

COURSES OF INSTRUCTION

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 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 (36 Lecture, 24 Laboratory, 60 Private Study)

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: Prerequisite (ANAT 215 and ANAT 216) or (ANAT 315 and ANAT 316) or (PHGY 215 and PHGY 216).

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: 120 (48 Online Activity, 72 Private Study)

Requirements: Minimum 3rd year standing one of: ANAT 100 OR ANAT 101 OR ANAT 215/216 OR ANAT 315/316 AND one of: PHGY 215/216 OR KNPE 125/225

Offering Faculty: Faculty of Health Sciences

ANAT 391 Introduction to Cadaveric Dissection Units: 3.00

Students work individually and collaboratively to develop macro and microdissection skills using human cadaveric specimens. Students learn how cadaveric dissection for teaching purposes (prosection) influences communication and teaching of anatomy.

Learning Hours: 120 (36 Laboratory, 48 Online Activity, 36 Private Study)

Requirements: Prerequisite Minimum 3rd year (level 3) standing, registration in a LISC/BCHM/BHSc Major or Specialization Plan, and a minimum standing of B+ in one of ([ANAT 100/3.0 or ANAT 101/3.0; and ANAT 380/3.0]; [ANAT 215/3.0 and ANAT 216/3.0]; [ANAT 315/3.0 and ANAT 316/3.0]).

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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of ([ANAT 215/3.0 and ANAT 216/3.0]; (ANAT 315/3.0 and ANAT 316/3.0); ANAT 309/3.0).

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 (48 Online Activity, 72 Private Study)

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]).

Course Equivalencies: ANAT 417, ANAT 471

Offering Faculty: Faculty of Health Sciences

**ANAT 599 Research Inquiry in Anatomy Units: 6.00**

ANAT 599 is a course on collaborative research in the Anatomical Sciences. Students will use a team-based approach to devise a research question that addresses a gap in knowledge in the Anatomical Sciences. Research questions may include basic science queries based in human anatomy, and questions related to teaching and learning in the Anatomical Sciences. In small groups, students will develop and carry out comprehensive research objectives, and draft a complete manuscript of the summative work intended for publication in a peer-reviewed academic journal. Using the skills previously gained in ANAT 391, students will also produce a high-quality prosected human anatomical specimen. The goal of prosection is to dissect a specimen in a stepwise manner aimed at teaching the dissected structures. To develop proficiencies in online anatomical education and communicating complex anatomical concepts, students will be expected to use audio and visual elements to create a presentation highlighting the key features of their respective specimens. Students will participate in self-reflection and peer feedback to think critically about their skills in anatomical research and pedagogy. The advancement of the relevant competences will facilitate professional development. The course has various types of assessments including a practical dissected specimen and accompanying presentation video, thoughtful reflection and peer feedback, and a summative research manuscript. Students will have the opportunity to develop a research question with their teams and complete research objectives in a comprehensive and thoughtful manner, mentored by the course instructors.

Requirements: Prerequisite Minimum 4th year (level 4) standing, registration in the BHSc program, and a minimum grade of A- in ANAT391. No more than 12.0 units from ANAT599/6.0; HSCI591/3.0; HSCI592/3.0; HSCI593/3.0; HSCI594/3.0; HSCI595/3.0; HSCI598/6.0; HSCI599/6.0.

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: 126 (66 Online Activity, 60 Private Study)

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. 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 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; BIOL 205/3.0) or permission of the instructor. . Exclusion BIOL 331/3.0.

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: 114 (36 Online Activity, 78 Private Study)

Requirements: Prerequisite Level 4 or above and registration in a BCHM/LISC Major or Specialization, or BHSc program and a cumulative GPA of 2.5 or higher and ([BCHM 218/3.0 and BCHM 270/3.0 and BCHM 370/3.0] or BCHM 310/9.0 or [BCHM 315/3.0 and BCHM 316/3.0]).

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: 120 (72 Online Activity, 48 Private Study)

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 or above and registration in a BCHM/LISC Major or Specialization, or BHSc program and a minimum GPA of 3.0 in [BCHM 218/3.0 or BCHM 370/3.0]).

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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of [(PHGY 215 and PHGY 216); PHGY 214/6.0; PHGY 212/6.0].

