication, expression, infection and pathogenesis. Emphasizing reading and writing to develop skills in observation and critical thinking, important attributes in understanding the scientific method.
NOTE Offered in alternate years to MICR 451/3.0.
Requirements: PREREQUISITES BIOL 205/3.0 and (MICR 221/3.0 or MICR271 with a minimum grade of B-) and (Level 4 and registrationin the LISC Major or Spec. Plan) and (a GPA of 2.5). COREQUISITE BCHM 310/6.0 or BCHM 315/3.0.
Offering Faculty: Faculty of Arts and Science

MICR 451 Selected Topics in Viral Pathogen Units: 3.00
The nature of selected animal virus groups and their interactions with the host in disease production. Special emphasis on the pathogenesis of tumour and human immunodeficiency viruses.
NOTE Offered in alternate years to MICR 450/3.0.
LEARNING HOURS 120 (24L;12T;84P)
Requirements: PREREQUISITES Level 3 or above and (reg in the BIOL or LISC Major or Specialization plan) and (a GPA of 2.5) and (BCHM218 or MBIO218 with a min. grade of B-) or (BIOL330 with a min grade of B-) or (BIOL331 with a min grade of B-).
Offering Faculty: Faculty of Health Sciences

MICR 452 Viral Infection and Immunity Units: 3.00
Course material will focus on the molecular basis for virus pathogenesis including host immune responses to virus infection, and viral countermeasures. Emphasis will be on viral infections that result in gastrointestinal, haematological, neurological, and respiratory diseases. Tutorials will focus on discussion of current and seminal literature.
Requirements: PREREQUISITES Level 4 and (registration in the LISC Major or Specialization Plan) and (a GPA of 2.5) and (MICR221 or MICR271) and MICR360.
Offering Faculty: Faculty of Health Sciences

MICR 455 Practicum in Virology Units: 6.00
In-depth analysis of experimental approaches for the study of insect viruses in cell culture and practical hands-on laboratory experience through a research project.
Requirements: (MICR221 AND BIOL205) OR (MICR221 AND MBIO318)
Offering Faculty: Faculty of Health Sciences

MICR 461 Advanced Immunology Units: 3.00
Advanced immunology course focused on current topics in immunology and immunology-related scientific research.
Requirements: PREREQUISITE (MICR 360/3.0 with a minimum grade of A-) and (Level 4 and registration in the LISC Major or Specialization Plan) and (a GPA of 2.5)
Offering Faculty: Faculty of Health Sciences

MICR 499 Research Project in Microbiology and Immunology Units: 12.00
A research project supervised by and closely related to the research program of a faculty member. The research project involves experimental design, data collection and analysis, written report and oral presentation. Students will be required to attend seminars and tutorials on topics related to research. Limited enrolment.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in a LISC or ELSC Specialization Plan and cumulative GPA of 2.50 or higher and MICR 221. Exclusion ANAT 499; CANC 499; EPID 499; LISC 499; MICR 455; NSCI 499; PATH 499; PHAR 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

MICR 836 Microbial Genetics Units: 3.00
A detailed description of the processes of heredity in bacteria including a discussion of gene structure and evolution, gene expression and its control, the exchange of genetic material in the microbial world and genetic engineering and its applications. The laboratory component will emphasize modern approaches to genetic engineering. (Offered in alternate years to MICR-835* and concurrently with MICR-436* with additional work required.) Winter term, two hours lecture, one hour tutorial. Not Offered 2010-2011.
Requirements: MICR836 excludes MICR436
Offering Faculty: Faculty of Health Sciences

MICR 850 Molecular Virology Principles Units: 3.00
Further study of contemporary virology using the textbook as a guide to particles, genomes, replication, expression, infection, and pathogenesis. Emphasizing reading and writing to develop skills in observation and critical thinking, important attributes in understanding the scientific method. (Offered in alternate years to MICR-851* and concurrently with MICR-450* with additional work required.) Fall term, three lecture hours, three seminar hours. E. Carstens. Not Offered 2010-2011.
Requirements: MICR850 excludes MICR450
Offering Faculty: Faculty of Health Sciences

MICR 860 Immunology Units: 3.00
The general principles and mechanisms of immune reaction. Immunochemical and immunobiological aspects of antibody formation and cell-mediated immunity in health and disease will be considered. (Offered concurrently with MICR-360* with additional work required.) Fall term, three lecture hours. M. Szewczuk
Requirements: MICR860 excludes MICR360
Offering Faculty: Faculty of Health Sciences

MICR 899 Master's Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

MICR 910 Microbiol/Immun Seminar Course Units: 3.00
A required course for all graduate students entering a MSc or PhD from a BSc. Credit will be based upon attendance and participation in the weekly departmental seminar program and on attendance at all Visiting Speaker/Departmental seminars. In addition, each student will be required to present two seminars based upon his/her research work. Departmental faculty will provide evaluation of each student presentation consisting of a mark and written comments. A final mark will be compiled by the Graduate Program Coordinator (40%, first seminar; 60% second seminar). Fall and winter terms, seminar. N. Martin.
Offering Faculty: Faculty of Health Sciences

MICR 920 Microbial Pathogenesis Units: 3.00
A comprehensive course emphasizing the major microbial and viral groups occurring in human and animal disease. The basic mechanisms involved in host-parasite interrelationships as well as current effective methodology used in their control will be studied. Winter term. N. Martin.
Offering Faculty: Faculty of Health Sciences

MICR 930 Advanced Bacteriology Units: 3.00
An integrated course dealing with microbial physiology as approached from biochemical, genetic and ecological perspectives. The course will also stress microbial diversity. Fall term. Three lecture hours. K. Poole.
Offering Faculty: Faculty of Health Sciences

MICR 950 Advanced Virology Units: 3.00
Advanced general virology with a special emphasis on virus structure, replication patterns under permissive conditions and in persistent infections. Molecular aspects of gene duplication, expression and modulation are emphasized, as well as a consideration of viruses as expression vectors. Fall term. Three lecture hours. L. Raptis. Not Offered 2010-2011.
Offering Faculty: Faculty of Health Sciences

MICR 960 Advanced Immunology Units: 3.00
An advanced course emphasizing the main areas of contemporary immunology. Fall term. S. Basta.
Offering Faculty: Faculty of Health Sciences

MICR 970 Research Project In Microbiol. Units: 3.00
A required course for all graduate students entering a Master¿s program and for those entering a doctoral program without a prior Master¿s of Science degree. Students will complete essays on central questions related to their research program. The intent of this course is to promote an early appreciation of the literature and/or experimental approaches germane to the student¿s proposed studies and/or address weaknesses/gaps in the student¿s prior studies that might impede his/her undertaking the proposed work. Offered all terms. K. Poole.
Offering Faculty: Faculty of Health Sciences

