



UNIVERSITY OF TORONTO
FACULTY OF ARTS & SCIENCE

Undergraduate Sciences Curriculum Committee
November 17, 2017

Science Curriculum Committee

Abbreviated Review Proposals By Unit

Proposals in this package include changes that have been assessed by the Dean's Office to be minor. These are shared with Committee "for information"; questions or feedback regarding any of these proposals may be offered in committee discussion.

1 Course Modification:

AST251H1: Life on Other Worlds

Contact Hours:

Previous: *Lecture:* 24

New: *Lecture:* 24 / *Tutorial:* 12

Prerequisites:

Previous:

New: AST101H1/AST201H1

5 Course Modifications:

BCH210H1: Biochemistry I: Proteins, Lipids and Metabolism

Prerequisites:

Successful completion of (CHM135H1, CHM136H1) ~~(CHM138H1, CHM139H1)~~ / CHM151Y1 NOTE: CHM1** ~~with~~ ~~WITH~~ COURSE EXCLUSION TO CHM135H1 AND CHM136H1 meet the Prerequisite requirement for BCH210H1: ~~SCH** DOES NOT COUNT as a Prerequisite~~. CHM110H5 & CHM120H5 (UTM) are equivalent to ~~CHM135H1~~ ~~CHM135H1~~ ONLY. CHMA10H3 & CHMA11H3 (UTSC) are equivalent to CHM135H1 ONLY. CHMB41H3 / CHMB42H3 (UTSC) are equivalent to CHM136H1 ONLY. CHM242H5 (UTM) is equivalent to CHM136H1 ONLY. Students with a SDF in CHM135H1 / CHM136H1 ~~/CHM138H1/CHM139H1~~ are not permitted to enrol in BCH210H1 until a final passing grade (50%) appears on the transcript.

Exclusions:

BCH242Y1, [CHM361H5 (UTM) and CHM362H5 (UTM)], [BIOC12H3 (UTSC) and BIOC13H3 (UTSC)], ~~CHMB62H3 (UTSC)~~

BCH242Y1: Introduction to Biochemistry

Description:

An introductory course that will serve as the foundation for BCH courses taken in Third and Fourth years by students specializing in biochemistry and related specialist programs. The major topics include protein structure, enzyme mechanisms, cellular and molecular biology, lipid and membrane structure and function, and carbohydrate, lipid, and amino acid metabolism and bioenergetics. Please note that there are five laboratories accompanying this course. (Lab fees: \$10)

Prerequisites:

(CHM135H1, CHM136H1) ~~(CHM138H1, CHM139H1)~~ / CHM151Y1

Exclusions:

BCH210H1 and BCH311H1, [CHM361H5 (UTM) and CHM362H5 (UTM)], [BIOC12H3 (UTSC) and BIOC13H3 (UTSC)], ~~CHMB62H3 (UTSC)~~

BCH370H1: Laboratory Course in Biochemical Techniques

Description:

This course reinforces theoretical principles through experiments that encompass pH and buffers, spectrophotometry, chromatography, protein electrophoresis, enzyme kinetics and DNA isolation and analysis. Intended for students who are not proceeding further in biochemistry. It is highly recommended that students take this course in their third year as space is limited and priority will go to third-year students. cGPA of 2.5 is required for non-Biochemistry Majors and Specialists. This course will be offered in the FALL & WINTER terms. No enrolment will be permitted after the start of class. (Enrolment limited.) (Lab fees: \$50)

BCH377H1: Biochemistry Laboratory I

Description:

An introduction to fundamental laboratory techniques in modern biochemistry. Experiments illustrate and develop the concepts described in lecture courses and serve as a foundation for more advanced training in biochemistry laboratory courses. Enrollment in this course is generally restricted to students enrolled in the Biochemistry, Immunology, and Molecular Genetics & Microbiology (Genetics Stream) Specialist programs. (Lab fees: \$25)