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: 138 (18 Lecture, 10 Seminar, 10 Group Learning, 100 Private Study)

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 tools 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 registration in a LISC Specialization or Major, or BHSc program and a minimum GPA of 2.5 and [PHGY 215/3.0 and PHGY 216/3.0]).

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 (12 Lecture, 24 Group Learning, 84 Private Study)

Requirements: Prerequisite PHAR 270/3.0 or PHAR 340 or PHAR 370. Recommended PHAR 416. Exclusion PHAR 480.

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 (36 Lecture, 84 Private Study)

Requirements: Prerequisite PHAR 270/3.0 or PHAR 340 or PHAR 370. Recommended DDHT 459 and PHAR 416. Exclusion PHAR 480.

Offering Faculty: Faculty of Health Sciences

GLPH 171 Social and Physical Determinants of Health and Disease Units: 3.00

Social and Physical Determinants of Health and Disease will use evidence-based practices to address the impact of social and environmental sources on health at both an individual and population level. Students will focus how the contexts of peoples' lives affect their health, methods for measuring contextual effects, and the role of medical systems in creating health. Students will gain skills to understand and evaluate scientific literature and become community advocates for health by researching and preparing a PSA as a cumulative assessment.

NOTE: Also offered online. Consult the Bachelor of Health Sciences program office.

Note:

Learning Hours: 120 (48 Online Activity, 72 Private Study)

Requirements: Exclusion HLTH 101/3.0; GPHY 339/3.0

Offering Faculty: Faculty of Health Sciences

GLPH 271 Global and Population Health Units: 3.00

In this course, the learning emphasis will be on global and population health, instead of the health of individuals. As a discipline, global and population health prioritizes partnerships and resource sharing, instead of unilateral relationships, as well as having an important focus on advocacy.

NOTE Also offered online.

Learning Hours: 114 (36 Online Activity, 78 Private Study)

Requirements: Minimum 2nd year (Level 2) standing or permission of the instructor.

Offering Faculty: Faculty of Health Sciences

GLPH 281 Racism and Health in Canada Units: 3.00

Students explore the impact of racism on the health of individuals and equity-deserving communities in Canada. A framework conceptualizing the social determinants of Indigenous Peoples' health, progressing from historical data to now are used. Reflection on biases, positionality, and skill development to support positive change are key components.

Learning Hours: 120 (36 Online Activity, 84 Private Study)

Requirements: Minimum 2nd year (Level 2) standing or permission of the instructor.

Offering Faculty: Faculty of Health Sciences

GLPH 385 Biohacking & Gerontechnology Units: 3.00

This course introduces and encourages the use of a global perspective to critically analyze technology developed to support/biohack human aging ranging from basic gerontechnologies that are currently in use to support older adults aging in place to cutting edge anti-aging technology.

NOTE: Also offered online

Learning Hours: 120 (72 Online Activity, 48 Private Study)

Requirements: Minimum 3rd year (Level 3) standing, or permission from the instructor.

Offering Faculty: Faculty of Health Sciences

GLPH 471 Advanced Global and Population Health Units: 3.00

Students will take knowledge gained from GLPH 271, and apply it in this course, which will focus on more advanced topics of population and global health, as well as provide experiential learning.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Requirements: Prerequisite Level 3 or above and (GLPH 271/3.0 or LISC 271/3.0).

Offering Faculty: Faculty of Health Sciences

GLPH 472 Special Populations: Neonatal to End-of-Life-Care Units: 3.00

In this online course, students will examine how variations in determinants of health can affect delivery of health care to special populations and shape health policy. Specific populations covered will include neonates, marginalized populations, those in intensive and end-of-life palliative care.

Requirements: Minimum 4th year (Level 4) standing and IDIS 373/3.0, or permission of instructor.

Offering Faculty: Faculty of Health Sciences

GLPH 482 Foundations of Humanitarian Health Emergencies Units: 3.00

This course will develop skills and advance the application of knowledge to support those affected by humanitarian health emergencies, including natural and man-made disasters. For example, students will assess the critical role of multi-disciplinary collaboration, charitable donations, and volunteer activities within the humanitarian sphere.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (36 Group Learning, 36 Online Activity, 48 Private Study)

Requirements: Prerequisite Level 4 or above. Exclusion HLTH 351/3.0; HLTH 397/3.0 (Topic Title: Health in Humanitarian Crises).