MICR 999 Ph.D. Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

NSCI 323 Cellular Neuroscience Units: 3.00
Fundamental properties of the nervous system. Emphasis placed on the properties of neurons that are fundamental to neuron-to-neuron communication, the formation of neural circuits, and the repair of the nervous system following injury. Tutorials introduce techniques and neurological problems that illustrate principles of neural function.
Requirements: Prerequisite BIOL 339 or KNPE 125 or KNPE 225 or (PHGY 215 and PHGY 216) or PSYC 271 or PHGY 210 or PHGY 212 or PHGY 214
Offering Faculty: Faculty of Health Sciences

NSCI 324 Systems Neuroscience Units: 3.00
Fundamental properties of the nervous system. Emphasis placed on the properties of neurons and neural circuits that underlie behaviour and cognitive functions within selected neural systems, such as sensory, motor, reward, and autonomic systems. Tutorials introduce techniques and neurological problems that illustrate principles of neural function.
Requirements: Prerequisite (PHGY 215/3.0 and PHGY 216/3.0) or PSYC 271/3.0 or NSCI 323/3.0 or PHGY 210/6.0 or PHGY 212/6.0 or PHGY 214/6.0.
Offering Faculty: Faculty of Health Sciences

NSCI 401 Introduction to Theoretical Neuroscience Units: 3.00
This course will provide an introduction to the main modelling approaches and theoretical concepts in Neuroscience. The computational anatomy of the brain and how it implements perception, learning, memory, decision making and motor control, among other topics, will be discussed.
RECOMMENDATION NSCI 323/3.0, NSCI 324/3.0, ANAT 312/3.0, PSYC 271/3.0.
Requirements: Prerequisite STAT263; STAT 267; STAT 367; COMM 162; ECON 250; PSYC 202; SOCY 211; BIOL 243; CHEE 209; GPHY 247; KNPE 251; POLS 385; NURS 323 and Level 4 in a LISC Maj or Spec Plan and a GPA of 2.5
Offering Faculty: Faculty of Health Sciences

NSCI 403 Introduction to Neuroimaging Units: 3.00
This course covers the theory and practice of modern neuroimaging methods. Topics include data acquisition, research study design, and analysis methods. Functional MRI is presented in the most depth, but computed tomography (CT), positron emission tomography (PET), and single photon emission computed tomography (SPECT), are also covered.
LEARNING HOURS 120 (36L;84P)
Requirements: Prerequisite Level 4 and (registration in a LISC Major or Specialization Plan) and (a GPA of 2.5) and one of (NSCI323 or NSCI324 or ANAT312 or PSYC271 or PSYC 370).
Offering Faculty: Faculty of Health Sciences

NSCI 414 Progress in Neuroanatomy and Neuropharmacology Units: 3.00
A contemporary and comprehensive assessment of the neurochemical anatomy and neuropharmacology of the mammalian and human nervous systems as they relate to development, function and disease. Topics will include dynamics of neurotransmitter interactions, neuronal drug receptor interactions and second messengers, neurotoxicity associated transmitters and neural growth factors.
NOTE BMCO students should contact the Department regarding prerequisites.
Requirements: Prerequisites A grade of B- in (ANAT312 or NSCI 323 or PHAR 340) and (a GPA of 2.5). Corequisite NSCI 324.
Offering Faculty: Faculty of Health Sciences

NSCI 422 Cellular and Molecular Neuroscience Units: 3.00
A course providing 1) the essentials in cellular and molecular neuroscience to pursue a graduate program and/or a career in neuroscience or related field, and 2) independent learning and communication skills applicable broadly. The course is divided into three segments: 1) neuronal integration, 2) synaptic plasticity, and 3) neuromodulation.
NOTE BMCO students should contact the Department regarding prerequisites.
LEARNING HOURS 119 (12L;24S;8G;6I;69P)
Requirements: Prerequisite A grade of B in NSCI 323 and (Level 4 and registration in the LISC Major or Specialization Plan) and (a GPA of 2.5)
Offering Faculty: Faculty of Health Sciences

NSCI 429 Disorders of the Nervous System Units: 3.00
A multi-disciplinary course exploring advanced concepts of clinical neuroscience. Topics include stroke, traumatic brain and cord injuries, neurodegenerative disorders, epilepsy, schizophrenia, depression, deep brain stimulation, pain and placebo effects, normal and abnormal aging, stem cells. Students will learn to critically evaluate scientific literature and present these concepts to classmates during student-led seminars. Restricted to fourth-year students. Enrollment is limited.
Requirements: PREREQUISITE NSCI 322/3.0 or NSCI 323/3.0 or NSCI 324/3.0 or ANAT 312/3.0 and Level 4 and (registration in a LISC Major or Specialization Plan) and (a GPA of 2.5)
Offering Faculty: Faculty of Health Sciences

NSCI 433 Cellular Elements of the Nervous System: Responses to Injury and Disease Units: 3.00
Cellular dysfunction is a critical feature of neural injury and disease among humans. This course will examine the cellular elements of the mammalian central and peripheral nervous system, with an emphasis placed on understanding normal and abnormal cellular function in both humans and animal models.
NOTE Restricted to students registered in the 4th year.
LEARNING HOURS 114 (36L;36Lb;42P)
Requirements: Prerequisite (NSCI323 or NSIC324) and (ANAT309 or ANAT312) and (a GPA of 2.5) and registration in a LISC Major or Specialization Plan.
Offering Faculty: Faculty of Health Sciences

NSCI 444 Controversies in Neuroscience Units: 3.00
As insight regarding the human brain expands, so do related issues such as what constitutes personhood, what drives the criminal mind, intelligence-enhancing drugs and end-of-life issues. Lead by experts who deal daily with such concerns, we will focus weekly on a particular topic in neuroscience which impacts on society.
LEARNING HOURS 108 (12L;24S;72P)
Requirements: PREREQUISITE NSCI 322/3.0 or NSCI 323/3.0 or NSCI 324/3.0 or ANAT 312/3.0 and Level 4 and (registration in a LISC Major or Specialization Plan) and (a GPA of 2.5)
Offering Faculty: Faculty of Health Sciences

NSCI 483 Neurobiology of Learning and Memory Units: 3.00
An exploration of brain systems underlying how the we learn and remember, and how they become disordered. Online multimedia modules and study of cutting edge research articles reveal how modern techniques and ideas are driving neuroscience forward. Requires interviewing a person with a disorder in order to learn to advocate for them in society.
Requirements: Minimum 4th year (Level 4) standing and one of [(PHGY 215/3.0 and PHGY 216/3.0); PSYC 271/3.0; PHGY 214/6.0; PHGY 210/6.0]. For LISC and BCHM Honours students Level 4 and registration in a LISC or BCHM Major or Specialization Plan and a GPA of 2.5
Offering Faculty: Faculty of Health Sciences