BCH478H1: Advanced Biochemistry Laboratory

Description:

Experiments extend students' technical abilities as well as their knowledge and application of practical theory. This course is designed as an advanced successor in a progression of biochemistry laboratory experiences in BCH242Y1, BCH377H1 and BCH378H1 that will equip students with a spectrum of practical abilities that are of vital importance in scientific research. (Lab fees: \$25) ~~research:~~

23 Course Modifications:

BIO255H1: Cell and Molecular Biology with Advanced Laboratory

Abbreviated Title:

Advanced Cell & Molec Bio Mol

CSB201H1: Molecular Biology, Biotechnology and You

Abbreviated Title:

Molec Mol Bio , Biotech & You

CSB202H1: Further Exploration in Biotechnology

Abbreviated Title:

Explore Biotechnology Biotechnol

CSB299Y1: Research Opportunity Program

Abbreviated Title:

Research Rsch Opportunity Prg

CSB327H1: Extracellular Matrix Dynamics and Associated Pathologies

Abbreviated Title:

Matrix Dynamic Pathologies Patho

CSB330H1: Techniques in Molecular and Cell Biology

Abbreviated Title:

Molec Tech Mol & Cell Bio Techniques

CSB348H1: Laboratory in Comparative Animal Physiology

Abbreviated Title:

Lab in Comparative Comp Animal Phys

Contact Hours:

Previous: *Lecture:* 12 / *Practical:* 36

New: *Practical:* 48

CSB349H1: Eukaryotic Gene Expression

Abbreviated Title:

Eukaryotic Gene Expression Express

CSB351Y1: Introductory Virology

Abbreviated Title:

Introductory Introdect Virology

CSB399Y1: Research Opportunity Program

Abbreviated Title:

Research **Rsch** Opportunity Prg

CSB427H1: Drosophila as a Model in Cancer Research

Abbreviated Title:

Drosophila **Model of &** Cancer

CSB428H1: Advanced Cell Biology II: Cell Polarity and Cytoskeletal Dynamics

Description:

This advanced course covers cell polarity and cytoskeletal dynamics emphasizing current literature. For each topic, the course examines (1) the proteins involved, (2) their interactions and regulation, and (3) how they organize specific cellular structures. The coordination of these complexes required for orchestrating complex cellular processes are **addressed**. **These important topics of cell biology are pursued with question-driven lectures, and both round-table discussions and group presentations of research papers. addressed.**

Prerequisites:

Minimum grade of 73% in BCH311H1/CSB349H1/MGY311Y1, minimum grade of 73% in CSB328H1/**CSB329H1/**CSB331H1/CSB340H1

CSB432H1: Advanced Topics in Cellular Neurophysiology

Abbreviated Title:

Advanced **Neurophysiology Neurophys**

CSB435H1: Regulatory Networks and Systems in Molecular Biology

Abbreviated Title:

Regul Networks Reg Net In Molec Bio

CSB445H1: Topics in Sleep Research

Abbreviated Title:

Topics in Topic Sleep Research

CSB450H1: Proteomics in Systems Biology

Abbreviated Title:

Proteomics in **Systems Biology Sys Bio**

CSB452H1: Molecular Plant-Microorganism Interactions

Abbreviated Title:

Mol Plant-Microb **Interactions Int**

CSB460H1: Plant Signal Transduction

Abbreviated Title:

Plant Signal **Transduction** ~~Trans~~

CSB472H1: Computational Genomics and Bioinformatics

Abbreviated Title:

Compu ~~Comp~~ Genomics **Bioinformatics** ~~Bioinf~~

CSB474H1: Methods in Genomics and Proteomics

Abbreviated Title:

Previous: Meth Genome Proteome

New: Genomic & Proteomic Methods

CSB490H1: Team-Based Learning: Current Topics in Cell and Molecular Biology

Abbreviated Title:

Team Learn : ~~FBL~~ Cell and Molec Bio

CSB491H1: Team-Based Research: Research in Cell and Molecular Biology

Abbreviated Title:

Team Research : ~~FBR~~ Cell and Molec

Description:

Previous:

CSB491H1 will build on the team-based learning approaches learned in CSB490H1 to develop the laboratory and team-work skills needed to succeed in the workplace, particularly the multi-disciplinary environment that characterizes modern biological research. CSB491H1 is a team-based research course with emphasis on questions in the fields of protein biochemistry, enzymology, structural biology, metabolic engineering and protein-protein interaction. Students will form semester-long laboratory research teams to evaluate hypotheses that were developed into a research proposal in CSB490H1.

New:

CSB491H1 will build on molecular biology and biochemistry approaches acquired in CSB350H1 to investigate the role of metabolic enzymes in plants. Students participating in this course will develop laboratory and team-work skills that are desirable for them to function in a research laboratory and in the workplace. The course will integrate current molecular biology techniques, including designing and characterizing mutants made with CRISPR / Cas9, identifying protein interactors, and performing structural and mechanistic analysis of metabolic enzymes.

Prerequisites:

CSB350H1 ~~CSB490H1~~ with a minimum grade of 77% and approval of the instructor

CSB497H1: Independent Research in Cell and Systems Biology I

Description:

Cell and Systems Biology (FAS), Department of

An original research project (a literature review alone is not sufficient) requiring the prior consent of a member of the Department to supervise the project. The topic is to be mutually agreed upon by the student and supervisor. They must arrange the time, place, and provision of any materials and submit to the Undergraduate Office a signed form of agreement outlining details prior to being enrolled. In the Fall or Winter sessions, a commitment of 8-10 hours per week is expected for research and related course activities. **If spread over both the Fall and Winter sessions, a commitment of 4-5 hours per week is expected.** In the Summer Session, the number of hours doubles (~~16-20~~ per week (e.g., 16-20 for F or S, or 8-10 for Y) as the length of the term is halved **compared to the Fall or Winter term.** Many students spend more than this amount of time as they become immersed in their project. This course is normally open only to fourth year students with adequate background in Cell and Systems Biology. Course requirements include a final report, and either an oral presentation (Summer and Fall sessions) or a poster presentation (Winter session). Monthly workshops are scheduled and highly recommended. Details for enrollment are available at <http://csb.utoronto.ca/undergraduate-studies/undergraduate-courses/undergraduate-course-level-400/>. (Lab Materials Fee:\$25). Not eligible for CR/NCR option.

1 Course Modification:

CHM222H1: Introduction to Physical Chemistry (formerly CHM225Y1)

Exclusions:

CHM220H1/CHM225Y1, CHMB20H3; **CHMB21H3**, CHM221H5, JCP221H5

1 Course Modification:

CSC343H1: Introduction to Databases

Exclusions:

Previous: CSC434H1

New: CSC443H1

1 Course Modification:

ESS311H1: Aqueous Geochemistry

Title:

Earth System Chemistry 2 : Aqueous Geochemistry

12 Course Modifications:

EEB214H1: Evolution and Adaptation

Exclusions:

BIO120H1/~~BIO150Y1~~

EEB215H1: Conservation Biology

Exclusions:

BIO120H1/~~BIO150Y1~~

EEB255H1: Essentials of Biodiversity Science and Conservation Biology

Title:

Essentials ~~Essentials~~ of Biodiversity Science and Conservation Biology

EEB263H1: Comparative Vertebrate Anatomy

Exclusions:

Previous: EEB263Y1

New:

EEB266H1: Animal Diversity: Invertebrates

Exclusions:

Previous: EEB265Y1

New:

EEB267H1: Animal Diversity: Vertebrates

Exclusions:

Previous: EEB265Y1

New:

EEB319H1: Population Ecology

Description:

Abundance and distribution of populations; population growth and regulation; fluctuations, stochasticity and chaos; meta-population persistence and extinction; age and stage-structured populations; interactions within and between species; optimal harvesting; spread of infectious diseases. Labs include experiments and computer simulations. (Lab materials fee: \$25 = ~~will not be charged in 2016-17~~)

EEB362H1: Macroevolution

Description:

Extended periods of time. Integrate information from paleontology, phylogenetic patterns with field and experimental studies, functional biology, and experiments to link emergent evolutionary patterns to underlying evolutionary processes. Topics include: speciation origins of species and their adaptations; historical biogeography, phylogenetic inference co-evolution, adaptive vs. non-adaptive community evolution, evolutionary constraints radiations and extinctions, diversification fossils and extinction, evolutionary innovations, historical biogeography macroevolutionary patterns, and the relationship between role of evolutionary history information in conservation and ecology biodiversity initiatives. Tutorials will illustrate common analytical approaches emphasize methods used to macroevolutionary investigation reconstruct phylogenetic relationships and provide in-depth exploration the sequence of landmark studies in macroevolution. character evolution.

EEB460H1: Molecular Evolution and Genomics

Contact Hours:

Previous: *Lecture*: 24 / *Tutorial*: 12

New: *Lecture*: 36

EEB466H1: Approaches to the Study of Biodiversity

Prerequisites:

BIO220H1; EEB365H1 (highly recommended) or at least one organismal course from EEB266H1; EEB267H1; EEB268H1; EEB330H1; EEB331H1/EEB365H1; EEB380H1; EEB382H1; EEB384H1; EEB386H1; EEB388H1

EEB495H1: Seminar in Ecology and Evolutionary Biology

Exclusions:

Previous: EEB496H1

New: EEB496H1; EEB495H1 F (If taken in Fall session)

ENV234H1: Environmental Biology: Structure and Function of Ecosystems (formerly ENV234Y1)

Description:

This multidisciplinary course draws on elements from geology, soil science, and ecology to understand past and present environments and human impacts on landscapes and ecosystems. Emphasis on the structure, functioning and connectivity of aquatic and terrestrial ecosystems. Field trips and labs. Mandatory day-long field trip on a Friday or Saturday in late September or early October (students choose which day; a small fee of approximately \$15 may be charged for field trip transportation.) (Lab Materials Fee:\$25)

20 Course Modifications:

CJH332H1: Neurobiology of the Synapse (Formerly CSB332H1)

Title:

Cellular and Molecular Neurobiology of the Synapse(Formerly CSB332H1)

Description:

Examination of all aspects of the synapse in both the peripheral and central nervous systems of invertebrates and vertebrates. Topics include:neuroplasticity, synapse formation, synaptic transmission, synaptic modulation plasticity; learning and memory, and the molecular biological basis of neurodegenerative neurological disorders.

HMB200H1: Introduction to Neuroscience

Exclusions:

Previous: HMB220H1

New:

HMB202H1: Introduction to Health and Disease

Description:

An introductory course in Health and Disease using an interdisciplinary approach that integrates bacteriology and virology with other aspects of developmental human biology, including chronic disease and neoplasia with perspectives from the Social Sciences. An exploration of the key concepts and approaches that are necessary for understanding the dynamic nexus of human health and disease.(Lab Fees:\$50)

HMB203H1: Introduction to Global Health

Description:

An introductory course covering the theories, operational components and strategies of implementing primary health care in resource-poor settings developing countries. Topics may include education, control of vector-borne vector borne diseases, essential drug provision, maternal and child health, and nutrition, and incorporation of alternative and complementary technologies, community participation and deployment of health service providers providers:

HMB310H1: Laboratory in Neuroscience

Description:

A laboratory course based on current research techniques for students in the Neuroscience program Specialist and Major programs. Lab topics may include human brain imaging and disorders disorders; animal behaviour, electrophysiology, and cell culture, culture; and changes in gene expression during neuronal microarray analysis of neural development.(Lab