Offering Faculty: Faculty of Health Sciences

GLPH 485 Global Application of Health Informatics Units: 3.00

This fourth-year course will focus on the use of real electronic healthcare data. Students will learn about the history of data processing, the laws and regulations governing the use of healthcare data nationally and internationally, analysis techniques, and how health informatics systems can be used to drive and support health interventions.

Learning Hours: 120 (60 Online Activity, 60 Private Study)

Requirements: Min 4th Year Standing and one of (HSCI 190/3.0; STAM 200/3.0; BIOL 243/3.0; GPHY 247/3.0; KNPE 251/3.0; NURS 323/3.0; POLS 385/3.0; PSYC 202/3.0; STAT 263/3.0). Note: priority will be given to students registered in the Bachelor of Health Sciences pgm

Offering Faculty: Faculty of Health Sciences

GLPH 487 One World, One Health: The Global Link Between Human, Animal, and Environmental Health Units: 3.00

This course uses a socio-cultural lens to examine this multi-disciplinary field focusing on the intersection of human, animal and environmental health - locally and globally. Assessments involve the analysis of history, health policy and research frameworks, incorporating risk factors and diseases. NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (36 Group Learning, 36 Online Activity, 48 Private Study)

Requirements: Prerequisite Level 4 or above.

Offering Faculty: Faculty of Health Sciences

GLPH 488 Global Oncology: Cancer Care, Policy, Research, and Education Units: 3.00

GLPH 488 will focus on the challenges and opportunities of cancer care, education, research, and policy, especially in resource-limited settings. Students will integrate their learning in a research paper based on how cancer policy is at the intersection of all facets of cancer care, ultimately making a difference in outcomes of patients with cancer.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (24 Lecture, 36 Group Learning, 60 Private Study)

Requirements: Prerequisite Level 4 or above.

Offering Faculty: Faculty of Health Sciences

GLPH 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. Students will apply a reflective approach to community engagement in global health and consider the relationship between global health practice.

NOTE Registration must occur by permission through the Bachelor of Health Sciences Office.

132(60Pc;36O;36P)

Requirements: Minimum 4th year (Level 4) standing and GLPH 271/3.0.

Offering Faculty: Faculty of Health Sciences



HSCI 190 Introduction to Statistics for the Health Sciences Units: 3.00

This course is designed to introduce students to basic statistical concepts and techniques and provide them with practical skills for applying statistics to health sciences research. This includes data visualization, probability distributions, descriptive statistics, hypothesis testing, and parameter estimation. Specific techniques such as t-tests, correlations, analysis of variance, and regression analyses will also be covered. Throughout the course, real data will be used to guide learning. Students will also discuss and practice how to effectively interpret and report statistical findings within the health sciences. To be successful in the course assessments, students will need to progressively build their skills and apply the course knowledge to 1) select appropriate statistical tests based on the research question and data, 2) interpret findings from descriptive and statistical analyses, and 3) communicate the results effectively.

Note: Also offered online

Note: Learning Hours may vary

Requirements: Prerequisite None. Exclusion BIOL 243; CHEE 209; COMM 162; ECON 250; GPHY 247; HSCI 190; KNPE 251; NURS 323; PHED 251; POLS 385; PSYC 202; SOCY 211; STAT 263; STAT 267; STAT 367. One-Way Exclusion May not be taken with or after STAT 269.

Offering Faculty: Faculty of Health Sciences

HSCI 270 Fundamentals of Health Research Methodology Units: 3.00

HSCI 270, Fundamentals of Health Research Methodology will introduce 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. Throughout the course, students will assess various aspects of both qualitative and quantitative research such as research questions, study rationales, study design, replicability/trustworthiness of research reports, and ethics for research involving human subjects.

Note: Also offered online

Note: Learning Hours may vary

Requirements: Minimum 2nd year (Level 2) standing and one of (HSCI 190;STAT 263;BIOL 243;STAM 200;CHEE 209; ECON 250;GPHY 247;KNPE 251;NURS 323;POLS 385;PSYC 202;SOCY 211;STAT 267;STAT 367;COMM 162). Exclusion SOCY 210;GPHY 240; HLTH 252; PSYC 203; EPID 301; HLTH 323

Offering Faculty: Faculty of Health Sciences

HSCI 301 Queen's Undergraduate Internship Program Part I Units: 1.50

Part I of a 12-16 month, professionally supervised, career-related position designed to offer students the opportunity to learn about current advances, practices and technologies in workplaces including business, industry, government, and community settings. Students will develop a range of workplace skills, learn about organizational culture, and expand their knowledge of career options.