NSCI 491 Directed Special Laboratory Units: 3.00
Laboratory course in a selected area of Neuroscience to be arranged in consultation with individual members of the Centre for Neuroscience Studies. Course involves experimental design, data collection and analysis (approximately 6 hours of laboratory work per week required) as well as a brief communication of the laboratory work.
NOTE Students are limited to one NSCI 491/3.0 research project in Year 4.
NOTE Students whose research project requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
Requirements: BSCH SSP LISC NSCI
Offering Faculty: Faculty of Health Sciences

NSCI 499 Research Project in Neuroscience Units: 12.00
An investigation into a selected area of neuroscience.
The research project involves experimental design, data collection, and analysis, written report and oral presentation. Students will be required to attend seminars and tutorials on topics related to research. Limited enrolment.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in a LISC Specialization and a cumulative GPA of 2.50 or higher. Exclusion ANAT 499; CANC 499; EPID 499; LISC 499; MICR 455; MICR 499; PATH 499; PHAR 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

NSCI 800 Neuroscience Current Concepts Units: 3.00
An advanced course that will focus on current research topics in selected areas of Neuroscience. Topics will include research in all fields of specialization within the Neuroscience graduate program (Cellular/Molecular Neuroscience, Systems Neuroscience, Cognitive/Behavioural Neuroscience, Neurological and; Psychiatric Disorders) to introduce students to the breadth of research in Neuroscience. This course is required for all M.Sc. students in the Neuroscience graduate program.Three hour seminar/week: fall. TBA
Offering Faculty: School of Graduate Studies

NSCI 801 Quantitative Neuroscience Units: 3.00
This is a tutorial-based introduction to quantitative methods for neuroscience research. The goal is to provide Matlab/Python-based hands-on skills in signal processing, basic and advanced statistics, data neuroscience (machine learning) and model fitting methods. This includes an introduction to scientific programming as well as causality-supporting methods and open science framework approaches.
Offering Faculty: School of Graduate Studies

NSCI 803 Magnetic Resonance Imaging Units: 3.00
This course is designed for graduate students who want to learn the theory and practice of magnetic resonance imaging (MRI) for anatomical imaging, imaging of dynamic physiological processes, and MRI to detect neuronal function (functional MRI, fMRI). The course will allow the student to gain an understanding of the principles that underlie the applications of MRI and fMRI as a research tool.Three hour lecture/week; fall. P. Stroman
Offering Faculty: School of Graduate Studies

NSCI 813 Advances in Neuropharmacology Units: 3.00
Recent advances in understanding neurotransmission and pharmacology in the central nervous system will be discussed. The current literature describing progress in understanding molecular, cellular and behavioural aspects of brain function, and the impact of drugs and disease, will be examined. Winter; seminars. Given in years ending with an uneven number.
PREREQUISITE: Permission of Graduate Program
EXCLUSION: PHAR-810*, BMED-813*
Offering Faculty: School of Graduate Studies

NSCI 815 Special Directed Topics Units: 3.00
Designed for students with special interests that are not covered by existing courses offered in the Centre for Neuroscience Studies. Normally, this will take the form of a closely supervised reading course in the area of a graduate instructor's expertise, but may also include supervised laboratory work and/or specialized clinical experience. A plan of study must be approved by course coordinator.
Offering Faculty: School of Graduate Studies

NSCI 822 Cell. & Molecular Neuroscience Units: 3.00
An in-depth study of the biophysical properties of neurons and diseases that affect the function of neurons and glia. (same as ANAT 822 and PHGY 822) Topics will include cable properties of dendrites, voltage- and ligand-dependent channels, and molecular mechanisms responsible for neuronal death and regeneration. The course will be based on lectures and student seminars of selected readings. Given concurrently with LISC-422*, with additional assignments for graduate students.One hour lecture/week, 2 hour seminar/week: winter. K. Rose. (Offered in years ending in an even number)
Offering Faculty: School of Graduate Studies

NSCI 825 Medical Neuroscience Units: 6.00
A multidisciplinary graduate level course exposing students to the clinical aspects of neuroscience . Didactic lectures cover detailed organization of the nervous system with clinical implications. Laboratories review basic neuroanatomy and pathology. Clinical demonstrations expose students to several neurological disorders. Lectures, laboratories, and clinical cases.
Offering Faculty: School of Graduate Studies

NSCI 826 Cognitive Neuroscience Units: 3.00
A course for graduate students to explore advanced concepts of cognitive processes in the central nervous system. This is a multi-disciplinary lecture/seminar course with active student participation expected. The course will consist of weekly sessions focusing on specific concepts such as perception, motor processing, reward systems, working memory, executive functions and decision making. Offered jointly with NSCI-426.
PREREQUISITE: Permission of Instructor
EXCLUSION: ANAT-826*, PHGY-826*
Offering Faculty: School of Graduate Studies

NSCI 829 Clinical Neuroscience Units: 3.00
A multi-disciplinary course exploring advanced concepts of clinical neuroscience . Topics can include stroke, traumatic brain and cord injuries, neurodegenerative disorders, epilepsy, schizophrenia, depression, deep brain stimulation, pain and placebo effects, normal and abnormal aging, stem cells. Students will learn to critically evaluate scientific literature and present these concepts to classmates during student-led seminars. Enrolment is limited.
Offering Faculty: School of Graduate Studies

NSCI 830 Biological, Clinical, and Social Aspects of Dementia Units: 3.00
Alzheimer¿s disease and related dementias will have an increasing importance in the field of neuroscience given the aging of the Canadian population. The purpose of this course is to provide an overview of the major topic areas in dementia research and provide a foundation for understanding the complexity of dementia research across disciplines and research methodologies.
Offering Faculty: School of Graduate Studies

NSCI 844 Controversies in Neuroscience Units: 3.00
As insight regarding the human brain expands, so do related issues such as what constitutes personhood, what drives the criminal mind, intelligence-enhancing drugs and end-of-life issues. Lead by experts who deal daily with such concerns, we will focus weekly on a particular topic in neuroscience which impacts on society.
PREREQUISITE: At minimum, an introductory course in the Neurosciences or permission of the Instructor.
Offering Faculty: School of Graduate Studies

NSCI 850 Computational Neuroscience Units: 3.00
This course will provide an overview and hands on experience of the most important computational approaches in Neuroscience. The main topics covered include single cell and neural network modelling, Bayesian approaches, State Space modelling and Optimal Control Theory. More specific modelling approaches will also be discussed as well as some widely used computational data analysis methods.
Offering Faculty: School of Graduate Studies