Proposals Pertaining to Freestanding Programs

Materials Fee:\$51)

Prerequisites:

9 FCE complete, HMB200H1/~~HMB220H1~~/PSY290H1, HMB265H1/BIO260H1, BIO230H1/BIO255H1

Exclusions:

~~PSY399H1~~/HMB311H1/HMB312H1/HMB314H1

HMB311H1: Laboratory in Fundamental Genetics and its Applications

Contact Hours:

Previous: *Lecture:* 12 / *Practical:* 36

New: *Lecture:* 11 / *Practical:* 36

Description:

A laboratory course based on current research techniques for students in the Fundamental Genetics and its Applications ~~specialist and major~~ programs. Lab topics may include ~~basic microbiology~~; molecular biology and animal cell culture techniques, nutrigenomics; ~~an overview and microarray analysis~~ of microarrays and a ~~CRISPR module altered gene expression~~.(Lab Materials Fee:\$51)

HMB320H1: Neuroanatomy

Contact Hours:

Previous: *Lecture:* 24 / *Practical:* 16 / *Tutorial:* 8

New: *Lecture:* 24 / *Practical:* 10 / *Tutorial:* 4

Description:

This is a rigorous, introductory course that ~~addresses presents~~ the ~~structure functional and comparative anatomy~~ of the vertebrate ~~central nervous system with an emphasis on functional human neuroanatomy brain~~. It is designed for students who intend to continue with studies in the Neurosciences and related areas.

Prerequisites:

9 FCE complete, PSL300H1, HMB200H1/~~HMB220H1~~/PSY290H1, BIO230H1/BIO255H1

HMB322H1: Topics in Health & Disease

Prerequisites:

9 FCE complete, ~~HMB202H1/HMB203H1/HMB204H1~~, BIO230H1/BIO255H1, PSL300H1

HMB360H1: Neurogenomics

Description:

Genetic basis of ~~both the normal and abnormal development function~~ of the nervous system and its function. ~~Topics Lecture topics~~ include ~~the regulation of neural gene expression, the role regulation~~ of epigenetics on ~~chromatin and neuron~~

Proposals Pertaining to Freestanding Programs

function, genome wide association studies and disorders of brain and behaviour, optogenetic and pharmacogenetic techniques to probe neural circuit function. Tutorials emphasize critical analysis of primary research.

Prerequisites:

9 FCE complete; ~~HMB200H1/HMB201H1/HMB220H1/PSY290H1~~, HMB265H1/BIO260H1, HMB200H1/HMB201H1

HMB422H1: Seminar in Health & Disease

Description:

Previous:

This course focuses on current medical research related to human disease . Faculty from the Department of Anesthesia, Faculty of Medicine present their own preoperative research. The potentially profound health effects of anesthesia, pain management, and the control of the cardiorespiratory system essential for most surgery are also highlighted.< / p>

New:

This course focuses on various medical research related to human disease . Topics vary based on course instructor ' s area (s) of expertise.< / p>

Prerequisites:

14 FCE complete, PSL300H1, PSL301H1, HMB302H1/~~HMB322H1~~, and HMB202H1 ~~HMB312H1/HMB203H1~~ · ~~HMB314H1/HMB204H1~~ ~~HMB322H1~~

HMB452H1: Personalized Medicine

Description:

Previous:

Clinical medicine is making rapid progress in predicting individual patients' disease risk, prevention, diagnosis and treatment . This new health care delivery requires overcoming major science and policy challenges to pave the way for its navigation by professionals and patients. Focus is on the significance of current breakthrough applications (e.g., nanoscale DNA sequencing) .< / p>

New:

The bridge between basic scientific research and clinical practice integrates fundamental knowledge about molecular / cellular mechanisms and clinical disorders to increase the potential for new medical treatments, therapies and interventions as well as understanding of disease processes . Specific topics vary from year to year and will be based on the course instructor ' s area (s) of expertise.