Requirements: Minimum 2nd year (Level 2) standing and completion of the Queen's Undergraduate Internship Program pre-departure workshop.

Offering Faculty: Faculty of Health Sciences

HSCI 302 Queen's Undergraduate Internship Program Part II Units: 1.50

Part II of a 12-16 month, professionally supervised, career-related position designed to offer students the opportunity to learn about current advances, practices and technologies in workplaces including business, industry, government, and community settings. Students will develop a range of workplace skills, learn about organizational culture, and expand their knowledge of career options.

Requirements: Minimum 2nd year (Level 2) standing, HSCI 301, and completion of the Queen's Undergraduate Internship Program pre-departure workshop.

Offering Faculty: Faculty of Health Sciences

HSCI 303 Queen's Undergraduate Internship Program (12-month) Part III Units: 3.00

Part III of a 12 month, professionally supervised, career-related position designed to offer students the opportunity to learn about current advances, practices and technologies in workplaces including business, industry, government, and community settings. Students will develop a range of workplace skills, learn about organizational culture, and expand their knowledge of career options.

Requirements: Minimum 2nd year (Level 2) standing, HSCI 301/1.5, HSCI 302/1.5, and completion of the Queen's Undergraduate Internship Program pre-departure workshop.

Offering Faculty: Faculty of Health Sciences

HSCI 304 Queen's Undergraduate Internship Program (16-month) Part III Units: 1.50

Part III of a 16-month, professionally supervised, career-related position designed to offer students the opportunity to learn about current advances, practices and technologies in workplaces including business, industry, government, and community settings. Students will develop a range of workplace skills, learn about organizational culture, and expand their knowledge of career options.

Requirements: Minimum 2nd year (Level 2) standing, HSCI 301/1.5, HSCI 302/1.5, and completion of the Queen's Undergraduate Internship Program pre-departure workshop.

Offering Faculty: Faculty of Health Sciences

HSCI 305 Queen's Undergraduate Internship Program (16-month) Part IV Units: 1.50

Part IV of a 16-month, professionally supervised, career-related position designed to offer students the opportunity to learn about current advances, practices and technologies in workplaces including business, industry, government, and community settings. Students will develop a range of workplace skills, learn about organizational culture, and expand their knowledge of career options.

Requirements: Minimum 2nd year (Level 2) standing, HSCI 301/1.5, HSCI 302/1.5, HSCI 304/1.5, and completion of the Queen's Undergraduate Internship Program pre-departure workshop.

Offering Faculty: Faculty of Health Sciences

HSCI 383 Advanced Research Methodologies Units: 3.00

Students will have the opportunity to develop and apply a mixed methods design for research. The course instruction will assist students as they navigate processes of literature review, question development, experimental design, proposed approaches to data analyses (both quantitative and qualitative) and proposed methods of knowledge mobilization.

Requirements: Minimum 3rd year (Level 3) standing and one of (HSCI 270/3.0; BMED 270/3.0; EPID 301/3.0; HLTH 252/3.0; PSYC 203/3.0; SOCY 210/3.0) or permission of the Instructor.

Offering Faculty: Faculty of Health Sciences

HSCI 483 Applied Qualitative Methods for Health Research Units: 3.00

In this course students will explore multiple qualitative methodologies and methods used to collect and analyze non-numeric behaviours, experiences, and perspectives. This course provides an opportunity to enhance and apply qualitative research skills. Students will design and initiate a qualitative research project on a topical health issue.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (24 Group Learning, 48 Online Activity, 48 Private Study)

Requirements: Prerequisite Level 3 or above and HSCI 383/3.0.

Offering Faculty: Faculty of Health Sciences

HSCI 591 Health Sciences Research: Design and Methods Units: 3.00

This course will allow students to carry out components of a research project in the Health Sciences. Students will gain experience searching relevant literature, developing research questions, establishing and testing hypotheses (where appropriate), designing a research plan and methods. (Note: The primary difference between HSCI 591 (120 hours) and HSCI 598 (240 hours) is the number of hours the student is expected to spend on the project, which corresponds to a lesser scope of the research project in HSCI 591).

