ECO423H1: Topics in Economics, Biology and Genetics

**Contact Hours**
- Lecture: 24
- Seminar: Practical: Tutorial: 12

**Description**
This course explores topics at the intersection of economics, biology, and genetics. Sample topics include the evolution of economic preferences; the nature and nurture of economic behavior and outcomes; the discovery of specific genetic variants associated with various economic traits; and the policy implications (or lack thereof) of related findings. No previous background in biology or genetics is required.

**Prerequisites**
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA220H1,STA255H1)/(STA257H1,STA261H1); at least 1.0 ECO FCE at the 300+ level; or permission of the instructor.

**Corequisites**

**Exclusions**
ECO422H1S (winter 2017)

**Recommended**
ECO374H1/ECO375H1

**Competency Levels**
- **Critical and Creative Thinking:** extensively
- **Quantitative Reasoning:** extensively
- **Communication:** notably
- **Social and Ethical Responsibility:** slightly
- **Information Literacy:** notably

**Experiential Learning**
- **Research:** none
- **Other:** none

**Nature of "Other" Experiential Learning:** None selected

**Distribution Requirements**
Social Science

**Breadth Requirements**
Society and its Institutions (3)

**Credit Value**
Fixed: 0.5

**Student May Select Credit/No Credit**
Y

**Rationale**
This course was first introduced in 2016-2017 under a Special Topics number, ECO 422H1S, by a new faculty member and is now receiving its own number. This course broadens the student's understanding of Economics as it touches and affects biology and genetics; it complements a roster of social science programs; it also expands the number of 400 level ECO course offerings for students to complete their Major and Specialist programs.

**Resource Implications**

**Resource Budget**
Academic Unit will provide the resources required for this course from their existing budget.
JHA410H1- Clinical Neuroimaging
Impact on Programs
This proposal triggers modifications in the unit's program(s)

Contact Hours Lecture: 24 Seminar: Practical: Tutorial: 12
Description This course focuses on the use of neuroimaging techniques in understanding how trauma, disorders, and disease impact neural structure and function. Lectures will focus on local and long range neural impact of pathology and neuroimaging assessment. Lab work will focus on practical skills including image processing, analyses, and experimental design.

Prerequisites 9 FCE complete, PSL300H1, BIO230H1, HMB200H1/ HMB220H1/ PSY290H1/ ANA300Y1
Corequisites -
Exclusions -
Recommended Preparation
Competency Levels
Critical and Creative Thinking: extensively
Quantitative Reasoning: extensively
Communication: slightly
Social and Ethical Responsibility: slightly
Information Literacy: extensively

Proposal Details
Experiential Learning
Research: notably Other: none
Nature of "Other" Experiential Learning: None selected
Distribution Requirements
Science
Breadth Requirements
Living Things and Their Environment (4)
Credit Value Fixed: 0.5
Student May Select Credit/No Credit Y
Rationale Neuroimaging is increasingly used in clinical and research neuroscience. Neuroimaging merges neuroanatomy with local and widespread neural activities in the understanding of brain function. It forms the basis of information acquired through neuroimaging techniques and provides insight into the relationship between neural structure and function in healthy and clinical populations. Traditionally, studies in neural structure and function focused on determining localized characteristics in task-specific regions. More recently neuroscience has developed greater insight into neural function by studying the interaction of distinct anatomical brain regions. Overall, major advances in neuroimaging provide us new opportunities to study the pathophysiological mechanisms underlying neurological and psychiatric diseases. Emerging techniques also have the potential to be tremendously useful in clinical research and neuroscience.
Based on the importance of understanding how trauma, disorders, and disease leads to changes in neural structure and function, we propose to add a clinical neuroimaging course. Lectures would focus on pathologies that highlight changes in brain states and the neuroimaging techniques and data acquisition/analyses used to assess them. Lab work will focus on obtaining practical skills required to carry out high-quality brain imaging processing and analyses as well as experimental design.
Ultimately, this course would provide a solid foundation in neural structure-function relations, neuroimaging techniques, experimental design, and data acquisition/analysis. Moreover, it would provide students an opportunity to synthesize information from other neuroscience courses focusing on neuroanatomy, neurophysiology, and information processing.

Currently, the neuroscience program at the University of Toronto, Faculty of Arts and Science does not require students enrolled in the major program to take a neuroanatomy course. This is due to
limited enrollment capabilities in the current neuroanatomy course: HMB320H1 (Neuroanatomy), which features practicum lab sections as part of the course. However, by changing to a Type 2 L program, and with the expansion of the labs for HMB320H1 which will double enrolment in the course, and by offering this new course, the neuroscience program will be able to guarantee that every neuroscience student graduates from the program possessing a strong neuroanatomical knowledge, which will equip them as researchers beyond undergraduate studies.

Specialists will be required to take both HMB320H1 and AJH400H1, as the two courses complement each other, and will allow specialist to develop a deeper understanding not only of neuro-structure and -function, but how to apply that knowledge to analysis tools that are increasingly used in neuroscience. It should be noted that ANA300Y1Y will be allowed as a third option for major students who will be required to take 0.5 FCE from HMB320H1/ AJH400H1/ ANA300Y1. This is because ANA300Y1 has six weeks of neuroanatomy, and is often used course for other programs, allowing a larger degree of flexibility for major students.

**Resource Implications**

1 instructor, TAs (1 per every 20 students), computer lab space for practical application of neuroimaging software.

**Resource Budget** Academic Unit will provide the resources required for this course from their existing budget.