Prerequisites:

14 FCE complete, HMB302H1/~~HMB312H1/HMB321H1~~ ~~HMB314H1/HMB322H1~~, HMB201H1/HMB202H1/~~HMB203H1/HMB204H1~~

HMB470H1: Exercise and Sports Medicine

Prerequisites:

14 FCE complete, PSL300H1, PSL301H1, ~~HMB200H1/HMB201H1/HMB202H1/HMB203H1/HMB204H1~~ a · ~~HMB300-level course~~

Proposals Pertaining to Freestanding Programs

HMB471H1: Performance Enhancement

Prerequisites:

14 FCE complete, PSL300H1, HMB200H1/HMB201H1/HMB202H1/HMB203H1/HMB204H1 a HMB 300-level course

HMB472H1: Exercise Physiology

Prerequisites:

14 FCE complete, PSL300H1, PSL301H1, HMB200H1/HMB201H1/HMB202H1/HMB203H1/HMB204H1 a HMB300-level course

HMB473H1: Exercise and Mental Health

Description:

This course, featuring a service-learning component, discusses how mental well-being is a critical element of total health. We explore the evidence underpinning the role of physical activity in the avoidance of mental disorders, recovery from mental disorders, and the quality of life of those with or without mental disorders.

A short application to enrol in this course is required. Information may be found via the [Human Biology Program website](#)

Prerequisites:

14 FCE complete, PSL300H1, PSL301H1; a HMB300-level course

HMB474H1: Dental Sciences

Description:

Dentistry is one of the oldest branches of medicine responsible for the treatment of diseases of oral cavity. This course will introduce students to the key concepts as well as the latest research in the dental sciences, including but not limited to craniofacial structures, bone physiology, odontogenesis, pathogenesis of oral diseases, and technology in dental sciences.

Prerequisites:

14 FCE Complete, BIO230H1/BIO255H1, PSL300H1, PSL301H1, HMB200H1/HMB201H1/HMB203H1/HMB202H1/HMB204H1

HMB489H1: Advanced Laboratory in Human Biology

Description:

Building on their experience in 3rd-year labs, students participate in inquiry-based laboratory experiments in diverse areas

Proposals Pertaining to Freestanding Programs

of current human biology research. Open to students in any Human Biology program. Please see [Human Biology Program Website for subtopic details](#) , which vary from year to year.(Lab Materials Fee:\$51)

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HMB496Y1: Research Project in Human Biology

Description:

A **An independent** research project course for students enrolled in a Human Biology program, is supervised by a faculty member appointed in a faculty or division at St. George Campus (Faculties of the Faculty of Arts & and Science, or the Faculty of Medicine, Engineering, Dalla Lana School of Public Health, etc.). Open to third and fourth year students.

Students are responsible **Not eligible** for securing their own supervisor **CR/NCR option**. Should a HMB Specialist require help securing a supervisor, the request must be made by email to the Human Biology Program Office no later than July 20 for Academic year projects and January 30 for Summer projects.

Completed applications **Applications** for this course are due to the Human Biology Program Office by September 1 for Academic year projects and May 1 for Summer projects. Please see **no later than 15 days prior to** the application on the [Special Enrolment Courses page on the HMB Website](#) .

Not eligible for CR/NCR option. **first day of summer F-term**.

Prerequisites:

Previous: 9 FCE complete, a 300+ level laboratory course, HMB200H1 / HMB201H1/ HMB202H1/ HMB203H1/ HMB204H1, HMB265H1/BIO260H1, BIO230H1, cGPA 3.0 or higher (if you are a 3rd year student) / cGPA 2.5 or higher (if you are a, and permission of the Human Biology Program

New: Permission of the Human Biology Program; please refer to the Human Biology Program website for more details

Exclusions:

Students are not permitted to do a HMB research project concurrently with another **research project and students are allowed to do no more than 2.0 FCE from HMB-coded** research project **courses**.

