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**

<table>
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<tr>
<th>Contact Hours:</th>
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<td><strong>Previous:</strong> Lecture: 24</td>
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<td><strong>New:</strong> Lecture: 24 / Tutorial: 12</td>
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<th>Prerequisites:</th>
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<td><strong>Previous:</strong></td>
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<td><strong>New:</strong> AST101H1/AST201H1</td>
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5 Course Modifications:

BCH210H1: Biochemistry I: Proteins, Lipids and Metabolism

Prerequisites:
Successful completion of (CHM135H1, CHM136H1)/(CHM138H1, CHM139H1)/(CHM151Y1) NOTE: CHM1** with COURSE EXCLUSION TO CHM135H1 AND CHM136H1 meet the Prerequisite requirement for BCH210H1: CHM135H1/CHM136H1 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)
### 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 Introduct Virology |
CSB399Y1: Research Opportunity Program

Abbreviated Title:
Research 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.

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 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

CSB472H1: Computational Genomics and Bioinformatics

Abbreviated Title:
Computational Genomics Bioinformatics

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: TBL Cell and Molec Bio

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

Abbreviated Title:
Team Research: TBR 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:
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)**

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<td>CHM220H1/CHM225Y1, CHM20H3, CHMB2H3, CHM221H5, JCP22H5</td>
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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 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; metapopulation 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:
Explores patterns and processes of large-scale evolutionary change, played out over large geographic expanses and extended periods of time. Integrates information from paleontology, phylogenetics, patterns with field and experimental studies, functional biology, and experiments to link emergent evolutionary patterns to underlying 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)
Proposals Pertaining to Freestanding Programs

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 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.

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; animal behaviour, electrophysiology, and cell culture; 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.

**New:**

This course focuses on various medical research related to human disease. Topics vary based on course instructor’s area(s) of expertise.

**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).

**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

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)

HMB496Y1: Research Project in Human Biology

Description:

A **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...
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.) 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.

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 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.
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).

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: evaluating Vd, half-life, and clearance; examining case studies and primary literature in regards to drug-drug interactions and adverse drug 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 advance 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.

## 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.

## PHY254H1: Mechanics: From Oscillations to Chaos

**Title:**

Previous: Mechanics : From Oscillations to Chaos  
New: Classical Mechanics

**Abbreviated Title:**

Classical Mechanics Oscil 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:**

PHY23H1/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/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 of instructor. Priority is given to students
  completing all requirements of the Applied Statistics specialist program.)