# 1 New Course:

**BCH450H1: Antibiotics and Antibiotic Targets**

**Impact on Programs:**
This proposal triggers modifications in the unit's program(s)

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

**Description:**
This course will cover the action of the biochemical targets of the existing antibiotics (nucleotide-, RNA-, DNA-,
protein- and cell wall synthesis, the manner in which these pathways are inhibited in antimicrobial therapy and the
biochemical basis of antibiotic resistance. The biochemistry and origin of naturally occurring and synthetic antibiotics
will be introduced. (Enrolment limited.)

**Prerequisites:**
- BCH242Y1/(BCH210H1, BCH311H1)

**Corequisites:**

**Exclusions:**
- BCH350H1

**Recommended Preparation:**

**Breadth Requirements:**
- Living Things and Their Environment (4)

**Distribution Requirements:**
- Science

**Competencies:**
- **Communication:** notably; **Critical and Creative Thinking:** extensively; **Information Literacy:** notably
- **Quantitative Reasoning:** none; **Social and Ethical Responsibility:** slightly

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

**Rationale:**
Changing BCH350H1 numbering to the 400-level (BCH450H1) is to align it with the rest of the BCH electives (which
are all 400-level courses). This minor change is to avoid student confusion and to better reflect the similarities in
course content between this course and our other electives. It is unclear why it was ever given a 300-level designation
as many of our other 400-level electives have similar pre-reqs.

**Consultation:**
Discussed at the Fall Life Sciences Planning Meeting.

**Resources:**
- **Budget Implications:** The academic unit will provide the resources required for this course from existing budget.

**Overlap with Existing Courses:**

Biochemistry (MED), Department of

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<td>Justin Nodwell</td>
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1 Retired Course:

**BCH350H1: Antibiotics and Antibiotic Targets**

**Rationale:**
Changing BCH350H1 numbering to the 400-level (BCH450H1) is to align it with the rest of the BCH electives (which are all 400-level courses). This minor change is to avoid student confusion and to better reflect the similarities in course content between this course and our other electives. It is unclear why it was ever given a 300-level designation as many of our other 400-level electives have similar pre-reqs.
9 Minor Program Modifications:

Animal Physiology Major

Completion Requirements:

(8 full courses or their equivalent)

First Year: BIO120H1, BIO130H1; (CHM135H1, CHM136H1)/(CHM138H1, CHM139H1)/CHM151Y1; JMB170Y1/(MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1/(PHY131H1, PHY132H1)/(PHY151H1, PHY152H1)

Higher Years:
1. + (BIO220H1, BIO230H1/BIO255H1)
2. BIO270H1, BIO271H1
3. CSB325H1
4. 0.5 FCE from: CJH332H1/CSB332H1, CSB343H1, CSB346H1
5. 1.5 FCEs (at least 0.5 FCE must be at the 300+ level) from: BCH210H1; BIO260H1/HMB265H1; CJH332H1; CSB299Y1, CSB327H1, CSB328H1, CSB329H1, CSB330H1, CSB331H1, CSB332H1, CSB343H1; CSB345H1, CSB346H1, CSB348H1, CSB352H1, CSB397Y0; CSB399Y1; EEB263H1; PSY397H1; STA220H1
6. 0.5 FCE at the 400-level from: CSB426H1, CSB427H1 CSB432H1, CSB434H1, CSB437H1, CSB438H1, CSB439H1, CSB443H1, CSB445H1, CSB447H1, CSB483H1, CSB492H1, CSB497H1, CSB498Y1, CSB499Y1; HMB430H1, HMB472H1, HMB496Y1, HMB499Y1; PSL432H1, PSL452H1

Description of Proposed Changes:

CSB332H1 is being removed as an option for CJH332H1. CSB345H1 and CSB443H1 are being retired, so need to be removed from the program. CSB328H1, CSB427H1, CSB430H1, CSB431H1 and CSB483H1 are being added to the program

Rationale:

CSB332H1 has not been listed in the Calendar since 2015-16 when it was changed to CJH332H1. CSB345H1 and CSB443H1 are no longer being offered due to a faculty retirement. The other courses are being added to provide students with a greater option of courses related to whole animal biology.

Impact:

We don't anticipate a negative impact because the removal of some courses is being offset by the addition of others. All of these courses are optional within the program.

Consultation:

Within the department. Changes were approved.

Resource Implications:

Cell & Molecular Biology Major: Focus in Molecular Networks of the Cell

Description:

Starting in 2nd year, this focus organizes a restricted number of highly motivated high-achieving Cell and Molecular Biology Major students with an interest in Molecular Networks of the Cell. Focus students are required to complete a subset of related program courses and to participate in a learning community for the focus.

Enrolment Requirements:
Once you have enrolled in the Cell and Molecular Biology Major program, you have the option to apply for entry into a focus. The focuses have a limited enrolment and can only accommodate a restricted number of students with a particular interest in the topic of the focus. **Students can only apply for one focus.** Admission will be determined with a minimum grade of 80% in BIO130H1. If the student does not achieve 80% in BIO130H1, admission can be determined with a minimum grade of 80% in BIO230H1, BIO255H1 or CSB349H1. On the application form in addition, students must include submit a 300-word statement of interest regarding the topic of the focus. Statement submission instructions are at http://csb.utoronto.ca/undergraduate-studies/undergraduate-programs/. Achieving these requirements does not necessarily guarantee admission to the focus in any given year.

Students in a focus complete the requirements of First Year, the requirements 1.-3. of Higher Years, as well as requirements 4.-7. specific to each focus.

Each year students are enrolled in a focus, they must also be an active participant in the faculty-led learning community for their focus(requirement 7.). The learning community appears as a non-credit course recognized on the co-curricular record. Students who fail to contribute to the faculty-led learning community will be removed from the focus.

**Description of Proposed Changes:**

Adding BIO255H1 to enrollment requirements

**Rationale:**

BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

**Impact:**

**Consultation:**

**Resource Implications:**

**Cell & Molecular Biology Major: Focus in Plant Genomics and Biotechnology**

**Description:**

Starting in 2nd year, this focus organizes a restricted number of highly motivated high-achieving Cell and Molecular Biology Major students with an interest in Plant Genomics and Biotechnology. Focus students are required to complete a subset of related program courses and to participate in a learning community for the focus.

**Enrolment Requirements:**

Once you have enrolled in the Cell and Molecular Biology Major program, you have the option to apply for entry into a focus. The focuses have a limited enrolment and can only accommodate a restricted number of students with a particular interest in the topic of the focus. **Students can only apply for one focus.** Admission will be determined with a minimum grade of 80% in BIO130H1. If the student does not achieve 80% in BIO130H1, admission can be determined with a minimum grade of 80% in BIO230H1, BIO255H1 or CSB349H1. On the application form in addition, students must include submit a 300-word statement of interest regarding the topic of the focus. Statement submission instructions are at http://csb.utoronto.ca/undergraduate-studies/undergraduate-programs/. Achieving these requirements does not necessarily guarantee admission to the focus in any given year.

Students in a focus complete the requirements of First Year, the requirements 1.-3. of Higher Years, as well as requirements 4.-7. specific to each focus.

Each year students are enrolled in a focus, they must also be an active participant in the faculty-led learning community for their focus(requirement 7.). The learning community appears as a non-credit course recognized on the co-curricular
**Description of Proposed Changes:**  
Adding BIO255H1 to enrollment requirements

**Rationale:**  
BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

**Impact:**

**Consultation:**

**Resource Implications:**

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**Cell & Molecular Biology Major: Focus in Stem Cells and Developmental Biology**

**Description:**

Starting in 2nd year, this focus organizes a restricted number of highly motivated high-achieving Cell and Molecular Biology Major students with an interest in Stem Cells and Developmental Biology. Focus students are required to complete a subset of related program courses and to participate in a learning community for the focus.

**Enrolment Requirements:**

Once you have enrolled in the Cell and Molecular Biology Major program, you have the option to apply for entry into a focus. The focuses have a limited enrolment and can only accommodate a restricted number of students with a particular interest in the topic of the focus. **Students can only apply for one focus.** Admission will be determined with a minimum grade of 80% in BIO130H1. If the student does not achieve 80% in BIO130H1, admission can be determined with a minimum grade of 80% in BIO230H1, BIO255H1 or CSB349H1. On the application form in addition, students must submit a 300-word statement of interest regarding the topic of the focus. Statement submission instructions are at http://csb.utoronto.ca/undergraduate-studies/undergraduate-programs/. Achieving these requirements does not necessarily guarantee admission to the focus in any given year.

Students in a focus complete the requirements of First Year, the requirements 1.-3. of Higher Years, as well as requirements 4.-7 specific to each focus.

Each year students are enrolled in a focus, they must also be an active participant in the faculty-led learning community for their focus(requirement 7.). The learning community appears as a non-credit course recognized on the co-curricular record. Students who fail to contribute to the faculty-led learning community will be removed from the focus.

**Description of Proposed Changes:**  
Adding BIO255H1 to enrollment requirements

**Rationale:**  
BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

**Impact:**

**Consultation:**
Resource Implications:

Cell & Molecular Biology Specialist

Enrolment Requirements:

This is a limited enrolment program that can only accommodate a limited number of students. Admission will be determined with a minimum grade of 70% in BIO130H1. If the student does not achieve 70% in BIO130H1, admission can be determined with a minimum grade of 70% in BIO230H1/BIO255H1. Achieving these marks does not necessarily guarantee admission to the program in any given year. Enrolment also requires the completion of four courses, including BIO120H1, BIO130H1; (CHM135H1, CHM136H1) / (CHM138H1, CHM139H1)/CHM151Y1; JMB170Y1/(MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1.

Description of Proposed Changes:
Adding BIO255H1 to enrollment requirements

Rationale:
BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

Impact:

Consultation:
None

Resource Implications:

Cell & Molecular Biology Specialist: Focus in Molecular Networks of the Cell

Description:

Starting in 2nd year, this focus organizes a restricted number of highly motivated high-achieving Cell and Molecular Biology Specialist students with an interest in Molecular Networks of the Cell. Focus students are required to complete a subset of related program courses and to participate in a learning community for the focus.

Enrolment Requirements:

Once you have been approved for and have enrolled in the Cell and Molecular Biology Specialist program, you have the option to apply for entry into a focus. The focuses have a limited enrolment and can only accommodate a restricted number of students with a particular interest in the topic of the focus. Students can only apply for one focus. Admission will be determined with a minimum grade of 80% in BIO130H1. If the student does not achieve 80% in BIO130H1, admission can be determined with a minimum grade of 80% in BIO230H1, BIO255H1 or CSB349H1. On the application form, students must include a 300-word statement of interest regarding the topic of the focus. Statement submission instructions are at http://csb.utoronto.ca/undergraduate-studies/undergraduate-programs/. Achieving these requirements does not necessarily guarantee admission to the focus in any given year.

Students in a focus complete the requirements of First Year, the requirements 1.-3. of Higher Years, as well as requirements 4.-7 specific to each focus.

Each year students are enrolled in a focus, they must also be an active participant in the faculty-led learning community for their focus (requirement 7.). The learning community appears as a non-credit course recognized on the co-curricular
Description of Proposed Changes:
Adding BIO255H1 to enrollment requirements

Rationale:
BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

Impact:

Consultation:
None

Resource Implications:

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Cell & Molecular Biology Specialist: Focus in Plant Genomics and Biotechnology

Description:
Starting in 2nd year, this focus organizes a restricted number of highly motivated high-achieving Cell and Molecular Biology Specialist students with an interest in Plant Genomics and Biotechnology. Focus students are required to complete a subset of related program courses and to participate in a learning community for the focus.

Enrolment Requirements:

Once you have been approved for and have enrolled in the Cell and Molecular Biology Specialist program, you have the option to apply for entry into a focus. The focuses have a limited enrolment and can only accommodate a restricted number of students with a particular interest in the topic of the focus. **Students can only apply for one focus.** Admission will be determined with a minimum grade of 80% in BIO130H1. If the student does not achieve 80% in BIO130H1, admission can be determined with a minimum grade of 80% in BIO230H1, BIO255H1 or CSB349H1. On the application form in addition, students must include submit a 300-word statement of interest regarding the topic of the focus. Statement submission instructions are at http://csb.utoronto.ca/undergraduate-studies/undergraduate-programs/. Achieving these requirements does not necessarily guarantee admission to the focus in any given year.

Students in a focus complete the requirements of First Year, the requirements 1.-3. of Higher Years, as well as requirements 4.-7 specific to each focus.

Each year students are enrolled in a focus, they must also be an active participant in the faculty-led learning community for their focus (requirement 7.). The learning community appears as a non-credit course recognized on the co-curricular record. Students who fail to contribute to the faculty-led learning community will be removed from the focus.

Description of Proposed Changes:
Adding BIO255H1 to enrollment requirements

Rationale:
BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

Impact:

Consultation:
None
Cell and Molecular Biology Specialist: Focus in Stem Cells and Developmental Biology

Description:

Starting in 2nd year, this focus organizes a restricted number of highly motivated high-achieving Cell and Molecular Biology Specialist students with an interest in Molecular Networks of the Cell. Focus students are required to complete a subset of related program courses and to participate in a learning community for the focus.