Requirements: Minimum 3rd year (Level 3) standing and registration in the BSc program. Exclusion 12.0 units from HSCI 591/3.0; HSCI 592/3.0; HSCI 593/3.0; HSCI 594/3.0; HSCI 595/3.0; HSCI 598/6.0; HSCI 599/6.0.

Offering Faculty: Faculty of Health Sciences

HSCI 592 Health Sciences Research: Design and Methods Units: 3.00

This course will allow students to carry out a research project in the Health Sciences. Students will gain experience searching relevant literature, developing research questions/hypotheses, and designing a research plan and methods.

Requirements: Minimum 3rd year (Level 3) standing and registration in the BSc program. Exclusion 12.0 units from HSCI 591/3.0; HSCI 592/3.0; HSCI 593/3.0; HSCI 594/3.0; HSCI 595/3.0; HSCI 598/6.0; HSCI 599/6.0.

Offering Faculty: Faculty of Health Sciences



HSCI 593 Health Sciences Research: Data Collection and Interpretation Units: 3.00

This course will allow students to carry out a research project in the Health Sciences. Meant to follow HSCI 592/598, students will gain experience answering research questions and/or testing hypotheses using a research plan and methods developed during the initial course, with an emphasis on the development of research skills and practice interpreting data.

Exclusion: no more than 12 units from HSCI 591,592,593,594,595,598,599.

Requirements: Min 3rd or 4th year HSC prog

Offering Faculty: Faculty of Health Sciences

HSCI 594 Health Sciences Research: Data Collection and Interpretation Units: 3.00

"This course will allow students to carry out components of a research project in the Health Sciences. Meant to follow HSCI 591 and 592 or 598, students will gain experience answering research questions, establishing and testing hypotheses (where applicable) using a research plan and methods developed during the initial course, with an emphasis on the development of research skills and practice interpreting data.

(Note: The primary difference between HSCI 594 (120 hours) and HSCI 599 (240 hours) is the number of hours the student is expected to spend on the project, which corresponds to an expected increase in the scope of the research project.)"

Requirements: Min yr 3, 1 of HSCI591,593,598

Offering Faculty: Faculty of Health Sciences

HSCI 595 Health Sciences Research: Data Collection and Interpretation Units: 3.00

This course will allow students to carry out components of a research project in the Health Sciences. Meant to follow HSCI 591/3.0, HSCI 593/3.0, and HSCI 594/3.0 students will gain experience answering research questions, establishing and testing hypotheses (where applicable) using a research plan and methods developed during the initial course, with an emphasis on the development of research skills and practice interpreting data.

(Note: The primary difference between HSCI 595 (120 hours) and HSCI 599 (240 hours) is the number of hours the student is expected to spend on the project, which corresponds to an expected increase in the scope of the research project.)

Requirements: min yr 3, 1 of HSCI591,593,594

Offering Faculty: Faculty of Health Sciences

HSCI 598 Advanced Health Sciences Research: Design and Methods Units: 6.00

This course will allow students to carry out an in-depth research project in the Health Sciences. Students will gain experience searching relevant literature, developing research questions/hypotheses, and designing a research plan and methods, as well as developing preliminary skills in using the methods.

Exclusion: no more than 12 units from HSCI 591,592,593,594,595,598,599.

Requirements: Min 4th year HSC prog

Offering Faculty: Faculty of Health Sciences

HSCI 599 Advanced Health Sciences Research: Data Collection and Analysis Units: 6.00

This course will allow students to carry out an in-depth research project in the Health Sciences. Meant to follow HSCI 592 or 598, students will gain experience answering research questions and/or testing hypotheses using a research plan and methods developed during the initial course, with an emphasis on the development of research skills and practice interpreting data.

Exclusion: no more than 12 units from HSCI 591,592,593,594,595,598,599.

Requirements: Minimum 4th year (level 4) standing, registration in the BHSc Program, one of (HSCI 592/3.0; HSCI 598/6.0)

Offering Faculty: Faculty of Health Sciences

IDIS 173 The 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.

LEARNING HOURS may vary 120(480;72P)

Requirements: Exclusion PHIL 201/3.0 Equivalency BMED 173/3.0

Offering Faculty: Faculty of Health Sciences

IDIS 199 The Science of Mental Health, Well-being, & Resiliency Units: 3.00

A course designed for undergraduate students across all programs. Topics include an overview of conceptual approaches to defining and measuring mental health, mental health problems and mental illness, the impact of sleep habits, distress tolerance and self-regulation on well-being, and an introduction to effective coping choices.