NSCI 855 Modelling in Neuroscience Units: 3.00
This course is based on the annual Summer School in Computational Sensory-Motor-Neuroscience (CoSMo), which is a 2-week (12 days) intensive course. Through lectures, tutorials and a problem-based project, students will gain advanced knowledge and experience in the application of computational methodologies to modelling in neuroscience.
Offering Faculty: School of Graduate Studies

NSCI 868 Clinical neuroscience methods Units: 1.00
The objective of this course is to familiarize graduate students with the principles and practice of cutting edge technologies used in clinical neuroscience methods involved in biomedical research. (Weight= 1.0 credit unit) EXCLUSION: BMED-868
Offering Faculty: School of Graduate Studies

NSCI 899 Master's Thesis Research Units: 6.00
Offering Faculty: School of Graduate Studies

NSCI 999 Ph.D Thesis Research Units: 6.00
Offering Faculty: School of Graduate Studies

PATH 120 Understanding Human Disease in the 21st Century Units: 3.00
The course provides an introduction to human disease and our understanding of key conditions with major global health and societal impact, including cardiovascular, neurological and infectious diseases and cancer. The basic concepts of disease mechanisms and current management will be explored using specific diseases and clinical example cases. Also offered online.
LEARNING HOURS may vary 120(12L;36G;36O;36P)
Requirements: One-Way Exclusion PATH 310/3.0; CANC 440/3.0
Offering Faculty: Faculty of Health Sciences

PATH 310 Introduction to Pathology and Molecular Medicine Units: 3.00
An introduction to pathology and molecular medicine. The course will be organized around a specific set of diseases, designed to illustrate basic concepts in the molecular biology, biochemistry, and pathology of human disease.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office.
Requirements: Minimum 3rd year (Level 3) standing and one of (BCHM 218/3.0; BCHM 270/3.0).
Course Equivalencies: PATH310, PATH410
Offering Faculty: Faculty of Health Sciences

PATH 381 Clinical Biochemistry Units: 3.00
PATH 381 covers advanced topics of biochemistry and analytical chemistry in relation to the practice of clinical biochemistry in healthcare. Students will critique how laboratory principles, biochemistry, and analytical techniques are applied to practical medical problems in the context of various diseases. Through problem-based learning approaches, students will gain experience in identifying and troubleshooting issues in laboratory testing as well as the integrated role of clinical biochemists within a healthcare team.
Requirements: Minimum 3rd year (Level 3) standing and one of (BCHM 270/3.0 or BCHM 218/3.0), or permission of the instructor.
Offering Faculty: Faculty of Health Sciences

PATH 411 Applied Data Science in Molecular Medicine Units: 3.00
The course introduces data science tools and methods to handle, process and extract knowledge and insights from large molecular medicine datasets. The focus will be on applying statistics, machine learning and related methods for the analysis of various research datasets and digital pathology.
LEARNING HOURS 120(18L12pC;84G;6O;36P)
Requirements: PREREQUISITE BIOL 243/3.0 or ECON 250/3.0 or GLPH 247/3.0 or NURS 323/3.0 or POLS 385/3.0 or PSYC 202/3.0 or SOCY 211/3.0 or STAT 263/3.0 or STAM 200/3.0
Offering Faculty: Faculty of Health Sciences

PATH 420 Research Project Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 425 Current Topics in Human Genetics Units: 3.00
An advanced level course introducing current topics in human genetics. The course will focus on the significance and implications of genetic variation and its role in disease, development and normal human diversity. In particular, the course will explore the future directions and implications of human genetic research in the post genomic era. Participation in seminars and group discussions is required. Enrollment is limited.
RECOMMENDATION BCHM 218/3.0 or MBIO 218/3.0 or permission of the course coordinator.
Requirements: BIOL205
Offering Faculty: Faculty of Health Sciences

PATH 430 The Molecular Basis of Disease Units: 3.00
An in-depth perspective of the pathogenesis of human disease. An integration of the genetic, biochemical, physiologic, anatomic, and general etiologic factors which play a role in the progression of several specific diseases from inception to death or recovery. The course will comprise short introductory presentations by teaching faculty followed by the presentation and discussion of relevant scientific papers by students. Given jointly with PATH 826/3.0.
Requirements: PREREQUISITE PATH 310/3.0 and Level 4 and (registration in a LISC Major or Specialization Plan) and (a GPA of 2.5).
Offering Faculty: Faculty of Health Sciences

PATH 499 Research Project in Pathology Units: 12.00
A research project involving the study of human disease processes. The project will be supervised by a Faculty member in the Department and will provide opportunities for experimental design, data analysis and both written and oral presentation of results. Students must contact a potential faculty supervisor in the Spring preceding registration in fourth year.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in a LISC Specialization Plan and a cumulative GPA of 2.50 or higher.
Exclusion ANAT 499; CANC 499; EPID 499; LISC 499; MICR 455; MICR 499; NSCI 499; PHAR 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

PATH 520 General Pathology Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 521 Special Pathology Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 522 Pathology Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 595 Independent Study Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 799 Introduction To Animal Care Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 822 Exper Cancer Therapeutics Units: 3.00
Intended for students engaged or interested in pre-clinical cancer research. Both medical and basic science trainees are encouraged to take this course. Specific areas to be covered include introduction to new drug development, molecular basis of oncogenic transformation and signalling pathways, challenges with current cancer therapeutics, molecular approaches to profiling human cancers as tools for identifying biochemical and genetic abnormalities and developing criteria for reliable prognostic indicators; strategies for novel target and drug discovery, as well as experimental drug delivery; novel imaging approaches to enhance the sensitivity of preclinical testing and selection of responsive patients; preclinical (in vitro and animal) models for validating experimental targets; clinical drug development and testing of novel anti-cancer drugs; and the molecular basis for variability in tumour responses. Half course, lectures and seminars; fall term. C. Nicol
Offering Faculty: Faculty of Health Sciences

PATH 823 Cancer Biology Units: 3.00
The aim of this course is to introduce and discuss essential questions in the basic science of oncology. Trainees with an interest in cancer research are encouraged to take this course. Topics include pathology of cancer, cancer genetics, growth factors, signal transduction, oncogenes, suppressor genes, early stage tumorigenesis, tumor immunology and metastasis. A general theme for the course will be mechanisms regulating neoplastic transformation and tumor progression. In order to provide a balance and high profile in all areas, various staff members in the Cancer Research Institute and associated departments have been selected as session leaders in this course. Half course, lectures and seminars; fall term. B. Elliott.
Requirements: ANAT311 OR BCHM411 OR MICR360
Offering Faculty: Faculty of Health Sciences