Enrolment Requirements:

Once you have been approved for and have enrolled in the Cell and Molecular Biology Specialist program, you have the option to apply for entry into a focus. The focuses have a limited enrolment and can only accommodate a restricted number of students with a particular interest in the topic of the focus. Students can only apply for one focus. Admission will be determined with a minimum grade of 80% in BIO130H1. If the student does not achieve 80% in BIO130H1, admission can be determined with a minimum grade of 80% in BIO230H1, BIO255H1 or CSB349H1. On the application form in addition, students must include submit a 300-word statement of interest regarding the topic of the focus. Statement submission instructions are at http://csb.utoronto.ca/undergraduate-studies/undergraduate-programs/. Achieving these requirements does not necessarily guarantee admission to the focus in any given year.

Students in a focus complete the requirements of First Year, the requirements 1.-3. of Higher Years, as well as requirements 4.-7 specific to each focus.

Each year students are enrolled in a focus, they must also be an active participant in the faculty-led learning community for their focus(requirement 7.). The learning community appears as a non-credit course recognized on the co-curricular record. Students who fail to contribute to the faculty-led learning community will be removed from the focus.

Description of Proposed Changes:

Adding BIO255H1 to enrollment requirements

Rationale:

BIO255H1 is an advanced version of BIO230H1 and needs to be included as an option for students

Impact:

Consultation:

None

Resource Implications:

Genome Biology Major

Completion Requirements:

This program is a joint program of the departments of Cell & Systems Biology, Ecology & Evolutionary Biology, and Molecular Genetics. It is administered through the Department of Cell & Systems Biology.

(8 full courses or their equivalent)
Cell and Systems Biology (FAS), Department of

First year: BIO120H1, BIO130H1; (CHM135H1, CHM136H1)/(CHM138H1, CHM139H1)/CHM151Y1; (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1

Higher years:
1. BIO220H1, BIO230H1/BIO255H1; BIO260H1/HMB265H1; EEB225H1/STA220H1
2. Genomics fundamentals: BCH311H1/CSB349H1/MGY311Y1, CSB352H1; EEB323H1
3. 0.5 FCE laboratory course from: CSB472H1, CSB474H1; EEB460H1
4. 1.0 FCE genomics elective from: CSB330H1, CSB350H1, CSB397Y0, CSB427H1, CSB435H1, CSB450H1, CSB457H1, CSB458H1, CSB471H1, CSB473H1, CSB490H1, CSB491H1, CSB497H1/CSB498Y1/CSB499Y1; EEB362H1, EEB455H1, EEB459H1, EEB462H1, EEB397Y1/EEB497H1/EEB498Y1/EEB499Y1; EHB352H1; MGY350H1, MGY360H1, MGY428H1, MGY470H1, MGY480Y1

NOTE: Students taking CSB397Y0, CSB490H1, CSB491H1, CSB497H1/CSB498Y1/CSB499Y1, EEB397Y1/EEB497H1/EEB498Y1/EEB499Y1 or MGY480Y1 are encouraged to conduct a genomics-related research project.

**Description of Proposed Changes:**
Adding EEB397Y1Y to list of options.

**Rationale:**
Adding EEB397Y1Y provides students with an additional option for an independent research course in the program.

**Impact:**

**Consultation:**
None

**Resource Implications:**

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**2 Retired Courses:**

**CSB345H1: Introductory Biology of Sleep**

**Rationale:**
Instructor of course retiring. No resources to continue this course. This course was not required in the Animal Physiology Major program, so we do not feel that its removal will have a negative impact on students completing the program.

**Consultation:**
Within the department. Retiring of course approved.

**CSB443H1: Homeostasis**

**Rationale:**
The instructor of the course is retiring. Resources are not available to continue the teaching of this course. This course was not required in the Animal Physiology Major program, so we do not feel its removal will have a negative impact on the students.

**Consultation:**
Within the department. Retirement of this course was approved.
# 2 Course Modifications:

## CHM395Y1: Research Project in Chemistry

**Impact on Programs:**
This proposal triggers modifications in the unit's program(s)

**Description:**
An independent independent research project conducted under the direction of a teaching faculty or research faculty member in the Department of Chemistry. Applications for enrolment should be made to the Department before the end of the preceding Summer session. Not eligible for CR/NCR option.

**Prerequisites:**
- **Minimum GPA of 3.3 in CHM courses**
- Completion of at least 2.5 FCEs of CHM courses with a minimum cGPA. Permission of 3.3 in all CHM courses. Students are required to identify a potential faculty supervisor before contacting the Associate Chair, Undergraduate Studies for enrolment permission. Written confirmation is needed from both the Associate Chair, Undergraduate Studies and of the prospective supervisor. Attendance at a mandatory safety orientation training session held during the first week of September.

**Rationale:**

**Consultation:**

**Resources:**

## CHM499Y1: Introduction to Chemistry Research

**Contact Hours:**
- Previous: **Practical:** 240
- New: **Practical:** 240 / **Seminar:** 16

**Description:**
An experimental or theoretical research problem under the supervision of a teaching faculty or research faculty member in the Department of Chemistry. Five mandatory 90-minute professional development workshops cover aspects of academic writing, poster presentations, reading scientific literature, and job applications/interviews. Each student is required to attend a total of six one-hour research colloquia during the Fall and Winter Sessions. Applications for enrolment should be made to the Department in the preceding Winter Session with the deadline being the Friday before Reading Week: the application: Application form is available at the Department of Chemistry website [http://www.chem.utoronto.ca/~undergrad/Application_Form.pdf](http://www.chem.utoronto.ca/~undergrad/Application_Form.pdf). Students are notified with the results of their application by the last week of March. Only students being admitted offered admission are required to contact chemistry faculty to discuss for available research projects and supervision. Projects are in the areas of environmental, analytical, physical, inorganic, materials, polymer, organic and biological chemistry. Not eligible for CR/NCR option.

**Prerequisites:**
- Permission of the department. Minimum CGPA of 3.0. Research positions are limited. Students with strong background on courses in the sub-discipline of research interest will be given preference. Attendance at a mandatory safety orientation training session held during the first week of September. preference.
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<td>CHM489Y5, CHMD90Y3, MSE498Y1, <strong>PHC489Y1</strong></td>
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4 Minor Program Modifications:

Focus in Artificial Intelligence

Completion Requirements:

Required Courses:

1. 1.0 FCE from the following: CSC336H1, MAT235Y1/MAT237Y1/MAT257Y1, APM236H1, MAT224H1/MAT247H1, STA248H1/STA261H1, STA302H1, STA347H1
2. 2.5 FCEs from the following, so that courses are from at least two of the four areas:
   a. CSC401H1, CSC485H1
   b. CSC320H1, CSC420H1
   c. CSC413H1/CSC421H1/CSC321H1, CSC311H1/CSC411H1, CSC412H1/STA414H1
   d. CSC304H1, CSC384H1, CSC486H1

Suggested Related Courses:

CSC324H1, COG250Y1, PSY270H1, PHL232H1, PHL342H1

Description of Proposed Changes:

Added STA414H1 to required courses 2c.

Rationale:

Impact:

Consultation:

Discussed and approved by CS UGC October 2019.

Resource Implications:

Focus in Computer Vision

Completion Requirements:

Required Courses:

1. MAT235Y1/MAT237Y1/MAT257Y1, CSC320H1, CSC336H1, CSC311H1/CSC411H1, CSC420H1
2. 0.5 FCE from the following: CSC412H1, CSC417H1, CSC317H1/CSC418H1, CSC419H1, CSC2503H (Note: students must petition to take a graduate course.)

Suggested Related Courses:

The following are examples of topics and courses that fit naturally with a study of computational vision. The list is meant
Description of Proposed Changes:
   Added CSC317H1 and CSC417H1 to the focus requirements.

Rationale:

Impact:

Consultation:
   Approval granted by focus sponsor(s) and CS UGC September 2019.

Resource Implications:

Focus in Game Design

Completion Requirements:

Required courses:

1. CSC300H1, CSC301H1, CSC318H1, CSC384H1, CSC317H1/CSC417H1/CSC418H1/CSC419H1, CSC404H1

Suggested Related Courses:

1. CSC303H1, CSC304H1, CSC358H1, CSC458H1, CSC428H1
2. MUS300H1, CIN212H1/INI222H1, CIN432H1/INI465H1, ENG235H1
3. ECO326H1, RSM482H1/MGT2056H

Description of Proposed Changes:
   Added CSC317H1, CSC417H1 and CSC419H1 to the focus requirements.

Rationale:

Impact:

Consultation:
   Approval granted by the focus sponsor(s) and CS UGC September 2019.

Resource Implications:

Focus in Scientific Computing

Completion Requirements:
Computer Science (FAS), Department of

Required Courses:

1. MAT235Y1/MAT237Y1/MAT257Y1,
2. 1.5 FCEs from the following: CSC336H1, CSC436H1, CSC446H1, CSC456H1, CSC466H1
3. 1.0 FCE from the following: CSC317H1/CSC320H1/CSC417H1/CSC418H1/CSC419H1, CSC311H1/CSC411H1, CSC343H1, CSC384H1, CSC358H1/CSC458H1

Suggested Related Courses:

- CSC367H1
- MAT224H1/MAT240H1/MAT247H1, MAT334H1/MAT354H1, MAT337H1/MAT357H1

It is also recommended that students in this focus consider taking a half-course or two from the basic sciences (such as physics, chemistry, biology), as these sciences are the source of many problems solved by numerical techniques.

Description of Proposed Changes:
    Added CSC317H1 and CSC417H1 to the focus requirements.

Rationale:

Impact:

Consultation:
    Approval granted by the focus sponsor(s) and CS UGC September 2019.

Resource Implications:

2 New Courses:

CSC317H1: Computer Graphics

Impact on Programs:
    This proposal triggers modifications in the unit's program(s)

Contact Hours:
    Lecture: 24 / Tutorial: 12

Description:
    Identification and characterization of the objects manipulated in computer graphics, the operations possible on these objects, efficient algorithms to perform these operations, and interfaces to transform one type of object to another. Display devices, display data structures and procedures, graphical input, object modelling, transformations, illumination models, primary and secondary light effects; graphics packages and systems. Students, individually or in teams, implement graphical algorithms or entire graphics systems.

Prerequisites:
    CSC209H1/proficiency in C or C++, MAT235Y1/MAT237Y1/MAT257Y1, MAT221H1/MAT223H1/MAT240H1.
    Prerequisite for Engineering students only: ECE345H1 or ECE352H1

Corequisites:
Exclusions:
CSC418H1. NOTE: Students not enrolled in the Computer Science Major or Specialist program at FAS, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Recommended Preparation:
MAT244H1

Breadth Requirements:
The Physical and Mathematical Universes (5)

Distribution Requirements:
Science

Competencies:
Communication: none; Critical and Creative Thinking: none; Information Literacy: none
Quantitative Reasoning: none; Social and Ethical Responsibility: none

Experiential Learning:
Research: none; Other: none

Rationale:
We're re-numbering CSC418H1 to CSC317H1.

Consultation:
Discussed and approved by CS UGC September 2019.

Resources:
Budget Implications: The academic unit will provide the resources required for this course from existing budget.

Overlap with Existing Courses:

Programs of Study for Which This Course Might be Suitable:

Estimated Enrolment:

Instructor:

CSC417H1: Physics-Based Animation

Contact Hours:
Lecture: 24 / Tutorial: 12

Description:
This course is designed to introduce students to the field of physics-based animation by exposing them to the underlying mathematical and algorithmic techniques required to understand and develop efficient numerical simulations of physical phenomena such as rigid bodies, deformable bodies and fluids. Topics covered include rigid body simulation, elasticity simulation, cloth simulation, collision detection and resolution and fluid simulation. Along the way, we will explore the underlying mathematics of ordinary differential equations, discrete time integration, finite element methods and more.

Students should have a strong background in Linear Algebra and Multivariate Calculus.
### Computer Science (FAS), Department of

#### Prerequisites:
- MAT235Y1 /MAT237Y1/ MAT257Y1/ MAT291H1/ MAT294H1; MAT221H1/ MAT223H1/ MAT240H1/ MAT185H1/ MAT188H1; CSC209H1/ proficiency in C or C++/ APS105H1/ ESC180H1/ CSC180H1;

#### Corequisites:
- None

#### Exclusions:
- NOTE: Students not enrolled in the Computer Science Major or Specialist program at FAS, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

#### Recommended Preparation:
- None

#### Breadth Requirements:
- The Physical and Mathematical Universes (5)

#### Distribution Requirements:
- Science

#### Competencies:
- **Communication**: notably; **Critical and Creative Thinking**: extensively; **Information Literacy**: notably
- **Quantitative Reasoning**: extensively; **Social and Ethical Responsibility**: none

#### Experiential Learning:
- **Research**: notably; **Other**: none

#### Rationale:
This course provides an introduction to physics-based animation. Primarily, techniques for physics-based animation are used for both computer graphics research and in the graphics industry. This course will be essential to students who wish to pursue either of these career paths. However, techniques from physics-based animation are widely applicable to any area wherein physical simulation of the environment is required. This includes, but is not limited to, mechanical and civil engineering, machine learning, astronomy, biomechanics, and medical imaging.