LEARNING HOURS 120(480;72P)

Requirements: Prerequisite None. Exclusion HLTH 102.

Offering Faculty: Faculty of Health Sciences

IDIS 280 Interprofessional Approaches in Healthcare Units: 3.00

This course aims to prepare learners with the knowledge and capabilities for working within complex interprofessional environments common in the healthcare sector. The course introduces the basics of collaborative practice in healthcare and the related six interprofessional competencies.

NOTE Only offered online. Consult Bachelor of Health Sciences program office.

Learning Hours: 120 (96 Online Activity, 24 Private Study)

Requirements: Minimum 2nd year (Level 2) standing or permission of the Instructor.

Offering Faculty: Faculty of Health Sciences

IDIS 373 Health Ethics, Law, and Policy Units: 3.00

An introduction to ethical, legal and regulatory requirements for people working in the health professions.

LEARNING HOURS may vary 120(48O;72P)

Requirements: Minimum 3rd year (Level 3) standing. Equivalency BMED 373.

Offering Faculty: Faculty of Health Sciences

IDIS 473 Designing Life After Queen's Units: 3.00

This upper-year course uses design thinking to help students plan their life and career after university. The course places special emphasis on exploring how education and career choices can contribute to positive social change. It also addresses the realities of engaging with contemporary workplaces.

NOTE Due to the personalized nature of the assignments, this course uses a pass/fail grading system.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (60 Online Activity, 60 Private Study)

Requirements: Prerequisite Level 4 or above.

Offering Faculty: Faculty of Health Sciences

IDIS 480 Advanced Interprofessional Approaches in Healthcare Units: 3.00

This course, the second of two, presents philosophies and methodologies crucial for safe and excellent teamwork in healthcare. It aims to prepare learners with additional knowledge and advanced capabilities to work within complex interprofessional environments, common in diverse workplaces, and indispensable in the healthcare sector. These capabilities, referred to as the 'interprofessional competencies' in The National Interprofessional Competency Framework 1 were introduced previously in IDIS 280.

They will be expanded and applied in greater detail for the advanced learner. In-depth knowledge and complex skill development will be examined in the following areas: theoretical and global frameworks for collaborative practice and health equity; intercultural communication; teamwork processes; communication tools for safe work in healthcare; philosophies of health, wellness and well-being; and collaborative leadership. Models for effective healthcare teams, via the utilization of knowledge and skills from all stakeholders including patient/client, family, and community partnerships, will be introduced on a community and system levels and applied in authentic scenarios. The course is designed as a series of modules that will address these advanced collaborative teamwork competencies. A significant portion of the course assessments will be application-based, leading students to apply the principles of team-based learning and collaborative practice in group situations.

Learning Hours: 120 (72 Online Activity, 48 Private Study)

Requirements: Minimum 4th year (Level 4) standing and IDIS 280/3.0 or permission from the instructor.

Offering Faculty: Faculty of Health Sciences

IDIS 483 Applied Health Ethics: Clinical, Organizational, and Research Perspectives Units: 3.00

Individual and collaborative work prepares students to navigate the complex ethical challenges they will face as they enter diverse professional roles in the health system. Course assessment will be based on a combination of active engagement in course discussion, performance in case-based active learning opportunities, and short written case analyses.

Learning Hours: 120 (24 Lecture, 36 Group Learning, 60 Private Study)

Requirements: Prerequisite (Level 4 or above and IDIS 373/3.0) or permission of the instructor. Note Priority access will be given to students registered in the Bachelor of Health Sciences program.

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 (6 Lecture, 6 Seminar, 33 Group Learning, 33 Online Activity, 48 Private Study)

Requirements: Prerequisite Minimum 3rd year (Level 3) standing and registration in one of (LISC Honours Plan; BCHM Honours Plan; BHSc Program; BIOL Plan; PSYC Plan).

Offering Faculty: Faculty of Health Sciences

LISC 387 Sex Differences in Health and Disease Units: 3.00

This course will focus on the role of sex/gender related differences in etiology, pathogenesis and immune responses of human diseases. Conventional and advanced tools in diagnosis and treatment of diseases affecting men and women.