Recommended Preparation:

Previous: 0.5 FCE or more in any statistics course

New:

HMB499Y1: Research Project in Human Biology II

Description:

A research project course for students enrolled in a Human Biology program, is supervised by a faculty member appointed

Proposals Pertaining to Freestanding Programs

in a faculty or division at St. George Campus (Faculties of the Faculty of Arts & Science, or the Faculty of Medicine, Engineering, Dalla Lana School of Public Health, etc.) **Not eligible for CR/NCR option.**

Students **Applications for this course** are responsible for securing their own supervisor. Should a HMB Specialist require help securing a supervisor, the request must be made by email **due** to the Human Biology Program Office no later than July 20 for Academic year projects and January 30 for Summer projects.

Completed applications for this course are due **15 days prior** to the first day of F-term. For more information please check the [Human Biology Program Office by September 1 for Academic year projects and May 1 for Summer projects. Please see the application on the ~~Special Enrolment Courses page on the HMB Website website~~.](#)

Not eligible for CR/NCR option.

Prerequisites:

HMB496Y1, and permission of the program

Exclusions:

Students are not permitted to do a HMB research project concurrently with another **research project and students are allowed to do no more than 2.0 FCE from HMB-coded research project. courses.**

Recommended Preparation:

Previous: 0.5 FCE or more in any statistics course

New:

JHA410H1: Clinical Neuroimaging

Prerequisites:

9 FCE complete, PSL300H1, BIO230H1, HMB200H1/~~HMB220H1~~/PSY290H1/ANA300Y1

Recommended Preparation:

Previous:

New: HMB320H1

1 Course Modification:

MGY428H1: Functional Genomics

Description:

A broad-ranging **broad ranging** course that covers many aspects of genomics and functional genomics, which is the discipline of defining and attributing function to all of the heritable material of an organism on a genome-wide scale, as applied to **microbes**, invertebrates and vertebrates. The primary and review literature will be the basis of all lectures.

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3 Course Modifications:

PCL366H1: Basic Pharmacology and Toxicology Laboratory

Description:

Through practical hands-on laboratory experiments and tutorials, students will be introduced to some basic experimental techniques and laboratory skills that are used within pharmacology and toxicology research. (Ancillary lab fee \$25) This course results from the splitting of PCL365Y and PCL471Y and provides students an opportunity to develop introductory and basic laboratory skills.

PCL461H1: Advanced Pharmacology Laboratory

Title:

Advanced Pharmacology and Toxicology Laboratory

Abbreviated Title:

Adv Pharm & Tox Pharmacology Lab

Description:

Advanced laboratory exercises and discussions through tutorials and presentations in selected areas of pharmacology. Enrollment in this course is generally restricted to students enrolled in the Pharmacology Specialist and Pharmacology and Biomedical Toxicology Specialist programs. (Ancillary lab fee \$25). programs.

PCL491H1: Clinical Pharmacology Principles and Practice

Description:

This course will examine the practical and experimental aspects of clinical pharmacology and toxicology. Through practical applications and experiments, students will develop their knowledge in Good Laboratory Practice/Good Clinical Practice, critical evaluation and analysis skills through: performing pharmacokinetic experiments (evaluating V_d, half-life, and clearance); examining case studies and primary literature in regards to drug-drug interactions and adverse drug reactions. reactions.

This elective course can apply towards their program requirements in our Specialist and Major streams and will only be available to fourth year students. The course will meet a need expanding students comprehension in clinical pharmacology and pharmacokinetics in a hands-on practical and advanced manner. Students will be evaluated on both written and oral communication skills, team work as well as data analysis and interpretation and critical thinking skills.