Physics-based animation is considered one of the core areas of computer graphics. Quantitatively, research in this area accounts for approximately 30% of the publications in computer graphics and many more works rely on techniques from the field. As mentioned above, physics-based animation also encapsulates a core set of mathematical and technical skills that are widely used in the video game, visual effects and engineering industries. Given the central importance of this field of work, it’s disappointing that our current suite of undergraduate graphics offerings does not cover physics-based animation in any way. This is in contrast to other major graphics programs at top universities such as Columbia, Stanford and Cornell which all offer specific courses on physics-based animation.

The addition of Physics-based animation to our undergraduate course offerings will serve to bring our undergraduate computer graphics program in line with other major universities. It will also enrich the undergraduate student experience by (for the first time at UofT) providing them the opportunity to experience this exciting field of work.

#### Consultation:
This course does not affect other programs.

#### Resources:
- Projector, white board

#### Budget Implications:
- The academic unit will provide the resources required for this course from existing budget.

#### Overlap with Existing Courses:
There is no current computer science course that offers a comprehensive introduction to computational simulation of complex physical phenomena. Some of the introductory matter in this course will overlap with that of CSC418 (which itself does not cover physics-based animation in any way). CSC419 (geometry processing) explores a completely distinct area of study.

#### Programs of Study for Which This Course Might be Suitable:
Computer Science (FAS), Department of Computer Science, Mechanical Engineering, Data Science, Physics

Estimated Enrolment: 60

Instructor: David I.W. Levin

13 Course Modifications:

CSC263H1: Data Structures and Analysis

Prerequisites:
- CSC236H1/CSC240H1 /APS105H1/APS106H1/ESC180H1; STA237H1/CSC240H1; STA247H1/STA255H1/STA257H1 /ECE302H1/STA286H1/CHE223H1/CME263H1/MIE231H1/MIE236H1/MSE238H1/ECE286H1/STA257H1

Rationale:
- Added engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer.
- Removed CSC207H1 as a prerequisite. In recent years, CSC263H1 has not required students to do any programming. Supported by S. Toeug and F. Pitt.

Consultation:
- Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff.

Supported Discussed and approved by CS UGC September 2019.

Resources:

CSC309H1: Programming on the Web

Prerequisites:
- CSC209H1/ESC180H1/ESC190H1/CSC190H1/(APS105H1, ECE244H1)

Exclusions:
- NOTE: Students not enrolled in the Computer Science Major or Specialist program at FAS the UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Rationale:
- We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. In addition, there's an update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Consultation:
- Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff.

Re: update to the exclusions language: Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR.

Resources:
CSC311H1: Introduction to Machine Learning

**Prerequisites:**
CSC207H1/APS105H1/APS106H1/ESC180H1/CSC180H1; MAT235Y1/ MAT237Y1/ MAT257Y1/ (minimum of 77% in MAT135H1 and MAT136H1)/(minimum of 73% in MAT137Y1)/(minimum of 67% in MAT157Y1)/MAT291H1/MAT294H1/(minimum of 77% in MAT186H1, MAT187H1)/(minimum of 73% in MAT194H1, MAT195H1)/(minimum of 73% in ESC194H1, ESC195H1); MAT221H1/ MAT223H1/MAT240H1/MAT185H1/MAT188H1; STA237H1/ STA247H1/STA255H1/STA257H1/STA286H1/CHE223H1/CME263H1/MIE231H1/MIE236H1/MSE238H1/ECE286H1

**Exclusions:**
CSC411H1, STA314H1, ECE421H1. NOTE: Students not enrolled in the Computer Science Major or Specialist program at FAS the UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

**Rationale:**
We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. In addition, there's an update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

**Consultation:**
Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff.

Re: update to the exclusions language: Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR.

**Resources:**

CSC318H1: The Design of Interactive Computational Media

**Prerequisites:**
Any CSC half-course/ESC180H1/ESC190H1/APS105H1/APS106H1

**Exclusions:**
NOTE: Students not enrolled in the Computer Science Major or Specialist program at FAS the UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

**Rationale:**
We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. In addition, there's an update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

**Consultation:**
Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff.

Re: update to exclusions language: Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR.

**Resources:**

CSC384H1: Introduction to Artificial Intelligence

**Prerequisites:**
(CSC263H1/ CSC265H1/ECE345H1/ECE358H1/MIE335H1, STA237H1/STA247H1/ STA255H1/ STA257H1/ECE302H1/STA286H1/CHE223H1/CME263H1/MIE231H1/MIE236H1/MSE238H1/ECE286H1)/ Permission of the
Cognitive Science Director

Exclusions:

NOTE: Students not enrolled in the Computer Science Major or Specialist program at FAS the UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Rationale:

We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. In addition, we're updating the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Consultation:

Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff.

Re: update to exclusions language: Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR.

Resources:

CSC401H1: Natural Language Computing

Prerequisites:

CSC207H1/CSC209H1/APS105H1/APS106H1/ESC180H1/CSC180H1; STA237H1/CSC209H1; STA247H1/STA255H1/STA257H1 /ECE302H1/STA286H1/CHE223H1/CME236H1/MIE231H1/MIE236H1/MSE238H1/ ECE286H1 STA257H1

Exclusions:

NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Rationale:

We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Consultation:

Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR.

Resources:

CSC404H1: Introduction to Video Game Design

Prerequisites:

CSC301H1/CSC317H1/CSC318H1/CSC384H1/CSC417H1/CSC418H1/CSC419H1

Exclusions:

NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Rationale:

Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Consultation:
Computer Science (FAS), Department of

Discussed and approved by CS UGC September 2019 (additional prerequisite options). Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

Resources:

### CSC412H1: Probabilistic Learning and Reasoning

**Prerequisites:**

CSC412H1/CSC311H1/CSC411H1/STA314H1/ECE421H1/ROB313H1/CSCC11H3

**Exclusions:**

STA414H1. NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

**Rationale:**

We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer.

- Added STA414H1 as exclusion.

- Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

**Consultation:**

Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

**Resources:**

### CSC413H1: Neural Networks and Deep Learning

**Prerequisites:**

CSC311H1/ CSC411H1 CSC412H1/STA314H1/ECE421H1/ROB313H1/CSCC11H3;; MAT235Y1/ MAT237Y1/ MAT257Y1/MAT291H1/MAT294H1/AER210H1/MAT232H5/MAT233H5/MATB41H5;; MAT221H1/MAT223H1/ MAT240H1/MAT185H1/MAT188H1/MAT223H5/MATA23H3

**Exclusions:**

CSC321H1/CSC421H1. NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

**Rationale:**

We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer.

- Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

**Consultation:**

Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

**Resources:**
CSC419H1: Geometry Processing

Exclusions:
NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UT, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Recommended Preparation:
CSC317H1/CSC418H1

Rationale:
We are adding CSC317H1 course as recommended preparation. Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Consultation:
Discussed and approved by CS UGC September 2019. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

Resources:

CSC420H1: Introduction to Image Understanding

Prerequisites:
CSC263H1/CSC265H1/ECE345H1/ECE358H1/MIE335H1; (MAT135H1, MAT136H1)/MAT135Y1/MAT137Y1/MAT157Y1/(MAT186H1, MAT187H1)/(MAT194H1, MAT195H1)/(ESC194H1, ESC195H1); MAT221H1/MAT223H1/MAT240H1/MAT185H1/MAT188H1

Exclusions:
NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UT, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Rationale:
We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Consultation:
Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

Resources:

CSC428H1: Human-Computer Interaction

Prerequisites:
CSC318H1; STA237H1/STA247H1/STA255H1/STA255H1/STA257H1/ECE302H1/STA286H1/CHE223H1/CME263H1/MIE231H1/MIE236H1/MSE238H1/ECE286H1; STA257H1/CSC209H1; proficiency in C or C++ or Java/APS105H1/ESC180H1/CSC180H1

Exclusions:
NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UT, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

Rationale:
We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

Resources:
## Consultation:
Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

### Resources:

## CSC485H1: Computational Linguistics

### Prerequisites:
- CSC209H1/APS105H1/APS106H1/ESC180H1/CSC180H1; STA237H1/STA247H1/ STA255H1/STA257H1 / ECE302H1/STA286H1/CHE223H1/CME263H1/MIE231H1/MIE236H1/MSE238H1/ECE286H1 STA257H1; CSC209H1

### Exclusions:
- NOTE: Students not enrolled in the Computer Science Major or Specialist program at the FAS UTSG, UTM, or UTSC, or the Data Science Specialist at FAS, are limited to a maximum of three 300-/400-level CSC/ECE half-courses.

### Rationale:
We are adding engineering course prerequisites to all our CSC courses regularly taken by FASE students. This does not change our courses in any way, just allows prerequisites to be checked automatically through Degree Explorer. Update to the exclusions language to reflect the fact that the Data Science Specialist is one of the Specialist programs offered by the Department of Computer Science.

### Consultation:
Discussed in the IDT meeting and also with Tamara Jones, Jason Foster, Sharon Brown, Cheryl O'Donoghue and the CSC undergrad office staff. Consultation between the Department of Computer Science and the Enrolment and Records team at Arts & Science OFR (exclusions).

### Resources:

## 4 Retired Courses:

### CSC121H1: Computer Science for Statistics

### Rationale:
The course is no longer being offered.

### Consultation:
Approved by Statistics and CS UGC September 2019.

### CSC204H1: Collaborating with Computer Scientists

### Rationale:
The course was introduced to give non-CS students a credit when participating in a DCSIL summer entrepreneurship program. Course is no longer being offered and be removed.

### Consultation:
Discussed and approved by CS UGC September 2019.

### CSC418H1: Computer Graphics

### Rationale:
As a result of changing CSC418H1 to CSC317H1, we are retiring CSC418H1.

### Consultation:
Discussed and approved by CS UGC September 2019.
ECE489H1: Compilers II

Rationale:

Cross-listed course with ECE540, which has been discontinued.
8 Minor Program Modifications:

Biodiversity and Conservation Biology Major

Completion Requirements:

(8 FCEs including at least 2.0 FCEs at 300+ series with at least 0.5 FCE at the 400 level series)

First Year (1.0 FCE): BIO120H1; MAT135H1/MAT137Y1/MAT221H1/MAT223H1

Higher Years:

1. 2.0 FCEs: BIO220H1 (ecology and evolutionary biology); EEB225H1 (recommended)/STA220H1/STA257H1/ STA288H1/GGR270H1/PSY201H1 (statistics); EEB255H1 (conservation biology); ENV234H1 (environmental biology; cannot be substituted with EEB375H1)

2. 1.5 FCEs in organismal biology (with at least 0.5 FCE from Group 1 and 0.5 FCE from Group 2) from:
   - Group 1 (plant or microbial): BIO251H1; EEB268H1; EEB330H1, EEB331H1, EEB340H1; FOR305H1
   - Group 2 (animal): EEB263H1, EEB266H1, EEB267H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1

3. 0.5 FCE in core evolution: EEB318H1, EEB323H1, EEB362H1

4. 0.5 FCE in core ecology from: EEB319H1, EEB320H1, EEB321H1, EEB328H1

5. 0.5 FCE: EEB365H1 (applied conservation biology)

6. 1.5 FCEs from: BIO130H1, BIO251H1; EEB263H1, EEB266H1, EEB267H1, EEB268H1, EEB313H1, EEB318H1, EEB319H1, EEB320H1, EEB321H1, EEB322H1, EEB323H1, EEB324H1, EEB325H1, EEB328H1; EEB330H1, EEB331H1, EEB340H1, EEB362H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1, EEB390H1, EEB397Y1, EEB398H0, EEB399Y0, EEB428H1, EEB430H1, EEB433H1, EEB440H1, EEB455H1, EEB459H1, EEB491H1, EEB495H1, EEB497H1, EEB498Y1, EEB499Y1; EHJ352H1; ENV334H1, ENV432H1; FOR200H1, FOR201H1, FOR307H1, FOR413H1; GGR272H1, JHE353H1, JHE355H1; NUS

7. 0.5 FCE at 400 series from: EEB465H1, EEB466H1; field course: EEB403H0, EEB403H1, EEB405H0, EEB405H1, EEB406H0, EEB406H1, EEB407H0, EEB407H1, EEB410H0, EEB410H1; seminar: EEB491H1, EEB495H1, EEB495H1; EEB497H1; research project: EEB498Y1 (recommended research subject in biodiversity and/or conservation biology) and concurrent research issues course EEB488H1 (0.5 FCE)

NOTE: BIO260H1/HMB265H1 (genetics) is recommended. Note that both BIO260H1 and HMB265H1 require BIO130H1 and BIO230H1; BIO230H1 requires both CHM135H1 and CHM136H1

Students interested in law, economics, policy, or environmental studies may choose to pair their Biodiversity and Conservation Biology Major with another Major such as Economics, Environmental Ethics, or Environmental Studies (all three are Arts programs), or Science programs (e.g., School of the Environment programs).

Description of Proposed Changes:

Rationale:

Removing retired courses and adding new courses.