PATH 826 The Molecular Basis Of Disease Units: 3.00
This course covers several diseases that highlight the genetic, biochemical, physiologic, anatomic, and general etiologic factors that play a role in the progression of each disease from its inception to death or recovery. Some of the topics will be drawn from the ongoing research within the Department of Pathology and Molecular Medicine. The perspective will demonstrate that each disease is the result of an evolving interplay of genetic and environmental factors. (Jointly with PATH-430*. Additional work prescribed for graduate students.) Half-course, lectures and seminars; Winter term. D. Lillicrap.
Requirements: PATH410 OR ANAT311 OR BCHM310 OR PHGY312
Offering Faculty: Faculty of Health Sciences

PATH 827 Research Project In Patholgy Units: 3.00
Research projects in the physiological, biological, genetic and molecular basis of disease. Students will review the literature related to their proposed graduate research thesis project and write a series of essays on topics selected in consultation with a supervisory committee consisting of their supervisor and two other faculty. They will also develop a written draft research proposal that will be presented to their supervisory committee and defended in a final oral examination. To be taken by all students in the first full term of the graduate program. P.Greer (course coordinator).
Offering Faculty: Faculty of Health Sciences

PATH 828 Bioinformatics for Cancer Research Units: 3.00
Bioinformatics is an essential component of biological and health science research given the ongoing developments in generating large amounts of data in short periods of time. This course introduces tools and methods to manage and analyze the results obtained in cancer research. Topics include study design, basic statistics for clinical and genetic research, data-mining approaches and alternative methods to statistics for data analysis, and signaling pathways analysis. The course will cover the appropriate pre-processing and data analysis techniques for various genetic data types such as microarray, tissue microarrays, methylation, NanoString, RNAseq, miRNAseq, proteomics and qRT-PCR. Students with little computing background, but who are interested in pursuing or collaborating with bioinformatic research, are encouraged to enroll.
Offering Faculty: School of Graduate Studies

PATH 830 Pathology and Molecular Medicine Research Seminar Series Units: 3.00
This seminar series consists of weekly presentations by visiting external speakers, Queen's faculty, and Departmental MSc and PhD students. MSc students will give 1/2 hour seminars in their first year, and one hour seminars in their second year; PhD students will give 1 hour seminars in their first and third years, and an exit seminar in their final year. Attendance by all Departmental graduate students is compulsory and will be monitored by the Graduate Program Coordinator. Departmental faculty will provide evaluations of student presentations. Only one mark will be assigned, based on the average of the student's first two seminars. If a grade is submitted for Path 830, a second rading for Path 930 is unnecessary.
Offering Faculty: Faculty of Health Sciences

PATH 899 Master's Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

PATH 930 Pathology and Molecular Medicine Research Seminar Series Units: 3.00
Pathology and Molecular Medicine Research Seminar Series This seminar series consists of weekly presentations by visiting external speakers, Queen's faculty, and Departmental MSc and PhD students. MSc students will give 1/2 hour seminars in their first year, and one hour seminars in their second year; PhD students will give 1 hour seminars in their first and third years, and an exit seminar in their final year. Attendance by all Departmental graduate students is compulsory and will be monitored by the Graduate Program Coordinator. Departmental faculty will provide evaluations of student resentations. Only one mark will be assigned, based on the average of the student's first two seminars. If a grade is submitted for Path 830, a second grading for Path 930 is unnecessary.
Offering Faculty: Faculty of Health Sciences

PATH 999 Ph.D. Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

PHAR P10 Drugs & Their Actions Units: 3.00
Offering Faculty: Faculty of Health Sciences

PHAR 100 Introductory Pharmacology Units: 3.00
Topics covered include central nervous system stimulants and depressants, narcotics, alcohol, cardiovascular agents, contraceptives, environmental toxicants, mechanism of drug action and disposition, antibiotics, drugs used in sports, over-the-counter drugs, food additives, and vitamins.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office. Learning Hours may vary.
Requirements: One-Way Exclusion PHAR 230/3.0; PHAR 270/3.0; PHAR 340/3.0; PHAR 370/3.0; PHAR 450/3.0
Offering Faculty: Faculty of Health Sciences

PHAR 230 Pharmacology for the Health Sciences Units: 3.00
Lecture series on the following topics: principles of drug action, autonomic pharmacology, cardiovascular-renal pharmacology, neuropsychopharmacology, chemotherapy, drugs acting on the endocrine system, over-the-counter drugs, and therapeutic applications.
LEARNING HOURS 122 (36L;8G;78P)
Requirements: Co PHGY21# Exclusion
Offering Faculty: Faculty of Health Sciences

PHAR 340 Principles of General Pharmacology I Units: 3.00
Topics include: fundamental principles of drug action, autonomic nervous system pharmacology, and toxicology.
LEARNING HOURS 120 (27L;24T;69P)
Requirements: PREREQUISITE (PHGY 215 and PHGY 216) or BIOL 339 or PHGY 210 or PHGY 214 EXCLUSION No more than 3.0 units from PHAR 230; PHAR 270; PHAR 340; PHAR 370.
Offering Faculty: Faculty of Health Sciences

PHAR 341 General Pharmacology Units: 3.00
Requirements: BCHM315 OR BCHM310
Offering Faculty: Faculty of Arts and Science

PHAR 370 Fundamentals of Pharmacology and Therapeutics Units: 3.00
An interdisciplinary course that introduces the basic principles and clinical applications of pharmacology. This 12-week course covers six topics. Students will work through the topics online, using a combination of online modules, readings, and short video clips. Students will participate in a variety of assessments throughout the course.
LEARNING HOURS may vary: 120(48O;72P)
Also offered online.
Requirements: Corequisite One of (PHGY 215/3.0 and PHGY 216/3.0) or KNPE 225/3.0. Exclusion PHAR 230/3.0; PHAR 270/3.0; PHAR 340/3.0 One-Way Exclusion PHAR 450/3.0
Offering Faculty: Faculty of Health Sciences

PHAR 380 Drug and Environmental Toxicology Units: 3.00
This course will explore the human toxicology associated with both pharmaceutical and environmental exposures. Topics include metabolism and mechanisms of toxicity of various pharmaceuticals and environmental pollutants. Toxicological effects of specific classes of environmental toxicants and different groups of pharmaceuticals are also discussed.
NOTE Also offered online. Consult Bachelor of Health Sciences program office.
LEARNING HOURS may vary 120 (60O;60P)
Requirements: Minimum 3rd year (Level 3) standing and one of (BCHM 270/3.0; BCHM 316/3.0; BCHM 218/3.0; BIOL 334/3.0).
Offering Faculty: Faculty of Health Sciences