Learning Hours: 120 (24 Lecture, 12 Seminar, 36 Group Learning, 48 Private Study)

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 270/3.0; MICR 360/3.0; MICR 386/3.0) and BCHM 218/3.0. Exclusion REPD 387/3.0*.

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 210/6.0 or PHGY 214/6.0 or [PHGY 215 and PHGY 216]) and (LISC 391 or PHAR 230 or PHAR 340 or PHAR 370 [formerly PHAR 270/3.0]). Exclusion 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 (36 Laboratory, 36 Online Activity, 36 Private Study)

Requirements: Prerequisite PHGY 210/6.0 or PHGY 214/6.0 or (PHGY 215 and PHGY 216). Exclusion BMED 384.

Offering Faculty: Faculty of Health Sciences

LISC 400 Neuro-Immune Interactions in Health and Disease Units: 3.00

This course is designed to advance critical thinking skills, as well as oral and written communication skills, via an inquiry-based approach in neuroimmunology. Teams of students identify the critical cellular and molecular processes regulating neuro-immune interactions in health and disease.

Learning Hours: 120 (24 Group Learning, 36 Individual Instruction, 36 Online Activity, 24 Private Study)

Requirements: Prerequisite Minimum 3rd year (Level 3) standing, registration in a LISC/BCHM/BHSc Major or SSP, a GPA of 2.5, and one of ([PHGY 290/3.0 and MICR 270/3.0]; LISC 300/3.0; NSCI 323/3.0; NSCI 324/3.0; MICR 360/3.0; MICR 386/3.0).

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: Prerequisite Level 4 or above and registration in the LISC Major or Specialization Plan and a cumulative GPA of 2.50 or higher and (NSCI 323 or NSCI 324).

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: 114 (36 Online Activity, 78 Private Study)

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 (60 Online Activity, 60 Private Study)

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 (36 Laboratory, 48 Online Activity, 36 Private Study)

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 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 451 Viral Pathogenesis Units: 3.00**

This molecular virology course covers viral replication strategies and virus-host interactions, with an emphasis on mechanisms of viral pathogenesis, focusing on human pathogenic viruses such as coronaviruses, hepatitis viruses, HIV, and herpesviruses. Tutorials will be in journal club format with group discussion and analysis of recent literature.

Learning Hours: 120 (24 Lecture, 12 Tutorial, 84 Private Study)

Requirements: Prerequisite Level 3 or above and registration in the LISC Major or Specialization Plan, or BHSc program and a minimum CGPA of 2.50 and (MICR 221/3.0 or MICR 271/3.0) and (BCHM 218/3.0 or BIOL 330/3.0).

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: Prerequisite Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of (MICR 221; MICR 271), and one of (MICR 360; MICR 386).

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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and a minimum grade of A- in one of (MICR 360; MICR 386).

Offering Faculty: Faculty of Health Sciences

MICR 483 Advanced Topics in Infectious Diseases Units: 3.00

This course will examine basic principles of infectious diseases such as Pathophysiology, Epidemiology and Transmission, and Control of Infectious Agents including an emphasis on Antimicrobial Therapy and Resistance. Selected Infectious Disease syndromes will be examined to explore unique host microbe interactions. Students will work through the topics online using interactive multimedia modules.

Student assessment will include weekly online quizzes, group, and individual assignments. Active participation will also form part of student assessment. At the completion of the course, students will have an understanding of the key concepts of emerging topics in infectious diseases.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Requirements: Prerequisite Minimum 4th year (Level 4) standing and one of (MICR 320/3.0; MICR 270/3.0; MICR 221/3.0; MICR 271/3.0), or permission from the instructor. Equivalency BMED 483/3.0*.

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.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (24 Lecture, 24 Group Learning, 36 Online Activity, 24 Off-Campus Activity, 12 Private Study)

Requirements: Prerequisite BIOL 339/3.0 or KNPE 125/3.0 or KNPE 225/3.0 or (PHGY 215/3.0 and PHGY 216/3.0) or PSYC 271/3.0.

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 325 The Science of Psychedelics Units: 3.00

An active learning-based course aimed at providing a thorough scientific perspective on psychedelics. Students will learn about the historical and cultural relevance of psychedelics, their mechanisms of action, and their current and predicted therapeutic use. Emphasis will be placed on rigorously verified knowledge surrounding psychedelic therapy. Course format encourages students to acquire and/or perfect essential learning competencies such as critical thinking, independent learning, problem-solving, communication and teamwork.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office.