Impact:
Ecology and Evolutionary Biology (FAS), Department of

Consultation:
Internal departmental committee

Resource Implications:

Biology Major

Completion Requirements:

The Biology Specialist, Major, and Minor programs are administered through the Department of Ecology & Evolutionary Biology. Contact: undergrad.eeb@utoronto.ca

(8 FCEs including at least 1.5 FCEs at the 300+ series and 0.5 FCE at the 400 series)

First Year (2.0 FCEs): BIO120H1; BIO130H1; (CHM135H1, CHM136H1)/CHM151Y1

Higher Years:
1. 2.5 FCEs: BIO220H1; BIO230H1/BIO255H1; BIO251H1; BIO270H1/PSC300H1; BIO260H1/HMB265H1

2. 1.5 FCE from: BCH; BIO; CJH332H1; CSB (excluding CSB196H1, CSB197H1, CSB198H1, CSB199H1, CSB200Y1, CSB201H1, CSB202H1); EEB (excluding EEB197H1, EEB198H1, EEB199H1, EEB202H1, EEB208H1, EEB214H1, EEB215H1); EHI352H1; ENV234H1, ENV334H1; IMM250H1; JHE353H1, JHE355H1; MGY200H1, MGY277H1; NFS284H1; PSY397H1, PSY497H1

3. 1.5 FCE at 300+ series from: ANA; ANT333Y1, ANT338H1, ANT430H1, ANT436H1; BCH; CJH332H1; CSB; EEB; EHI352H1; ENV334H1, ENV432H1; HMB; IMM; JHE353H1, JHE355H1; MGY; NUS; PCL; PSL; PSY397H1, PSY497H1

4. 0.5 FCE at 400-series from: CSB; EEB; ENV432H1

NOTE: Students who wish to focus on either plant or microbial biology, or animal biology should take courses in 2., 3., and 4. that concentrate in these subject areas (as listed below).

CSB and EEB courses in plant or microbial biology: CSB340H1, CSB350H1, CSB351Y1, CSB353H1, CSB450H1, CSB452H1, CSB454H1, CSB459H1, CSB460H1, CSB475H1; EEB268H1, EEB328H1, EEB330H1, EEB331H1, EEB340H1, EEB405H0, EEB405H1, EEB428H1, EEB440H1

CSB and EEB courses in animal biology: BIO271H1/PSL301H1; CJH332H1; CSB325H1, CSB327H1, CSB328H1, CSB329H1, CSB330H1, CSB331H1, CSB343H1; CSB345H1, CSB346H1, CSB348H1, CSB426H1, CSB427H1, CSB428H1, CSB429H1, CSB430H1, CSB431H1, CSB432H1, CSB435H1, CSB445H1, CSB447H1, CSB483H1; EEB263H1, EEB266H1, EEB267H1, EEB322H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1, EEB390H1, EEB440H1; EHI352H1. (BIO271H1/PSL301H1 is highly recommended for students concentrating in animal biology and is a prerequisite for 300+ series CSB courses in physiology.)

Description of Proposed Changes:
Inclusion of FYF courses in the exclusions: EEB197H1, 198H1, 199H1 and CSB196H1, 197H1, 198H1, 199H1.
Retiring CSB200Y1 and CSB345H1.

Rationale:

Impact:

Consultation:
**Ecology and Evolutionary Biology (FAS), Department of**

Internal departmental committees, and communication between the Department of Ecology & Evolutionary Biology and the Department of Cell & Systems Biology.

<table>
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<tr>
<th>Resource Implications:</th>
</tr>
</thead>
</table>

**Biology Minor**

**Completion Requirements:**

The Biology Specialist, Major, and Minor programs are administered through the Department of Ecology & Evolutionary Biology. Contact: undergrad.eeb@utoronto.ca

<table>
<thead>
<tr>
<th>4 FCEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year (1.0 FCE): BIO120H1; BIO130H1</td>
</tr>
<tr>
<td>Higher Years:</td>
</tr>
<tr>
<td>1. 1.0 FCE from: BIO220H1; BIO230H1/BIO255H1; BIO251H1; BIO270H1/PSL300H1; BIO271H1/PSL301H1; BIO260H1/HMB265H1</td>
</tr>
<tr>
<td>2. 2.0 FCEs (1.0 FCE must be at the 300+ series) from: BIO; CJH332H1; CSB (excluding CSB196H1, CSB197H1, CSB198H1, CSB199H1, CSB200Y1, CSB201H1, CSB202H1); EEB (excluding EEB197H1, EEB198H1, EEB199H1, EEB202H1, EEB208H1, EEB214H1, EEB215H1); EHJ352H1; ENV234H1, ENV334H1, ENV432H1; HMB265H1; JHE353H1, JHE355H1; MGY200H1, MGY277H1; NUS; PSY397H1, PSY497H1</td>
</tr>
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</table>

**Description of Proposed Changes:**

Inclusion of FYF courses EEB197H1, 198H1, 199H1 and CSB196H1, 197H1, 198H1, 199H1 in list of exclusions. CSB200Y1 is now retired.

**Rationale:**

**Impact:**

**Consultation:**

Internal departmental committees.

**Resource Implications:**

**Biology Specialist**

**Completion Requirements:**

The Biology Specialist, Major, and Minor programs are administered through the Department of Ecology & Evolutionary Biology. Contact: undergrad.eeb@utoronto.ca

<table>
<thead>
<tr>
<th>(12 FCEs including at least 1.0 FCE at the 400 series)</th>
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<tbody>
<tr>
<td>First Year (3.0 FCEs): BIO120H1; BIO130H1; (CHM135H1, CHM136H1)/CHM151Y1; (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1</td>
</tr>
<tr>
<td>Higher Years:</td>
</tr>
</tbody>
</table>

27
Ecology and Evolutionary Biology (FAS), Department of

1. 2.5 FCEs: BIO220H1; BIO230H1/BIO255H1; BIO251H1; BIO270H1/PSL300H1; BIO260H1/HMB265H1

2. 0.5 FCE statistics from: EEB225H1, PSY201H1, STA220H1, STA257H1, GGR270H1, STA288H1

3. 0.5 FCE from chemistry, physics or statistics: CHM220H1, CHM247H1/CHM249H1; PHY131H1, PHY151H1; PSY202H1; STA221H1, STA255H1, STA261H1

4. 1.5 FCE at the 200+ series from: BCH; BIO; CJH332H1; CSB (excluding CSB200Y1, CSB201H1, CSB202H1); EEB (excluding EEB202H1, EEB208H1, EEB214H1, EEB215H1); EJJ352H1; ENV234H1, ENV334H1; ENV432H1; IMM250H1; JHE353H1, JHE355H1; MGY200H1, MGY277H1; NFS284H1; PSY397H1, PSY497H1

5. 0.5 FCE at 300+ series in **plant or microbial biology** from: CSB340H1, CSB350H1, CSB351Y1, CSB353H1, CSB450H1, CSB452H1, CSB454H1, CSB459H1, CSB460H1, CSB475H1; EEB328H1; EEB330H1; EEB331H1, EEB340H1, EEB403H1, EEB405H0, EEB405H1, EEB428H1, EEB440H1

6. 0.5 FCE at 300+ series in **animal biology** from: CJH332H1; CSB325H1, CSB327H1, CSB328H1, CSB329H1, CSB330H1, CSB331H1, CSB332H1, CSB343H1; CSB345H1; CSB346H1, CSB348H1, CSB426H1, CSB427H1, CSB428H1, CSB429H1, CSB430H1, CSB431H1, CSB432H1, CSB435H1, CSB445H1, CSB447H1, CSB483H1; EEB322H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1, EEB390H1, EEB440H1; EJJ352H1

NOTE: BIO270H1 and BIO271H1 are prerequisites for 300+ series CSB courses in physiology.

7. 2.0 FCEs at 300+ series (at least 1.0 FCE must be from Group 1) from: Group 1: CJH332H1; CSB; EEB; EJJ352H1; ENV334H1, ENV432H1; JHE353H1, JHE355H1; NUS; PSY397H1, PSY497H1 Group 2: ANA; ANT333Y1, ANT338H1, ANT430H1, ANT436H1; BCH; HMB; IMM; NFS; MGY; PCL; PSL

8. 1.0 FCE at 400-series from: CSB; EEB

NOTE: Students who wish to focus on either **plant or microbial biology**, or **animal biology** should take courses in 7. and 8. that concentrate in these subject areas as listed in 5. and 6., respectively. BIO271H1/PSL301H1 is highly recommended for students concentrating in animal biology and is a prerequisite for 300+ series CSB courses in physiology.

**Description of Proposed Changes:**

Retired courses EEB330H1, CSB345H1 and CSB200Y1 removed.

**Rationale:**

**Impact:**

**Consultation:**

Internal departmental committees, and communication between the Department of Ecology & Evolutionary Biology and the Department of Cell & Systems Biology.

**Resource Implications:**

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**Ecology & Evolutionary Biology Major**

**Completion Requirements:**

(8 FCEs including at least 2.0 FCEs at 300+ series with at least 0.5 FCE at the 400 series level)

First Year (2.0 FCEs): BIO120H1; BIO130H1; (CHM135H1, CHM136H1)/CHM151Y1
Ecology and Evolutionary Biology (FAS), Department of

Higher Years:

1. 2.0 FCEs: BIO220H1; BIO230H1; BIO260H1/HMB265H1; EEB225H1/STA220H1/STA257H1/STA288H1/GGR270H1/PSY201H1
2. 1.0 FCE from: BIO251H1, BIO270H1/PSL300H1, BIO271H1/PSL301H1, EEB263H1, EEB266H1, EEB267H1, EEB268H1, ENV234H1
3. 0.5 FCE in core ecology and evolution from: EEB318H1, EEB319H1, EEB320H1, EEB321H1, EEB322H1, EEB328H1, EEB362H1

4. 1.5 FCEs from: EEB313H1, EEB318H1, EEB319H1, EEB320H1, EEB321H1, EEB322H1, EEB323H1, EEB324H1, EEB325H1, EEB328H1; EEB330H1, EEB331H1, EEB362H1, EEB365H1, EEB375H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1, EEB390H1, EEB397Y1, EEB398H0, EEB398Y0, EEB399Y1, EEB428H1, EEB430H1, EEB433H1, EEB440H1, EEB455H1, EEB459H1, EEB460H1, EEB465H1, EEB466H1; EEB328H1; ENV432H1; NUS201H0, NUS301H0, NUS302H0, NUS303H0, NUS304H0, NUS401H0; PSY305H1

5. 0.5 FCE from: BIO251H1; BIO270H1/PSL300H1; BIO271H1/PSL301H1; EEB (excluding EEB197H1, EEB198H1, EEB199H1, EEB202H1, EEB208H1, EEB214H1, EEB215H1); ENV234H1, ENV334H1, ENV432H1; EEB328H1; EEB330H1, EEB331H1, EEB362H1, EEB365H1, EEB375H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1, EEB390H1, EEB397Y1, EEB398H0, EEB398Y0, EEB399Y1, EEB428H1, EEB430H1, EEB433H1, EEB440H1, EEB455H1, EEB459H1, EEB460H1, EEB465H1, EEB466H1; EEB488H1; ENV432H1; NUS201H0, NUS301H0, NUS302H0, NUS303H0, NUS304H0, NUS401H0*

6. 0.5 FCE at the 400-series from: field course, EEB403H0, EEB403H1, EEB405H0, EEB405H1, EEB406H0, EEB406H1, EEB407H0, EEB407H1, EEB410H0, EEB410H1; seminar EEB491H1 EEB495H1 EEB496H1; independent research project course, EEB497H1, EEB498Y1/EEB499Y1 (concurrent with research issues course EEB488H1); advanced lecture/discussion course, EEB428H1, EEB430H1, EEB433H1, EEB440H1, EEB455H1, EEB459H1, EEB460H1, EEB465H1, EEB466H1; ENV432H1

Description of Proposed Changes:

Rationale:
Removing retired courses and adding new courses.

Impact:

Consultation:
Internal departmental committee

Resource Implications:

Ecology and Evolutionary Biology Specialist

Completion Requirements:

(12 FCEs including at least 4.0 FCEs at the 300+ series level, 1.0 of which must be at the 400 series level)

First Year (3.0 FCEs): BIO120H1; BIO130H1; (CHM135H1, CHM136H1)/CHM151Y1; (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1

1. 2.0 FCEs: BIO220H1 (ecology and evolutionary biology); BIO230H1 (molecular and cell biology); BIO260H1/HMB265H1 (genetics); BIO251H1/BIO270H1/PSL300H1/ENV234H1 (plant or animal form and function/environmental biology)

*More information about NUS courses and programs can be found on the Biology Calendar section

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More information about NUS courses and programs can be found on the Biology Calendar section
Ecology and Evolutionary Biology (FAS), Department of Biology; Please note: ENV234H1 environmental biology cannot be substituted with EEB375H1.