PHAR 416 Xenobiotic Disposition and Toxicity Units: 3.00
An advanced study of chemical disposition and toxicity. Topics include toxicokinetics, biotransformation, metabolite-mediated toxicity, free radicals, the mechanism of action of toxicants, effects of toxicants on organ systems and a detailed examination of selected toxic agents.
NOTE BCHM, BIOL, BMCO ELSC and ETOX students should contact the department for permission to enrol in this course.
LEARNING HOURS 120 (36L;84P)
Requirements: PREREQUISITES (PHAR 340 or BCHM 310 or BCHM 316 or BIOL334) and Level 4 and a GPA of 2.5.
Offering Faculty: Faculty of Health Sciences

PHAR 450 Principles of General Pharmacology II Units: 3.00
Topics include: neuropsychopharmacology, cardiovascular pharmacology, agents acting on the endocrine system, and chemotherapy.
NOTE This course involves team based learning sessions and a drug literature evaluation assignment.
Requirements: Prerequisite (PHAR 230 or PHAR 270 or PHAR 370 with a min grade of B) or PHAR 340.
Offering Faculty: Faculty of Health Sciences

PHAR 480 Drug Discovery and Development Units: 3.00
This survey course covers the life-cycle of pharmaceutical products including discovery, development, and the transition to a generic or over-the-counter medication. Specific themes include target identification, design and synthesis, efficacy determination, optimization, preclinical safety assessment, clinical trials, and the differences between biologics and small chemical entities. Social and economic pressures exerted upon the pharmaceutical industry are also explored.
Requirements: Minimum 4th year (Level 4) standing and one of (PHAR 230/3.0; PHAR 370/3.0; PHAR 340/3.0). LISC MAJ SSP students require a GPA of 2.5. Note this course cannot be used as credit towards the LISC DDHT SSP Plan Exclusion DDHT 459/3.0; DDHT 460/3.0
Offering Faculty: Faculty of Health Sciences

PHAR 499 Research Project in Pharmacology and Toxicology Units: 12.00
An examination of the development and present state of knowledge in selected research areas of pharmacology and toxicology. Research project involves experimental design, data collection and analysis, written report and oral presentation. Students will be required to attend seminars and tutorials on topics related to research.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in a LISC or ELSC Specialization Plan and a cumulative GPA of 2.50 or higher. Exclusion ANAT 499; CANC 499; EPID 499; LISC 499; MICR 455; MICR 499; NSCI 499; PATH 499; PHGY 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

PHAR 799 Introduction To Animal Care Units: 6.00
Offering Faculty: Faculty of Health Sciences

PHAR 810 Advances In Neuropharmacology Units: 3.00
Recent advances in understanding neurotransmission and pharmacology in the central nervous system will be discussed. The current literature describing progress in understanding molecular, cellular and behavioural aspects of brain function, and the impact of drugs and disease, will be examined. Winter; seminars and tutorials. Given in years ending with an uneven number. J.N. Reynolds
Requirements: PHAR450 OR LISC322
Offering Faculty: Faculty of Health Sciences

PHAR 811 Drug Discovery & Development Units: 3.00
An advanced course in which various aspects of the drug discovery and development process, from molecules to community, will be studied. The course comprises lectures, discussion and student seminars, based on recent literature. Topics encompass medicinal chemistry approaches to drug discovery, receptor theory, mechanisms of drug action, drug metabolism, pharmacokinetics, pharmacogenetics, drug resistance, clinical trials, and regulatory affairs. Fall, 3 hour seminar. Given in years ending with an even number. T.E. Massey
Requirements: BCHM310
Offering Faculty: Faculty of Health Sciences

PHAR 814 Princ Of Analyt. Toxicology I Units: 3.00
Offering Faculty: Faculty of Health Sciences

PHAR 815 Mechanistic Toxicology Units: 3.00
An advanced, problem-based course focusing on current approaches to the study of mechanisms of chemical toxicity. Winter; 3 hour seminars and tutorials. Given in years ending with an even number. T.E. Massey
Requirements: BCHM310
Offering Faculty: Faculty of Health Sciences

PHAR 821 Pharmacology Seminar Units: 3.00
Topics covered: selected topics in pharmacology and toxicology will be presented and discussed by staff, students, and visiting lecturers. Fall and winter; one hour per week. J.F. Brien
Offering Faculty: Faculty of Health Sciences

PHAR 999 Ph.D. Thesis Research Units: 6.00
Offering Faculty: Faculty of Health Sciences

PHGY 170 Human Cell Physiology Units: 3.00
This is an introductory level course on the structure and function of human cells for students interested in pursuing human health-related disciplines. Students will also learn the principles of energy metabolism, cell growth and proliferation, and how cells interact with their environment. There is also an overall focus to relate cellular processes to human function and disease, culminating in a group presentation focused on one specific cell process and how it affects health. Students taking this course will be well-prepared for upper year molecular biology courses.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office. Learning Hours may vary.
LEARNING HOURS may vary 114 (36O;78P)
Requirements: One-Way Exclusion KNPE 225/3.0
Offering Faculty: Faculty of Health Sciences

PHGY 215 Principles of Mammalian Physiology l Units: 3.00
The focus of this course is on the central and peripheral nervous systems, muscle physiology, the heart, and the vascular system.
NOTE This course may be paired with PHGY 216/3.0 to achieve an introductory physiology full course (6.0 units).
NOTE Although it is recommended to take PHGY 215/3.0 first, this course can be taken before, after, or concurrently with PHGY 216/3.0.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office. Learning Hours may vary.
Requirements: Minimum 2nd year (Level 2) standing. Exclusion (KNPE 125/3.0; KNPE 225/3.0); [PHGY 210/6.0; PHGY 214/6.0; (PHGY 215/3.0 and PHGY 216/3.0)].
Offering Faculty: Faculty of Health Sciences

PHGY 216 Principles of Mammalian Physiology ll Units: 3.00
The focus of this course is the physiology of the respiratory, renal, gastrointestinal, endocrine, and reproductive system.
NOTE This course may be paired with PHGY 215/3.0 to achieve an introductory physiology full course (6.0 units).
NOTE Although it is recommended to take PHGY 215/3.0 first, PHGY 216/3.0 can also be taken before or concurrently with PHGY 215/3.0.
NOTE Also offered online. Consult the Bachelor of Health Sciences program office.
Learning hour may vary.
Requirements: Minimum 2nd year (Level 2) standing. Exclusion (KNPE 125/3.0;KNPE 225/3.0); [PHGY 210/6.0;PHGY 214/6.0;(PHGY 215/3.0 PHGY 216/3.0)]. Note it is recommended to take PHGY 215/3.0 first, PHGY 216/3.0 can be taken before or concurrently with PHGY 215/3.0.
Offering Faculty: Faculty of Health Sciences