(Ancillary lab fee \$25)

Recommended Preparation:

PCL469H1/; PCL470H1/or PCL473Y1. Completion of an upper level laboratory course (PCL366H1/; PSL372H1/; BCH370H1)

8 Course Modifications:

ENV237H1: Physics of the Changing Environment A

Description:

The course will cover basic physics of environmental processes and of measurement techniques in the atmosphere, the ocean, lake-land-forest systems, and other biological systems. It will place its work in the context of climate change and other aspects of environmental change. This course is solely intended for students **in the Environmental Science Major program** who have NOT completed a previous first year physics core course, who are in one of the following programs: Environmental Science Major, Environmental Geosciences Specialist or Earth and Environmental Systems Major. ~~course.~~

ENV238H1: Physics of the Changing Environment B

Description:

The course will cover basic physics of environmental processes and of measurement techniques in the atmosphere, the ocean, lake-land-forest systems, and other biological systems. It will place its work in the context of climate change and other aspects of environmental change. This course is solely intended for students **in the Environmental Science Major program** who have completed a previous first year physics core course, who are in one of the following programs: Environmental Science Major, Environmental Geosciences Specialist or Earth and Environmental Systems Major. ~~course.~~

PHY254H1: Mechanics: From Oscillations to Chaos

Title:

Previous: Mechanics : From Oscillations to Chaos

New: Classical Mechanics

Abbreviated Title:

Classical Mechanics ~~Osci Chaos~~

Prerequisites:

PHY132H1/PHY152H1(PHY152H1 recommended), (MAT135H1, MAT136H1)/ MAT137Y1/MAT157Y1

Recommended Preparation:

MAT244H1/MAT267H1, PHY224H1

PHY354H1: Classical Mechanics

Title:

Advanced Classical Mechanics

PHY392H1: Physics of Climate

Prerequisites:

~~PHY231H1~~/PHY250H1/**PHY252H1**, MAT235Y1/MAT237Y1/MAT257Y1

PHY407H1: Computational Physics

Corequisites:

Any ~~PHY300-level lecture course in Physics~~: ~~PHY407H1~~ may be taken in third or fourth year course in Physics

PHY408H1: Time Series Analysis

Corequisites:

Any third or fourth year ~~third-year~~ lecture course in Physics

PHY487H1: Condensed Matter Physics

Description:

Introduction to ~~foundational~~ ~~the~~ concepts of condensed matter physics ~~used~~ in the solid state ~~modern treatment of solids~~. Main topics ~~The student is assumed~~ to be covered ~~familiar with elementary quantum mechanics~~: Topics include: crystal structure, ~~the~~ reciprocal lattice, x-ray diffraction, crystal binding, lattice vibrations ~~the free electron model~~, phonons and electrons in solids ~~periodic potential~~, Fermi surfaces ~~lattice vibrations~~, energy bands ~~electrons and holes~~, semiconductors and magnetism. Special topics to be surveyed: superconductivity and nanoelectronic transport.; ~~metals~~.

Prerequisites:

PHY256H1 ~~PHY356H1~~, PHY252H1, PHY250H1

3 Course Modifications:

STA304H1: Surveys, Sampling and Observational Data (formerly STA322H1)

Prerequisites:

ECO220Y1/ECO227Y1/GGR270H1/PSY201H1/SOC300H1/SOC202H1/STA220H1/STA255H1/STA261H1/
STA248H1/STA238H1/EEB225H1

STA347H1: Probability

Prerequisites:

STA247H1/STA255H1 (70%)/STA237H1 (70%)/STA257H1/ECO227Y1, MAT223H1/MAT240H1, MAT240H1;
MAT235Y1/MAT237Y1/MAT257Y1(Note:STA257H1 and MAT237Y1/MAT257Y1; (MAT223H1, MAT224H1)/
MAT240H1 are very strongly recommended)

STA490Y1: Statistical Consultation, Communication, and Collaboration (formerly STA490H1)

Prerequisites:

STA303H1, STA304H1/STA305H1, STA355H1(Permission **permission** of instructor. Priority is given to students
completing all requirements of the Applied Statistics specialist program.)