2. 0.5 FCE in statistics from: EEB225H1 (recommended)/STA220H1/STA257H1/STA288H1/GGR270H1/PSY201H1

3. 0.5 FCE in core evolution from: EEB318H1, EEB323H1, EEB362H1

4. 0.5 FCE in core ecology from: EEB319H1, EEB320H1, EEB321H1 (both are recommended), EEB328H1

5. 0.5 FCE in organismal biology from: EEB263H1, EEB266H1, EEB267H1, EEB268H1, EEB330H1, EEB331H1, EEB340H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1

6. 1.0 FCE at 300+ series, from: EEB313H1, EEB318H1, EEB319H1, EEB320H1, EEB321H1, EEB322H1, EEB323H1, EEB324H1, EEB325H1, EEB328H1; EEB330H1, EEB331H1, EEB340H1, EEB356H1, EEB362H1, EEB365H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB390H1, EEB399Y0, EEB428H1, EEB430H1, EEB433H1, EEB440H1, EEB455H1, EEB459H1, EEB460H1, EEB465H1, EEB466H1, EEB491H1, EEB492H1/EEB492Y1, EEB495H1, EEB496H1; EHB352H1; ENV334H1, ENV432H1; ENV395Y1; NUS301H0, NUS302H0, NUS303H0, NUS304H0, NUS401H0*

7. 1.0 to 1.5 FCEs in at least two of the three following categories: (1) one field course (0.5 FCE) from EEB403H0, EEB405H0, EEB406H0, EEB407H0, EEB407H1, EEB410H0, EEB410H1; (2) one seminar (0.5 FCE) from EEB495H1; and/or (3) one independent research course (0.5 FCE) from EEB497H1/(1.0 FCE) from EEB498Y1

Sub-total = 9.0 or 9.5 FCEs (depending on options chosen in #7)

8. Select the remaining FCEs for a total of 12.0 FCEs (at least 1.0 must be 300+ series if 1.0 FCE is completed in #7 above) from: BIO251H1, BIO270H1/PSL300H1, BIO271H1/PSL301H1; all EEB courses (excluding EEB197H1, EEB198H1, EEB199H1, EEB202H1, EEB208H1, EEB214H1, EEB215H1); EHB352H1; ENV334H1, ENV432H1; JHE353H1, JHE355H1; and no more than 1.0 FCE from the following (note that some courses may require prerequisites that are not listed within this program): ANT336H1, ANT333Y1, ANT335Y1, ANT338H1, ANT430H1, ANT436H1; CSB328H1, CSB340H1, CSB349H1, CSB350H1, CSB352H1, CSB353H1, CSB430H1, CSB431H1, CSB452H1, CSB458H1, CSB472H1, CSB474H1; ENV346H1; FOR200H1, FOR201H1, FOR301H1, FOR306H1, FOR307H1, FOR413H1, FOR416H1, FOR417H1, FOR418H1; GGR201H1, GGR203H1, GGR205H1, GGR206H1, GGR272H1, GGR273H1, GGR305H1, GGR307H1, GGR308H1; MAT221H1; MGY340H1; NUS201H0, NUS301H0, NUS302H0, NUS303H0, NUS304H0, NUS401H0*; PSY100H1, PSY260H1, PSY270H1, PSY280H1, PSY290H1, PSY305H1, PSY390H1, PSY397H1, PSY474H1, PSY492H1, PSY497H1 (note that many PSY courses have limited enrolment)

*More information about NUS courses and programs can be found on the Biology Calendar section

Total = 12 FCEs

NOTE: Students may wish to concentrate in ecology, evolutionary biology, or behaviour. Recommended EEB, EHJ and JHE courses for these concentrations are as follows:

Ecology: EEB255H1, EEB319H1, EEB320H1, EEB321H1, EEB328H1, EEB365H1, EEB428H1, EEB433H1, EEB440H1, EEB465H1, EEB495H1, ENV432H1

Evolutionary Biology: EEB323H1, EEB324H1, EEB325H1, EEB362H1, EEB390H1, EEB440H1, EEB459H1, EEB460H1, EHB352H1; JHE353H1, JHE355H1

Behaviour: EEB322H1, EEB455H1; EEB496H1

Description of Proposed Changes:

Rationale:
Ecology and Evolutionary Biology (FAS), Department of

Removing retired courses and adding new courses.

**Impact:**

**Consultation:**
Internal departmental committee

**Resource Implications:**

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**Environmental Biology Major**

**Completion Requirements:**

(8 FCEs including at least 2.0 FCEs at 300+ series with at least 0.5 FCE at the 400 level series)

First Year (2.0 FCEs): BIO120H1; (CHM135H1, CHM136H1)/CHM151Y1; MAT135H1/MAT136H1/MAT137Y1/ MAT221H1/MAT223H1 or PHY131H1/PHY151H1 or BIO130H1

1. 2.0 FCEs: BIO220H1 (ecology and evolutionary biology); ENV234H1 (cannot be substituted with EEB375H1 for this requirement), ENV334H1 (environmental biology); EEB225H1 (recommended)/STA220H1/STA257H1/STA288H1/ GGR270H1/PSY201H1 (statistics)

2. 0.5 FCE in biological diversity and function from: BIO251H1, BIO270H1; EEB266H1, EEB267H1, EEB268H1, EEB340H1; BIO260H1/HMB265H1 (note that both require BIO130H1 and BIO230H1)

3. 0.5 FCE in physical environment from: CHM210H1; ENV237H1, ENV238H1; ESS223H1, ESS261H1, ESS262H1; GGR201H1, GGR203H1, GGR205H1, GGR206H1; PHY131H1, PHY132H1, PHY151H1, PHY152H1

4. 1.0 FCE in core ecology from: EEB319H1, **EEB320H1**, EEB321H1, EEB322H1, EEB324H1, EEB328H1

5. 1.5 FCEs from: EEB313H1, EEB319H1, **EEB320H1**, EEB321H1, EEB322H1, EEB323H1, EEB324H1, EEB325H1, EEB328H1, EEB365H1, EEB375H1, EEB386H1, EEB403H0, EEB403H1, EEB405H0, EEB405H1, EEB406H0, EEB406H1, EEB407H0, EEB407H1, EEB410H0, EEB410H1, EEB428H1, EEB430H1, EEB433H1, EEB497H1, EEB498Y1, EEB499Y1; ENV316H1, ENV337H1, ENV432H1, ENV452H1; ESS311H1, ESS361H1, ESS362H1, ESS462H1, ESS463H1, ESS464H1; FOR305H1, FOR307H1, FOR418H1; GGR305H1, GGR307H1, GGR308H1; JFG470H1

6. 0.5 FCE at the 400-series from: field course EEB403H0, EEB403H1, EEB405H0, EEB405H1, EEB406H0, EEB406H1, EEB407H0, EEB407H1, EEB410H0, EEB410H1/FOR418H1; seminar/lecture course EEB428H1, EEB430H1, EEB433H1, **EEB491H1**, EEB495H1, ENV432H1, ENV452H1; ESS462H1, ESS463H1, ESS464H1; JFG470H1; EEB497H1, independent research project course EEB498Y1 (concurrent with research issues course EEB488H1), EEB499Y1

This program can be combined with other Environmental programs (see School of the Environment), as well as Science (e.g., Chemistry, Earth Sciences) and Social Science (e.g., Economics) programs.

**Description of Proposed Changes:**

**Rationale:**
Adding new courses.

**Impact:**

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Environmental Biology Minor

Completion Requirements:

(4 FCEs; must include at least one full-course equivalent at the 300+ series)

1. 1.5 FCEs: BIO120H1; BIO220H1; ENV234H1 (cannot be substituted with EEB375H1)

2. 0.5 FCE in organismal biology: EEB266H1, EEB267H1, EEB268H1

3. 2.0 FCEs (at least 1.0 FCEs at 300+ series)

A. core ecology and evolution (no more than 1.0 FCEs): EEB318H1, EEB319H1, EEB320H1, EEB321H1, EEB322H1, EEB324H1, EEB328H1

B. biological diversity (no more than 0.5 FCE): EEB263H1, EEB266H1, EEB267H1, EEB268H1; EEB330H1, EEB331H1, EEB340H1, EEB380H1, EEB382H1, EEB384H1, EEB386H1, EEB388H1

C. field courses (no more than 0.5 FCE): EEB403H0, EEB403H1, EEB405H0, EEB405H1, EEB406H0, EEB406H1, EEB407H0, EEB407H1, EEB410H0, EEB410H1

D. no more than 1.0 FCEs from: BIO251H1, EEB255H1, EEB362H1, EEB365H1, EEB428H1, EEB433H1; ENV334H1 (recommended), ENV432H1; NUS201H0, NUS301H0, NUS302H0, NUS303H0, NUS304H0, NUS401H0*

*More information about NUS courses and programs can be found on the Biology Calendar section

Description of Proposed Changes:

Rationale:

Removing retired course and adding new course.

Impact:

Consultation:

Internal departmental committee

Resource Implications:

2 New Courses:

EEB320H1: Dynamics of Ecosystem Processes

Contact Hours:

Lecture: 24 / Practical: 24

Description:
This course explores the relationships and feedback between biological communities and the abiotic factors of ecosystems. The course will cover the biogeochemical dynamics of energy and nutrients through ecosystem development and the effects of global change on these processes. The lab component of the course will apply lecture concepts and tools to specific case studies.

**Prerequisites:**
BIO220H1

**Corequisites:**

**Exclusions:**

**Recommended Preparation:**
ENV234H1

**Breadth Requirements:**

**Distribution Requirements:**

**Competencies:**
- *Communication:* notably; *Critical and Creative Thinking:* extensively; *Information Literacy:* notably
- *Quantitative Reasoning:* extensively; *Social and Ethical Responsibility:* notably

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

**Rationale:**
Ecosystem Ecology is a central component of Ecology and Evolutionary Biology, and has been identified through EEB’s internal discussions and external evaluation (cyclical review through FAS) as a missing component in our programs. Offering this course is necessary to meet the academic goals of the department and to offer students the breadth of knowledge and skills required in our field. We have recently hired an Ecosystem Ecologist (Shelby Riskin), with the goal of meeting this need in the department.

**Consultation:**
Internal and external consultation

**Resources:**
Lab and computer resources for practical sections.

**Budget Implications:** The academic unit will provide the resources required for this course from existing budget.

**Overlap with Existing Courses:**

**Programs of Study for Which This Course Might be Suitable:**
EEB Specialist and Major, Biology Specialist and Major, Biodiversity and Conservation Biology Major, Environmental Biology Major

**Estimated Enrolment:**
40

**Instructor:**
S. Riskin
<table>
<thead>
<tr>
<th>Impact on Programs:</th>
<th>This proposal triggers modifications in the unit's program(s)</th>
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</thead>
<tbody>
<tr>
<td>Contact Hours:</td>
<td>Lecture: 24</td>
</tr>
<tr>
<td>Description:</td>
<td>Seminar course in biodiversity and conservation biology, emphasizing critical thinking and the synthesis of ideas crossing disciplinary boundaries. Group discussions among peers, facilitated by faculty, and student presentations. Discussions include critical analysis of research and review articles in the primary literature, with a focus on recent developments in biodiversity science and conservation biology. Evaluation based on presentations, participation in class discussions, and written assignments. (Note students may take this course only once.)</td>
</tr>
<tr>
<td>Prerequisites:</td>
<td>A minimum of 1.0 FCE in EEB courses at the 300+ level (EEB365H1 highly recommended)</td>
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<tr>
<td>Corequisites:</td>
<td></td>
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<tr>
<td>Exclusions:</td>
<td>EEB495H1</td>
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<tr>
<td>Recommended Preparation:</td>
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<tr>
<td>Breadth Requirements:</td>
<td></td>
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<tr>
<td>Distribution Requirements:</td>
<td></td>
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<tr>
<td>Competencies:</td>
<td>Communication: extensively; Critical and Creative Thinking: extensively; Information Literacy: extensively; Quantitative Reasoning: notably; Social and Ethical Responsibility: notably</td>
</tr>
<tr>
<td>Experiential Learning:</td>
<td>Research: notably; Other: none</td>
</tr>
<tr>
<td>Rationale:</td>
<td>Biodiversity and conservation biology are central themes in ecology and evolutionary biology, and increasingly relevant as populations decline and species are lost in the Anthropocene. The EEB major in biodiversity and conservation biology is lacking an upper-level course that draws on the conservation and biodiversity expertise of many of EEB’s instructors. For example, new research advances by faculty include testing the importance of disease, parasites and invasive species for conservation; evaluating if spatial configurations of protected areas will allow species to migrate in response to changing climate; determining when and how lags in population dynamics mask extinction trajectories; measuring the evolutionary loss of diversity when ex-situ conservation measures, like seed storage facilities, are used; and testing how changing environmental conditions alter mutation rates and the potential for evolutionary rescue of populations. The biodiversity and conservation seminar will expose students to these emerging issues and provide them with the tools to critically evaluate them.</td>
</tr>
<tr>
<td>Consultation:</td>
<td>Internal consultation.</td>
</tr>
<tr>
<td>Resources:</td>
<td>Budget Implications: The academic unit will provide the resources required for this course from existing budget.</td>
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</table>
Overlap with Existing Courses:
The course has been developed to ensure that there is no overlap with existing EEB courses.