PHGY 290 Investigation of Human Physiological Responses Units: 3.00
This course is designed to advance critical thinking and practical lab skills through collaborative experimentation on human physiological responses to various stimuli. Upon completion, students should be able to (i) plan and perform experimental protocols, (ii) collect, analyze and interpret data and (iii) produce quality presentations of findings.
LEARNING HOURS 120(36Lb;48O;36P)
Requirements: Corequisite Minimum 2nd year (Level 2) standing, registration in a BHSc, LISC, or BCHM program, and (PHGY 215/3.0 and PHGY 216/3.0. Note: We recommend that students should have already completed a statistics course (e.g. HSCI 190/3.0 or equivalent)
Offering Faculty: Faculty of Health Sciences

PHGY 350 Pathophysiology Units: 3.00
An introductory course in Pathophysiology in which the underlying functional changes of cell and cell systems will be discussed in association with a variety of disease processes.
LEARNING HOURS 114 (36L;6O;72P)
Requirements: Prerequisite (PHGY 215 and PHGY 216) or (KNPE 125 and KNPE 225) or PHGY 210 or PHGY 212 or PHGY 214
Offering Faculty: Faculty of Health Sciences

PHGY 355 Biomedical Respiratory Physiology Units: 3.00
An intermediate course focusing on biomedical applications of lung biology. Topics include lung mechanics, gas exchange, acid-base balance and control of breathing.
Requirements: PREREQUISITE (PHGY 215/3.0 and PHGY 216/3.0) or PHGY 210/6.0 or PHGY 212/6.0 or PHGY 214/6.0.
Offering Faculty: Faculty of Health Sciences

PHGY 370 Pathophysiology Units: 3.00
PHGY 370, Pathophysiology is an introductory course in which the underlying functional changes of cells and physiological systems will be discussed in association with a variety of disease processes. This course builds on the knowledge and concepts learned in prerequisite physiology courses and uses that foundation to understand how human disease disrupts the function of the major systems of the body, and to a lesser degree, how it is diagnosed and treated.
Requirements: Minimum 3rd year (Level 3) standing and ANAT100 and one of PHGY 170; IDIS 150; PHGY 210; PHGY 214 or permission of the instructor.
Offering Faculty: Faculty of Health Sciences

PHGY 424 Ion Channels of Excitable Cells Units: 3.00
The electrophysiology and biophysics of neuronal and cardiac membranes; molecular biology, structure, and function of ion channels. Students will learn to critically evaluate scientific literature. Instructional format is primarily student-led seminars.
Requirements: PREREQUISITE Level 4 and registration in a LISC Major or Specialization Plan and a GPA of 2.5 and [a minimum grade of C in (PHGY 215/3.0 and PHGY 216/3.0) or PHGY 210/6.0 or PHGY 212/6.0 or PHGY 214/6.0].
Offering Faculty: Faculty of Health Sciences

PHGY 444 Gastrointestinal Physiology Units: 3.00
Cellular and molecular approaches to human intestinal function are described and synthesized into an understanding of intestinal physiology at the organ level. Taught by GI researchers and clinician-scientists; students prepare and present critical appraisals of current primary research papers.
Requirements: PREREQUISITE Level 4 and registration in a LISC Major or Specialization Plan and a GPA of 2.5 and [a minimum grade of C in (PHGY 215/3.0 and PHGY 216/3.0) or PHGY 210/6.0 or PHGY 212/6.0 or PHGY 214/6.0].
Offering Faculty: Faculty of Health Sciences

PHGY 494 Neuroendocrinology Units: 3.00
Students are exposed to an in depth study of selected topics in neuroendocrinology and neuroendocrine techniques. Neuroendocrinology refers to the neural control of endocrine and autonomic function. Areas of focus will include central nervous system control of cardiovascular function, reproduction, and appetite. In addition, students will learn to critically evaluate scientific literature. Instructional format is primarily student led seminars.
LEARNING HOURS 114 (36S;12O;96P)
Requirements: PREREQUISITE A minimum grade of B in: PHGY 210 or PHGY 212 or PHGY 214 or (PHGY 215 and PHGY 216) and Level 4 in a LISC Major or Specialization Plan and (a GPA of 2.5).
Offering Faculty: Faculty of Health Sciences

PHGY 499 Research Project in Physiology Units: 12.00
An investigation in a selected area of physiology. The project involves experimental design, data collection and analysis, submission of written reports, and oral presentations. Students attend seminars/tutorials on related topics.
NOTE Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (288Lb;24G;24I;144P).
Requirements: Prerequisite Level 4 and registration in a LISC Specialization Plan and a cumulative GPA of 2.50 or higher. Exclusion ANAT 499; CANC 499; EPID 499; LISC 499; MICR 455; MICR 499; NSCI 499; PATH 499; PHAR 499; REPD 499.
Offering Faculty: Faculty of Health Sciences

PHGY 810 Current Concepts In Physiology Units: 3.00
An advanced course on current research of selected areas of physiology. This course is comprised of critical lectures and discussion based on recent literature. Compulsory for all new graduate students in Physiology. Winter term; 3 hour seminar.
Offering Faculty: Faculty of Arts and Science

PHGY 823 General & Cellular Physiology Units: 6.00
Offering Faculty: Faculty of Arts and Science

PHGY 824 Ion Channel Of Excitable Cells Units: 3.00
The electrophysiology and biophysics of neuronal and cardiac membranes; molecular biology, structure, and function of ion channels. Students will learn to critically evaluate scientific literature. Instructional format is primarily student-led seminars. N. Magoski. Enrolment is limited. (Offered even years only jointly with PHGY 424).
Offering Faculty: Faculty of Arts and Science

PHGY 826 Sensorimotor Integration Units: 3.00
A course for graduate students to explore more advanced concepts of sensorimotor integration in the nervous system. This is a multi-disciplinary lecture/seminar course with active student participation expected. The course will consist of weekly sessions focusing on specific concepts such as feature detection, population coding, sensorimotor transformations, reflexes versus voluntary control, central pattern generators. Normally offered concurrently with PSYC-924*. Winter term; 1 hour lecture; 2 hour seminar/discussion. M. Dorris. Not offered 2010-2011.
Offering Faculty: Faculty of Arts and Science

PHGY 836 Advanced Physiology Units: 3.00
An advanced course for honours and graduate students in which selected areas of physiology are studied in depth. Two hours seminar. S. Iscoe.
Offering Faculty: Faculty of Arts and Science