Learning Hours: 120 (24 Lecture, 24 Group Learning, 36 Online Activity, 24 Off-Campus Activity, 12 Private Study)

Requirements: Prerequisite Level 3 or above.

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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of (BIOL 243; CHEE 209; COMM 162; ECON 250; GPHY 247; HSCI 190; KNPE 251; NURS 323; POLS 285; PSYC 202; SOCY 211; STAM 200; STAT 263; STAT 267; STAT 367).

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 (36 Lecture, 84 Private Study)

Requirements: Prerequisite Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of (NSCI 323; NSCI 324; ANAT 312; PSYC 271; PSYC 370).

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 (12 Lecture, 24 Seminar, 8 Group Learning, 6 Individual Instruction, 69 Private Study)

Requirements: Prerequisite Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and a minimum grade of B in NSCI 323.

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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of (NSCI 322; NSCI 323; NSCI 324; ANAT 312).

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 (36 Lecture, 36 Laboratory, 42 Private Study)

Requirements: Prerequisite Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of (NSCI 323; NSCI 324), and one of (ANAT 309; ANAT 312).

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 (12 Lecture, 24 Seminar, 72 Private Study)

Requirements: Prerequisite Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and one of (NSCI 322; NSCI 323; NSCI 324; ANAT 312).

Offering Faculty: Faculty of Health Sciences

NSCI 483 Neurobiology of Learning and Memory Units: 3.00

An exploration of brain systems underlying how 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

PATH 111 Data Science Through Visualization Units: 3.00

This blended course is designed to bring awareness and raise excitement in data science. Through different types of visualization students will learn key concepts of data science and big data investigation. The course will also explore examples of how data science is applied to solve problems in various disciplines.

Learning Hours: 120 (12 Lecture, 24 Group Learning, 36 Online Activity, 48 Private Study)

Requirements: Prerequisite None.

Offering Faculty: Faculty of Health Sciences

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

This upper-year health sciences course covers topics relating to the integrated role of clinical biochemists within a healthcare team. Students will critique analytical techniques in the context of various diseases. Through problem-based learning, students will also explore how to identify and troubleshoot issues in laboratory testing.

Learning Hours: 120 (12 Lecture, 12 Tutorial, 36 Online Activity, 60 Private Study)

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, 84 Group Learning, 6 Online Activity, 36 Private Study)

Requirements: Prerequisite BIOL 243/3.0 or ECON 250/3.0 or GPHY 247/3.0 or HSCI 190/3.0 or NURS 323/3.0 or POLS 285/3.0 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 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 permission of the course coordinator.

Requirements: Prerequisite Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and a minimum grade of B in one of (BIOL 205; PATH 310). Exclusion BIOL 441.

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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and PATH 310.

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 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(480;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: 120 (60 Online Activity, 60 Private Study)

Requirements: Minimum 3rd year (Level 3) standing and one of (BCHM 102/3.0; 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 (36 Lecture, 84 Private Study)

Requirements: Prerequisite Level 4 or above and registration in a LISC/BCHM Major or Specialization, ELSC Specialization, or BHSc program, and a CGPA of 2.5 or higher and (PHAR 370/3.0 or BCHM 310/9.0 or BCHM 316/3.0).

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

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: 114 (36 Online Activity, 78 Private Study)

Requirements: One-Way Exclusion KNPE 225/3.0

Offering Faculty: Faculty of Health Sciences

PHGY 215 Principles of Mammalian Physiology I 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 II 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 (36 Laboratory, 48 Online Activity, 36 Private Study)

Requirements: Corequisite Minimum 2nd year (Level 2) standing, registration in a BHSc, LISC, or BCHM program, and co-req PHGY 215/3.0 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 (36 Lecture, 6 Online Activity, 72 Private Study)

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 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 Minimum 4th year (Level 4) standing, registration in a LISC/BHSc Major or SSP, a GPA of 2.5, and a minimum grade of C in one of ([PHGY 215 and PHGY 216]; PHGY 210/6.0; PHGY 214/6.0; PHGY 212/6.0).

Offering Faculty: Faculty of Health Sciences

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: 120 (60 Online Activity, 60 Private Study)

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 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