Programs of Study for Which This Course Might be Suitable:
Biodiversity and Conservation Biology Major, EEB Specialist and Major, Biology Specialist and Major, Environmental Biology Major

Estimated Enrolment:
15

Instructor:
Several have contributed to the outline and development, including professors Rifkin, Rochman, Krokosek, Fortin, Jackson and Gilbert. The course instructor would vary from year to year to take advantage of the diverse research in conservation and biodiversity in EEB.

2 Course Modifications:

EEB322H1: Behaviour and Behavioural Ecology

Prerequisites:
BIO220H1; and a course in statistics from EEB225H1 (recommended), PSY201H1, STA220H1/STA250H1/STA257H1/STA288H1, GGR270H1, HMB325H1

Rationale:
Added the new STA288H1 course that was missing from the list of electives that students can take under statistics prerequisites.

Consultation:
STA288H1 was added to all of our courses and programs that require a statistics course last year. STA288H1 should have been added to EEB322H1, but for some reason it wasn’t included within the list of stats electives. The Department of Statistics was aware that we were adding it along with the other stats courses offered.

Resources:

EEB495H1: Seminar in Ecology and Evolutionary Biology

Exclusions:
Previous: EEB496H1
New: EEB491H1

Rationale:
Revised prerequisite

Consultation:
Internal departmental committee

Resources:

2 Retired Courses:

EEB330H1: Systematic Botany

Rationale:
The course was taught by an instructor who has now retired for a few years. We have had a sessional instructor teach the course but the enrolment has been very low. The department believes it is time to retire the course and develop a newer version to replace it with relevant material and research that is happening today.
EEB496H1: Seminar in Behaviour and Behavioural Ecology

Rationale:
This course has not been offered for the last four years. One of the instructors who co-taught it has been retired for the last few years and the other instructor has been on admin leave, as well as on sabbatical. The subject area is now incorporated within our EEB495H1 seminar course.

Consultation:
Internal discussion.
1 Minor Program Modification:

Economics Major

Completion Requirements:

**Program Course Requirements: 7 full courses or their equivalent**

**First Year (2.0 FCE):**

1. (ECO101H1, ECO102H1) or (ECO100Y1/EFCO105Y1/EFCO100Y1);
2. MAT133Y1/(MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1

**Second Year (Core Courses courses, 3.0 FCE):**

1. ECO200Y1/ECO204Y1/ECO206Y1,
2. ECO202Y1/ECO208Y1/ECO209Y1,
3. ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1, STA237H1, STA255H1)/(STA257Y1, STA261H1)

**Third and Higher Years (ECO Electives, 2.0 FCE):**

1. 1.5 FCE 300+ level series ECO courses
2. At least 0.5 FCE 400-level 400 level ECO course

**Notes:**

1. Eligibility for all Economics programs is based, in part, on attaining a minimum grade in ECO101H1 and ECO102H1 (or ECO105Y1). Students are reminded that in order to achieve the required minimum grade in the above-mentioned courses, they may repeat a specific passed course only once as per Faculty regulations.
2. Students in the Major program considering graduate studies in Economics are advised to take the more mathematical stream courses (ECO206Y1, ECO208Y1), and also some or all of the 300-level advanced micro, macro, and econometrics sequence (ECO325H1, ECO316H1/ECO326H1, and ECO375H1).
3. Students considering graduate studies in Economics are also encouraged to take more than the minimum amount and level of math. Students should especially consider MAT221H1/MAT223H1/MAT240H1 (Linear Algebra), MAT235Y1/MAT237Y1 (Multivariate Calculus), MAT246H1 (Abstract Mathematics), or even consider doing a Minor program in Mathematics.
4. Students should pay careful attention to the courses they choose to meet the 200-level statistics requirements. The accepted combinations are precisely as stated. In particular, (STA237H1+STA238H1), (STA247H1+STA248H1), and (STA257H1+STA261H1) are distinct packages of courses, and the elements cannot be combined any other way:
5. Students combining other programs with Economics need to confirm that their chosen statistics courses meet the requirements of both programs. Besides the combinations noted in descriptions of the ECO programs; the only other accepted combinations for ECO Major program; and course prerequisite conditions; are precisely:
6. Students in the Major program in Economics cannot be enrolled in the Minor program in Environmental Economics.

**Description of Proposed Changes:**
Changing the sequence of courses ONLY in order to flag our active courses (ECO101H1, ECO102H1, ECO105Y1) to prospective students. ECO100Y1 will soon be retired.

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Rationale:**
Minor edits in order to be more precise and consistent throughout our program listings. Creates less confusion for prospective students. Removing Note #5 and including STA247H1 and STA248H1 into the program listing is more explicit.

**Impact:**

**Consultation:**
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

**Resource Implications:**

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**47 Course Modifications:**

**ECO210H1: Mathematical Methods for Economic Theory**

**Description:**

An introduction to mathematical methods commonly used in economic theory. Topics include: multivariate calculus, concavity and convexity, unconstrained multivariate optimization, multivariate optimization subject to equality or inequality constraints and differential equations.

**Exclusions:**

*Previous:*

*New: MAT235Y1, MAT237Y1*

**Rationale:**

Both MAT235Y1 and MAT237Y1 were listed as exclusions historically. Last occurrence was in the 2010 Fall - 2011 Winter Calendar. Not sure why it was removed. Making edits to course description to highlight key topics covered in the course.

**Consultation:**

Associate Chair, Undergraduate; ECO Undergraduate Curriculum Committee; Email to Math Department.

**Resources:**
ECO220Y1: Introduction to Data Analysis and Applied Econometrics

**Exclusions:**
- GGR270H1, PSY201H1, PSY202H1, SOC202H1, SOC252H1, SOC300H1, STA220H1, STA221H1, STA247H1, STA248H1

**Rationale:**
SOC300H1 is no longer being offered. The exclusions should be SOC202H1 and SOC252H1. Both SOC202H1 and SOC252H1 already have ECO220Y1 listed as an exclusion. According to Bethany White (Associate Chair, Undergraduate Studies in Statistics) STA247H1 is more of a theoretical course in probability, so there is not enough overlap from their perspective to consider ECO220Y1 as an exclusion. Also, STA247H1 does NOT currently list ECO220Y1 as an exclusion so this will now match with STA's calendar listing.

**Consultation:**
- ECO220Y1 Course Coordinator; Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Email to Sociology Department; Bethany White, Associate Chair, Undergraduate Studies in Statistics

**Resources:**

ECO227Y1: Foundations of Econometrics

**Description:**
A rigorous introduction to probability and mathematical statistics intended for students in Economics Specialist programs and economics specialists. Probability and estimation theory, sampling distributions, hypotheses testing, multiple regression analysis. Students will learn the tools used in economics and finance to model and address randomness and uncertainty.

**Exclusions:**
- STA237H1, GGR270H1, PSY201H1, STA238H1, SOC300H1, STA247H1, STA248H1, STA255H1, STA257H1, STA261H1

**Rationale:**
ECO220Y1 and ECO227Y1 are no longer exclusions for each other, therefore we have conducted a thorough review of the remaining exclusions. ECO227Y1 is more of a mathematical course and is sufficiently different compared to the quantitative course offerings from GGR, PSY, and SOC. STA237H1 and STA238H1 were recently introduced by the Statistics Department and cover material similar to ECO227Y1 and thus should be added. Furthermore, both STA237H1 and STA238H1 currently list ECO227Y1 as an exclusion.

**Consultation:**
- ECO227Y1 Course Instructor; Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Emails to Geography, Psychology, Sociology, and Statistics Departments

**Resources:**

ECO305H1: Economics of Accounting

**Description:**
The economic impact of accounting rules and practices for firms and financial contracts. Topics include: economic models of agency, economics of optimal accounting rules such as government regulation of corporate disclosure and the economic returns to financial reporting. No previous knowledge of accounting is required; the basic language of financial accounting will be covered.

**Prerequisites:**
| Rationale: | The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students. |

| Consultation: | Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics |

| Resources: |  |

| ECO306H1: American Economic History |

| Description: | A survey of American economic history from the ante-bellum period to the present. Potential topics include: the rapid growth of the American economy in the late 19th and early 20th century; causes of the onset of the Great Depression; the economic impact of slavery and its aftermath; health and demographic trends; and 20th century trends in inequality. |

| Prerequisites: | ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1) |

| Rationale: | The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students. |

| Consultation: | Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics |

| Resources: |  |
ECO310H1: Empirical Industrial Organization

Description:

The quantitative analysis of firms' strategies in real-world industries, using tools from applied microeconomics and statistics. Topics include: studies of monopoly, oligopoly, imperfect competition, and the estimation of demand and cost functions that underpin these markets.

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1, ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1/STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:

Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO313H1: Environmental Economics and Policies

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1, ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1/STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:

Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

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ECO314H1: Energy and the Environment

Description:

This course surveys important features of energy markets and related environmental challenges. One of the central objectives is to provide an understanding of the key economic tools needed to analyse these markets. A related objective is the development of a framework for understanding the public discourse on energy and the environment. Topics include: the hydrocarbon economy (oil, natural gas and coal), electricity markets, global warming and other externalities, renewable energy, conservation, carbon taxes and ‘cap-and-trade’.

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1)/(STA247H1, STA248H1 STA255H1)/ (STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:

Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO324H1: Economic Development

Description:

This course critically analyzes issues related to economic development and the associated policy responses. Tools from micro and macroeconomic theory are employed, as well as the critical assessment of empirical evidence. Topics may include: education, health, credit markets, inequality, and the role of foreign aid.

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/ (STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have.

Resources:
been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO325H1: Advanced Economic Theory - Macro

Description:
A development of the microeconomic foundations of macroeconomic theory to expand students' analytic skills by constructing and solving macroeconomic models. Topics may include: dynamic choice, neoclassical growth theory, uncertainty and rational expectations, business cycles, as well as fiscal and monetary policy.

Prerequisites:
ECO208Y1/ECO202Y1 (70%) / ECO209Y1; ECO209Y1; ECO220Y1 (70%)/ECO227Y1/(STA237H1 STA220H1 (70%), STA238H1 STA255H1 (70%))/STA247H1 STA237H1 (70%), STA248H1 STA238H1 (70%)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO326H1: Advanced Microeconomics - Game Theory

Prerequisites:
ECO200Y1(70%)/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1 (70%)/ ECO227Y1/(STA237H1 STA220H1 (70%), STA238H1 STA255H1 (70%))/STA247H1 STA237H1 (70%), STA248H1 STA238H1 (70%)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO331H1: Behavioural and Experimental Economics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/ (STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO332H1: Economics of the Family

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/ (STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and
STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO334H1: The Political Economy of Media

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO336H1: Public Economics

Description:
Theory of taxation and public goods, and quantitative methods for program evaluation. Additional topics include: taxation and income distribution; environmental policy; and the political economy of government policy.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have
Economics (FAS), Department of

been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO337H1: Public Economics (for Commerce)

Description:

An introduction to the economics of government similar to ECO336H1, but with greater focus on issues in business and financial economics. Additional topics include: business tax planning and corporate financial policy; taxation of saving and risk-taking; and government business enterprises.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1 / (STA237H1, STA220H1, STA238H1, STA255H1) / (STA247H1, STA237H1, STA248H1, STA238H1) / (STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO338H1: Economics of Careers

Description:

The economic analysis of careers from the perspectives of both workers and employers. How do people decide what to study, what careers to pursue, and when to change jobs? How do these decisions interact with the structure of firms? The impact of specialization and the division of labour on the evolution of careers is considered, as are the role of cognitive and communication skills in the labour market.
Economics (FAS), Department of

**Prerequisites:**
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1)

**Rationale:**
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Consultation:**
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

**Resources:**

**ECO339H1: Labour Economics: Employment, Wages and Public Policy**

**Description:**
Using tools from microeconomic theory and statistics, this course introduces students to the study of labour markets, focusing on employment and wage determination, and the application of labour economics to public policy. Topics may include: labour supply, labour demand, estimating the impact of welfare programs, minimum wages, and other labour market interventions.

**Prerequisites:**
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1)

**Rationale:**
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Consultation:**
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

**Resources:**
ECO340H1: Labour Economics: The Distribution of Earnings

Description:

Using tools from microeconomic theory and statistics, this course studies the determinants of wages across labour markets. Topics include: the theory of compensating differentials, human capital, discrimination, immigration, unions, and alternative models of compensation. In addition, students are introduced to microeconomic models of unemployment. Throughout the course, there is an emphasis on the evaluation of empirical evidence.

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:

Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO349H1: Money, Banking and Financial Markets

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1, ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:

Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany
Economics (FAS), Department of

White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO358H1: Financial Economics I

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1, ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO362H1: Economic Growth

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1, ECO220Y1/ECO208Y1/ECO209Y1; ECO209Y1, ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:
ECO364H1: International Trade Theory

Description:

An examination of the causes and consequences of international trade. The first half develops traditional models of comparative advantage. The second half examines more recent theoretical and empirical work on trade & wages, the political economy of trade, outsourcing, and firm heterogeneity.