PHGY 840 Digestive Sciences I Units: 3.00
A laboratory-based course providing an advanced survey of state-of-the-art methodologies. This course is designed to give the student experience in cellular, molecular and whole tissue techniques with applications to digestive and related sciences. Fall term; 2 hours seminar / 4 hours laboratory on alternate weeks. R.J. MacLeod. Not offered 2010-2011.
Offering Faculty: Faculty of Arts and Science

PHGY 841 Digestive Sciences II Units: 3.00
A laboratory-based course designed to explore in greater depth a sub-group of the techniques studied in PHGY-840* and involving at least two full weeks of intensive laboratory work. The techniques will be chosen to complement the student's graduate research. Winter or Spring/summer term. R.J. MacLeod. Not offered 2010-2011.
Offering Faculty: Faculty of Arts and Science

PHGY 844 Gastrointestinal Physiology Units: 3.00
The mechanisms and regulation of motor, secretory, digestive and absorptive functions of the gastrointestinal tract are considered. Students will be required to prepare and present reviews of original literature. Fall/winter terms. (Enrolment in both terms is required to achieve credit.) One hour lecture/ week; 1 hour seminar alt. wks. M. Blennerhassett. Offered jointly with PHGY-444.
Offering Faculty: Faculty of Health Sciences

PHGY 856 Cardiorespiratory Physiology Units: 6.00
Offering Faculty: Faculty of Arts and Science

PHGY 857 Cardiovascular Physiology Units: 3.00
Offering Faculty: Faculty of Arts and Science

PHGY 864 Respiratory Physiology Units: 6.00
Offering Faculty: Faculty of Arts and Science

PHGY 875 Neurophysiology Units: 6.00
Offering Faculty: Faculty of Arts and Science

PHGY 876 Neurophysiology Units: 3.00
Offering Faculty: Faculty of Arts and Science

PHGY 877 Special Topics:Neurophysiology Units: 3.00
Offering Faculty: Faculty of Arts and Science

PHGY 894 Neuroendocrinology Units: 3.00
Students are exposed to an in depth study of selected topics in neuroendocrinology and neuroendocrine techniques. Neuroendocrinology refers to the neural control of endocrine and autonomic function. Areas of focus will include CNS control of cardiovascular function, reproduction, and appetite. In addition, students will learn to critically evaluate scientific literature. Instructional format is primarily student-led seminars. (Offered jointly with PHGY-494). Winter term. D. Van Vugt.
Offering Faculty: Faculty of Health Sciences

PHGY 897 Physiology Seminar Program Units: 3.00
Students will be required to attend the Departmental seminar program and present a seminar based upon their graduate thesis research. Students will also provide a proposal for their thesis research which includes a review of the related literature. Departmental faculty will evaluate both the seminar and the proposal/review. Enrolment extending over 6 terms (2 years; required for new Master¿s level Physiology graduate students. 1 hour seminar/week; Fall, Winter and Spring/Summer. N. Magoski.
Offering Faculty: Faculty of Arts and Science

PHGY 999 Ph. D. Thesis Research Units: 6.00
Offering Faculty: Faculty of Arts and Science

REPD 372 Reproduction and Development Units: 3.00
Students will obtain a general background on various aspects of human reproduction, ranging from male and female gamete development to pregnancy and birth. The course will serve as a gateway to more advanced courses in human reproduction and development.
NOTE Also offered online. Consult the Bachelor of Health Sciences program.
LEARNING HOURS may vary 120 (60O;60P)
Requirements: Minimum 3rd year (Level 3) standing, one of (ANAT 100/3.0; ANAT 101/3.0; [ANAT 215/3.0 and ANAT 216/3.0]; [ANAT 315/3.0 and ANAT 316/3.0]) and one of (PHGY 210/6.0; PHGY 214/6.0; [KNPE 125/2.0 and KNPE 225/3.0]; [PHGY 215/3.0 and PHGY 216/3.0]).
Offering Faculty: Faculty of Health Sciences

REPD 387 Sexual Dimorphism in Reproductive Pathologies Units: 3.00
This course will be focus on, 1. Common and rare reproductive pathologies with sex and gender associated susceptibilities and disease outcomes. 2. Role of sexual dimorphism in etiology, pathogenesis and immune responses of reproductive diseases. 3. Conventional and advanced tools in diagnosis and treatment of reproductive diseases.
LEARNING HOURS 120 (24L;12S;36G;48P)
Requirements: Prerequisite Level 3 and (registration in a LISC/BCHM Major or Specialization Plan or BHSC program) and (a GPA of 2.5) and one of (MICR 270, MICR 360, BMED 386) and BCHM 218
Offering Faculty: Faculty of Arts and Science

REPD 416 Biology of Reproduction Units: 3.00
Comprehensive overview of cellular and molecular biology of mammalian
reproduction including gametogenesis, fertilization, early embryo development and placentation; selected topics of clinical aspects of reproduction. Participation in seminars and group discussion is required.
LEARNING HOURS 120 (36L;36S;48P)
Requirements: PREREQUISITE Level 4 and (registration in a LISC Major or Specialization plan) and (a GPA of 2.7) and either [(ANAT 215 and ANAT 216) or ANAT 309].
Offering Faculty: Faculty of Health Sciences

REPD 473 Developmental Origins of Health And Disease Units: 3.00
REPD 473, Development Origins of Health and Disease, will cover how the early-life environment contributes to later-life health. Four major topics will be covered: maternal exposures, maternal nutrition, infection, and pregnancy complications. Students will learn about how alterations in the embryonic and fetal environment due to these four parameters can and do contribute to the development of non-communicable diseases that persist throughout life. Students will have the opportunity to explore and consolidate the academic literature pertaining to DOHaD, as well as investigating the resources available to these populations of patients.
Requirements: Minimum 4th year (Level 4) standing and one of (PHAR 230/3.0; PHAR 370/3.0; PHAR 340/3.0; PHAR 380/3.0) and REPD 372/3.0.
Offering Faculty: Faculty of Health Sciences

REPD 499 Research Project in Reproduction and Development Units: 12.00
An examination of the development and present state of knowledge in selected research areas of Reproduction and Development. Research project involves experimental design, data collection and analysis, written report, poster presentation and oral presentation. Students will be required to attend seminars and tutorials on topics related to research.
NOTE Limited enrolment; restricted to 4th year honours; permission of the Department required. Acceptance by a supervisor required prior to registration.
NOTE Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.
LEARNING HOURS 480 (24L;48S;192Lb;168P)
Requirements: Prerequisite Level 4 and registration in a LISC Specialization Plan and a cumulative GPA of 2.50 or higher. Exclusion ANAT 499; CANC 499; EPID 499; MICR 499; NSCI 499; PATH 499; PHAR 499; PHGY 499.
Offering Faculty: Faculty of Arts and Science