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/ (STA247H1 STA237H1, STA248H1 STA238H1)/ (STA257H1, STA261H1)

Rationale:

The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:

Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO368H1: Economics of Conflict

Prerequisites:

ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/ (STA247H1 STA237H1, STA248H1 STA238H1)/ (STA257H1, STA261H1). Note: Students with ECO100Y1 (67%)/ (ECO101H1 (63%), ECO102H1 (63%))/ ECO105Y1 (80%), plus a full-year of quantitative methods/statistics (e.g., POL222H1, POL232H1 POL242Y1), and who are enrolled in the International Relations or Peace, Conflict and Justice Major or Specialist programs may take this course with Permission of the Instructor.

Rationale:

POL242Y1 is no longer being offered. POL222H1 (Introduction to Quantitative Reasoning I) and POL232H1 (Introduction to Quantitative Reasoning II) are both quantitative methods courses which are deemed suitable as prerequisites for ECO368H1 for students who do not have the other relevant ECO or STA courses. The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair,
Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Consultation:**
- RE: POL courses (Gillian Hamilton, Associate Chair of Undergraduate Affairs; Munk School of Global Affairs and Public Policy; Political Science Department).
- RE: STA courses (Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics)

**Resources:**

### ECO369H1: Health Economics

**Prerequisites:**
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1, ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1), (STA247H1 STA237H1, STA248H1 STA238H1), (STA220H1, STA261H1)

**Rationale:**
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Consultation:**
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

**Resources:**

### ECO372H1: Data Analysis and Applied Econometrics in Practice

**Prerequisites:**
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA220H1, STA261H1)

**Rationale:**
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Consultation:**
ECO374H1: Forecasting and Time Series Econometrics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1(70%)/ECO227Y1/(STA237H1 (70%), STA238H1 (70%))/STA247H1 (70%))/STA248H1 (70%))/STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO375H1: Applied Econometrics I

Description:
Introduction to econometrics. Statistical foundations and the interpretation of multiple regression models, with an emphasis on cross-sectional data. Application of regressions to a wide variety of economic questions and data sources, including the use of statistical software. Problems in the identification of causality, and an introduction to methods of addressing common statistical issues.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1(70%)/ECO227Y1/(STA237H1 (70%), STA238H1 (70%))/STA247H1 (70%))/STA248H1 (70%))/STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.
Economics (FAS), Department of Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO380H1: Markets, Competition, and Strategy

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1 / (STA237H1 STA220H1 STA238H1 STA255H1) / (STA247H1 STA237H1, STA248H1 STA238H1) / (STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO381H1: Personnel Economics

Description:
An examination of selected material on compensation and incentives in organizations. Topics include: recruitment and hiring, training, turnover, downsizing, motivating workers, teams, allocating authority and task assignment.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1 / (STA237H1 STA220H1 STA238H1 STA255H1) / (STA247H1 STA237H1, STA248H1 STA238H1) / (STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more
translucent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO401H1: Topics in Economic Policy

Description:
This course covers basic issues in the theoretical and empirical evaluation of public policy. Sample topics include: income redistribution through taxation and the provision of social insurance and public goods, the mitigation of externalities, and welfare analysis in behavioral models.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1); at least 1.0 one FCE in ECO at the 300+ level, 300+ level or higher.

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO402H1: Topics in Health Economics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1); at least 1.0 one FCE in ECO at the 300+ level, 300+ level or higher.

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have
been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

**ECO403H1: Topics in Development Economics and Policy**

**Prerequisites:**
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1) ; at least 1.0 one FCE in ECO at the 300+ level. 300 level or higher.

**Rationale:**
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

**ECO404H1: Topics in Managerial Economics**

**Description:**

Applies quantitative economic methods to real world business-oriented cases. Sample topics include: new product design, decision making under uncertainty, market segmentation and price discrimination, inventory analysis, game theoretic analysis of price wars, financial portfolio design, and optimal pricing. Involves substantial modeling in Excel, regression analysis, optimization methods, and financial reports.

**Prerequisites:**
ECO200Y1(75%)/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA220H1, STA255H1)/(STA237H1, STA220H1, STA238H1)/(STA247H1, STA237H1, STA248H1, STA261H1); ECO372H1/ECO374H1/ECO375H1; at least 1.0 one FCE in ECO at the 300+ level. 300 level or higher.

**Rationale:**
Minor edits to prerequisite text in order to be more precise and consistent in all our 400-level course descriptions. In this case, students are required to have 2nd year ECO/STA in order to take ECO372H1/ECO374H1/ECO375H1. Listing those 2nd year prerequisites was deemed redundant. This is now in line with the course descriptions of ECO416H1, ECO418H1 etc.

Consultation:
Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee

Resources:

ECO406H1: Developmental Macroeconomics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA227H1, STA248H1 STA238H1)/(STA257H1, STA261H1) ; at least 1.0 one FCE in ECO at the 300+ level. 300 level or higher.

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO407H1: Competing Views in Macroeconomic Theory and Policy

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1 /(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA227H1, STA248H1 STA238H1)/(STA257H1, STA261H1) ; at least 1.0 one FCE in ECO at the 300+ level. 300 level or higher.

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
56
ECO409H1: Topics in Money, Banking, and Finance

**Prerequisites:**
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1 / (STA237H1, STA220H1, STA238H1, STA255H1) / (STA247H1, STA237H1, STA248H1, STA238H1) / (STA257H1, STA261H1); at least 1.0 FCE in ECO at the 300+ level. 300 level or higher.

**Rationale:**
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

**Consultation:**
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

**Resources:**

ECO410H1: Mergers and Competition Policy

**Prerequisites:**
Previous: ECO200Y1 / ECO204Y1/ECO206Y1, ECO220Y1/ECO227Y1 / (STA220H1, STA255H1) / (STA237H1, STA238H1) / (STA257H1, STA261H1), at least 1.0 ECO FCE at the 300+ level or higher
New: ECO372H1 / ECO374H1/ECO375H1; at least 1.0 FCE in ECO at the 300+ level.

**Rationale:**
ECO372H1/ECO374H1/ECO375H1 should be required to ensure that all students have experience with applied empirical methods within the discipline of Economics. The second year micro and econometrics/statistics are redundant since they are captured in the prerequisites for ECO372H1/ECO374H1/ECO375H1.

**Consultation:**
ECO410H1 course instructor; Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee;

**Resources:**

ECO414H1: Energy and Regulation

**Description:**
This course provides a general treatment of the economics of energy markets and the use of regulation in addressing environmental and other issues arising in these markets. A central theme is the search for an appropriate balance between market forces and regulatory/government intervention. Familiarity with tools of microeconomics and statistics/
Econometrics is essential. Topics include: oil, natural gas, coal and electricity markets, global warming and other externalities, networks, feed-in-tariffs, carbon taxes, ‘cap-and-trade’ and incentive regulation.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO220Y1/ECO227Y1 /(STA237H1 STAA220HH, STAA238H1 STAA255H1)/(STA247H1 STAA237H1, STA248H1 STAA238H1)/(STAA257H1, STAA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO417H1: Economic Development Policy: Community Engaged Learning

Description:
An examination of the causes and consequence of poverty in developing countries with a microeconomic focus, and how it relates it to poverty in the developed world, using a 30-hour service placement at a community organization. Importance of community and context specific factors in policy implementation; learn how local organizations have responded. Use of reflection assignments, papers, group work and class discussions to relate to course concepts. Topics include: poverty traps, health, education, and credit. An application to the instructor is necessary. Not available for CR/NCR option.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1 /(STA237H1 STAA220HH, STAA238H1 STAA255H1)/(STAA247H1 STAA237H1, STAA248H1 STAA238H1)/(STAA257H1, STAA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.
ECO419H1: International Macroeconomics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO209Y1; ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO423H1: Economics and Biosocial Data

Description:
This course introduces and critically assesses economic research that uses genetic, neuroscientific, and other biosocial data. We will address questions such as: what are the effects of brain neurochemistry on economic decision-making? What role do nature and nurture play in economic behaviour and outcomes? What can we learn from genoeconomics? What are the policy implications (or lack thereof) of related findings? No previous background in biology or genetics is required.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1); at least 1.0 ECO FCE in ECO at the 300+ level.

Exclusions:
ECO422H1 (Special Topics in Economics: Biology, Genetics and Economics), offered in Winter 2017, 2017

Recommended Preparation:
ECO372H1/ECO374H1/ECO375H1

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO425H1: Business Cycles

Description:
This course builds on material covered in ECO208Y1. Students will learn how to use business cycle models to better understand key empirical features of the macroeconomy. Topics covered include: the financial crisis, monetary policy, fiscal policy, theories of unemployment, and the effects of innovation on economic fluctuations, the Great Depression and the Financial Crisis.

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO209Y1; ECO220Y1/ECO227Y1/(STA237H1, STA220H1, STA238H1, STA255H1)/(STA247H1, STA237H1, STA248H1, STA238H1)/(STA257H1, STA261H1); at least 1.0 ECO FCE in ECO at the 300+ level.

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO435H1: The Economics of Modern China

Prerequisites:
Economics (FAS), Department of

ECO200Y1(70%)/ECO204Y1 (70%)/ ECO206Y1 (70%) ; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1)

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO438H1: Topics in Behavioural Economics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1) ; at least 1.0 one FCE in ECO at the 300+ level, 300 level or higher.

Exclusions:

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO446H1: Advanced Public Economics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO220Y1/ECO227Y1/(STA237H1, STA238H1)/(STA247H1, STA248H1)/(STA257H1, STA261H1) ; at least 1.0 one FCE in ECO at the 300+ level, 300 level or higher.
Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:

ECO499H1: Honours Essay in Applied Microeconomics

Prerequisites:
ECO200Y1/ECO204Y1/ECO206Y1; ECO202Y1/ECO208Y1/ECO209Y1; ECO220Y1/ECO227Y1/(STA237H1 STA220H1, STA238H1 STA255H1)/(STA247H1 STA237H1, STA248H1 STA238H1)/(STA257H1, STA261H1); ECO372H1/ECO374H1/ECO375H1; 3.0 GPA in economics courses; approval of the Associate Chair, Undergraduate.

Rationale:
The Statistics Department added a new sequence “STA237H1, STA238H1” last year to replace STA220H1 and STA255H1 as the required second-year statistics courses for students in the Statistics Major program. The former were added to the Calendar last year however owing to the delay in offering the new sequence, STA220H1 and STA255H1 were not removed until now. STA220H1 and STA255H1 are no longer deemed adequate preparation for upper level ECO courses (just as they are no longer acceptable for upper level STA courses). STA247H1 and STA248H1 have been allowed (see Economics Major Note #5). We plan to remove Note #5 and thus we are adding STA247H1 and STA248H1 under the course prerequisites for upper level ECO courses in order to be more explicit. While STA247H1 and STA248H1 are courses that have typically been taken by students in STA and CSC programs, we do not foresee this change resulting in additional demand with respect to course enrolment. Listing it explicitly only makes it more transparent for students who are pursuing both CSC and ECO programs. Bethany White (Associate Chair, Undergraduate Studies in Statistics) has advised us that they plan to remove the CSC108H1 prerequisite for both STA247H1 and STA248H1 in order to better limit it to CSC students.

Consultation:
Gillian Hamilton, Associate Chair of Undergraduate Affairs; ECO Undergraduate Curriculum Committee; Bethany White, Associate Chair, Undergraduate Studies in Statistics

Resources:
1 Minor Program Modification:

Geographic Information Systems Minor

**Completion Requirements:**

*First Year Geography Courses:* Any 2 courses (1.0 FCE) from GGR100H1/JEG100H1, GGR101H1, GGR107H1, GGR112H1, GGR124H1. 200/300 level GGR courses may also be used to meet this requirement. Contact the Undergraduate Administrator to update your program.

*Methods & Core Courses:* All (2.0 FCEs) of GGR270H1, GGR272H1, GGR273H1, GGR373H1

*Applications:* Any 2 courses (1.0 FCE) from GGR225H1, GGR337H1, GGR372H1, GGR386H1, GGR413H1, GGR414H1, GGR462H1, GGR472H1, GGR473H1, GGR491Y1, GGR492H1, GGR493Y1 (0.5 FCE can be used based on internship), GGR497H1, GGR498H1, GGR499H1, JFG470H1, JFG475H1

Note: At least 1.0 FCE must be 300/400 series courses

**Total FCEs:** 4.0

**Description of Proposed Changes:**

Removal of JFG470H1 and JFG475H1 from the GIS Minor list of "Applications" courses.

**Rationale:**

These courses are not in the Calendar and have not been offered for some time (2011 and 2010, respectively?). There is no intention to offer them again.

**Impact:**

It is possible that there are still students 'in the system' who took these courses; we would assist them on a one-off basis.

**Consultation:**

Forestry has been notified of these changes.

**Resource Implications:**

None

2 Course Modifications:

**GGR340H1: Health Geography**

**Prerequisites:**

2 of GGR270H1, GGR271H1 or the combination of STA220H1 and HST250H1

**Recommended Preparation:**

8.0 FCE's, including one of GGR222H1/GGR223H1 or ENV236H1/JGE236H1

**Rationale:**

Need for students in this course to have a quantitative/statistical methods background.

**Consultation:**

Change made at the request of the regular course instructor (S. Wakefield)

**Resources:**
### JEG100H1: Introduction to Physical Geography and Earth Science

**Exclusions:**
- GGR100H1, ESS102H1, **ESS262H1**, EESA06H3

**Rationale:**
- Distinction between JEG100 and removed exclusion (ESS 262)

**Consultation:**
- Discussions with course instructor, Earth Sciences Associate Chair, and other Physical Geography faculty

**Resources:**
5 Minor Program Modifications:

Fundamental Genetics and its Applications Major

**Description:**

**Previous:**

**New:**

**HMB: Fundamental Genetics and its Applications**

The objective of the HMB: Fundamental Genetics and its Applications specialist and major programs are to provide students with a solid foundation in the biological sciences with a focus on genetics and its applications in medicine, environment and biotechnology.

**Completion Requirements:**

**Required Courses (8.0 FCE, including at least 0.5 FCE at the 400-level)**

**Chemical and Physical Foundations of Biological Systems**

1. (CHM135H1, CHM136H1)/(CHM138H1, CHM139H)/CHM151Y1
   
   *Transfer credits will be accepted in lieu of the chemistry requirements only if they carry a direct exclusion or equivalency to a pre-approved chemistry course*

2. MAT135H1/PHY131H1/PHY151H1/CSC120H1/CSC148H1
3. BCH210H1

**Biological Foundations of Living Systems**

4. BIO120H1, BIO130H1
5. BIO220H1
6. BIO230H1/BIO255H1

**Courses in Fundamental Genetics**

7. HMB265H1/BIO260H1
8. HMB321H1

9. 0.5 FCE from: HMB360H1/HMB421H1/HMB435H1/HMB437H1/HMB474H1/BCH311H1/BCH311H1/BCH425H1/BCH426H1/
    BCH440H1/BCH445H1/BCH448H1/CBS328H1/CBS331H1/CBS340H1/CBS349H1/CBS351Y1/CBS353H1/CBS428H1/
    CBS429H1/EEB318H1/EEB323H1/EEB365H1/EHJ352H1/MGY314H1/MGY315H1/MGY340H1/MGY428H1/
    MGY470H1/PSL350H1

**Courses in Applied Genetics**

10. HMB201H1
11. HMB301H1/HMB360H1/BCH311H1/CSB349H1 ECG369H1/PSL350H1

12. 0.5 FCE from: HMB301H1/HMB401H1/HMB431H1/HMB436H1/HMB441H1/HMB489H1/BCH311H1/
    BCH340H1/BCH350H1/BCH441H1/BCH447H1/CSB352H1/CSB458H1/CSB459H1/CSB472H1/CSB473H1/
    CSB474H1/EEB325H1/EEB459H1/EEB460H1/NFS487H1/PHL384H1/PSL350H1/PSL404H1/PSY390H1

**Data Analysis and Research-Based Courses**
13. 0.5 FCE in statistics: HMB325H1/EEB225H1/STA220H1/STA288H1/PSY201H1

14. 0.5 FCE from a research-based or lab course: HMB311H1/HMB314H1/MGY315H1/HMB342H1/HMB360H1/HMB490Y1 HMB496Y1 /*HMB496Y1 HMB499Y1 */HST373H1/MGY314H1/MGY377H1/MGY378H1

*A research project from a different unit may be accepted with prior written approval from Human Biology if the course is not counting toward a different program.

**Fundamental Genetics and its Applications Major Notes:**

1. Courses can only count toward one requirement, even if listed as options to multiple requisites of the program.
2. Not all courses listed have priority enrolment for Fundamental Genetics and its Applications majors. Students are responsible for checking priority of courses and meeting course prerequisites for courses they wish to take.
3. The Fundamental Genetics and its Applications major cannot be paired with any other Human Biology Program managed major program.

**Description of Proposed Changes:**

Added a program description.
- Removed courses: CHM138H1/CHM139H1/ECO369H1/HMB325H1
- Removed HMB499Y1. Added HMB490Y1.
- CSB349H1 was added where PSL350H1/BCH311H1 existed.
- Added PSY201H1 to statistics requirement.

**Rationale:**

Program description was missing.  
Courses (CHM138H1/CHM139H1/ECO369H1/HMB325H1) aren't offered or retired.  
Removed HMB499Y1 because it was never intended that students use two research project towards any of our programs, leftover from when HMB499Y1 was our primary 4th year project, now HMB496Y1 is. Students may also choose to do a community engaged full year course HMB490Y1, that we proposed last year, we are adding it to programs this year.  
Our students take any of BCH311H1/CSB349H1/PSL350 (mostly dependent on if they are enrolled in other majors or minors.) Currently doing manual substitutions on Degree Explorer.  
We will use any statistics course, we are normalizing the options across our programs.

**Impact:**

Minor, students will have to ask for fewer exceptions. They won't see course options that don't exist.

**Consultation:**

The details of the course changes were reviewed with the Department of Cell and Systems Biology, who were supportive of the addition of CSB349H1. Also, regarding the ECO369 removal, we consulted with Gillian Hamilton, who agreed with our rationale.

**Resource Implications:**

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**Global Health Major**

**Completion Requirements:**

**Required Courses (8.0 FCE, including at least 0.5 FCE at the 400-level)**

**Chemical and Physical Foundations of Biological Systems**

1. (CHM135H1, CHM136H1)/*(CHM138H, CHM139H)/CHM151Y1 Transfer credits will be accepted in lieu of the chemistry requirements only if they carry a direct exclusion or equivalency to a pre-approved chemistry course.
Human Biology Program

2. MAT135H1/PHY131H1/PHY151H1

Biological Foundations of Living Systems

3. BIO120H1, BIO130H1
4. BIO230H1/BIO255H1
5. HMB265H1/BIO260H1
6. PSL300H1, PSL301H1
7. 1.0 FCE from: HMB302H1/ANA300Y1/ANA301H1/BCH311H1/CSB349H1/CSB351Y1/IMM340H1/IMM350H1/MGY377H1/MGY378H1/PSL350H1

Global Health Concentration Courses

8. 0.5 FCE from: PHS100H1/PSY100H1/INS201Y1/ANT100Y1/SOC101Y/SOC100H1/ECO100Y/ECO101H1
Transfer credits from AP and IB psychology are not accepted.
9. HMB203H1

10. 0.5 FCE from courses on the biological dimensions of Global Health: HAJ453H1/HMB323H1/HMB342H1/HMB433H1/HMB436H1/HMB437H1/HMB440H1/HMB443H1/HMB462H1/HMB473H1/HMB474H1/HMB490Y1/HMB496Y1/HMB499Y1

11. 0.5 FCE from courses on the social and ecological dimensions of Global Health: HMB303H1/HMB306H1/HMB406H1/ANT345H1/ANT348H1/ANT358H1/ANT458H1/ANT460H1/BIO220H1/EEB428H1/ENV341H1/ENV430H1/ENV432H1/GGR433H1/GGR434H1/JEH455H1/ECO314H1/HST410H/HST440H/HST464H/HST240Y1/INS250H1/INS350H1/INS355H1/JNH350H1/NEW352H1/NEW353H1/NEW453H1/NFS490H1/PHS300H1/PSY320H1/PSY321H1/ECO324H1/ECO333H1/ECO334H1/ECO342H1/ECO369H1/ECO402H1

Data Analysis Courses

12. 0.5 FCE in statistics: EEB225H1 HMB325H1/STA220H1/STA288H1/PSY201H1

* A research project from a different unit may be accepted with prior written approval from Human Biology if the course is not counting toward a different program.

Global Health Major Notes:
1. Courses can only count toward one requirement, even if listed as options to multiple requisites of the program
2. Not all courses listed have priority enrolment for Global Health majors. Students are responsible for checking priority of courses and meeting course prerequisites for courses they wish to take.
3. The Global Health major cannot be paired with any other Human Biology Program managed major program.

Description of Proposed Changes:

- Removed courses: CHM138H1/CHM139H1/ECO369H1/HMB325H1
- Removed HMB499Y1. Added HMB490Y1.
- CSB349H1 was added where PSL350H1/BCH311H1 existed.
- Added EEB225H1 to statistics requirement.

Rationale:

Courses (CHM138H1/CHM139H1/ECO369H1/HMB325H1) aren’t offered or retired. Removed HMB499Y1 because it was never intended that students use two research project towards any of our programs, leftover from when HMB499Y1 was our primary 4th year project, now HMB496Y1 is. Students may also choose to do a community engaged full year course HMB490Y1, that we proposed last year, we are adding it to programs this year.

Our students take any of BCH311H1/CSB349H1/PSL350 (mostly dependent on if they are enrolled in other majors or
Human Biology Program

Currently doing manual substitutions on Degree Explorer. We will use any statistics course, we are normalizing the options across our programs.

**Impact:**
Minor, students will have to ask for fewer exceptions. They won’t see course options that don’t exist.

**Consultation:**
The details of the course changes were reviewed with the Department of Cell and Systems Biology, who were supportive of the addition of CSB349H1.

**Resource Implications:**

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### Health & Disease Major

#### Completion Requirements:

**Required Courses (8.0 FCE, including at least 0.5 FCE at the 400-level)**

**Chemical and Physical Foundations of Biological Systems**

1.  (CHM135H1, CHM136H1)/CHM138H1, CHM139H1)/CHM151Y1
   *Transfer credits will be accepted in lieu of the chemistry requirements only if they carry a direct exclusion or equivalency to a pre-approved chemistry course*
2.  MAT135H1/PHY131H1/PHY151H1
3.  BCH210H1

**Biological Foundations of Living Systems**

4.  BIO120H1, BIO130H1
5.  BIO220H1, BIO230H1/BIO255H1
6.  HMB265H1/BIO260H1
7.  PSL300H1, PSL301H1

**Health & Disease Concentration Courses**

8.  HMB202H1
9.  HMB302H1/HMB322H1
10. 0.5 FCE from: HAJ453H1/HMB401H1/HMB402H1/HMB422H1/HMB432H1/HMB434H1/HMB436H1/HMB437H1/HMB440H1/HMB441H1/HMB443H1/HMB452H1/HMB462H1/HMB470H1/HMB471H1/HMB472H1/HMB473H1/HMB474H1/EHI352H1/JEH455H1/ANA300Y1/ANA301H1/BCH311H1/CSB345H1/EEB325H1/LMP301H1/LMP363H1/LMP403H1/LMP406H1/NFS485H1/NFS486H1/PCL362H1/PSL350H1/PSL404H1/PSL421H1/PSL425H1

**Data Analysis and Courses in Advanced Research, Laboratory, or Cellular Molecular Topics**

11. 0.5 FCE in statistics: EEB225H1 HMB325H1/STA220H1/STA288H1/PSY201H1
12. 0.5 FCE from an upper-year lab or research-based course: HMB312H1/HMB314H1/HMB323H1/HMB342H1/HST373H1/HMB490Y1/HMB496Y1/HMB499Y1/*BCH311H1/CSB349H1/PSL350H1
*A research project from a different unit may be accepted with prior written approval from Human Biology if the course is not counting toward a different program.

Health & Disease Major Notes:

1. Courses can only count toward one requirement, even if listed as options to multiple requisites of the program.
2. Not all courses listed have priority enrolment for Health & Disease majors. Students are responsible for checking priority of courses and meeting course prerequisites for courses they wish to take.
3. The Health & Disease major cannot be paired with any other Human Biology Program managed major program.

Description of Proposed Changes:

- Removed courses: CHM138H1/CHM139H1/HMB325H1
- Removed HMB499Y1. Added HMB490Y1.
- CSB349H1 was added where PSL350H1/BCH311H1 existed.
- Added EEB225H1 to statistics requirement.

Rationale:

Courses (CHM138H1/CHM139H1/HMB325H1) aren't offered or retired. Removed HMB499Y1 because it was never intended that students use two research project towards any of our programs, leftover from when HMB499Y1 was our primary 4th year project, now HMB496Y1 is. Students may also choose to do a community engaged full year course HMB490Y1, that we proposed last year, we are adding it to programs this year.

Our students take any of BCH311H1/CSB349H1/PSL350 (mostly dependent on if they are enrolled in other majors or minors.) Currently doing manual substitutions on Degree Explorer.

We will use any statistics course, we are normalizing the options across our programs.

Impact:

Minor, students will have to ask for fewer exceptions. They won't see course options that don't exist.

Consultation:

The details of the course changes were reviewed with the Department of Cell and Systems Biology, who were supportive of the addition of CSB349H1.

Resource Implications:

Health & Disease Specialist

Completion Requirements:

Required Courses (13.0 FCE, including at least 1.0 FCE at the 400-level)

Chemical and Physical Foundations of Biological Systems

1. (CHM135H1, CHM136H1) / (CHM138H1, CHM139H1) / CHM151Y1
   Transfer credits will be accepted in lieu of the chemistry requirements only if they carry a direct exclusion or equivalency to a pre-approved chemistry course
2. MAT135H1/PHY131H1/PHY151H1
3. BCH210H1

Biological Foundations of Living Systems

4. BIO120H1, BIO130H1
5. BIO220H1
6. BIO230H1/BIO255H1
7. HMB265H1/BIO260H1
8. PSL300H1, PSL301H1
9. 1.0 FCE from depth courses on the molecular biology of cells and tissues: CSB327H1/CSB328H1/CSB331H1, (BCH311H1/CSB349H1/PSL350H1)

**Health & Disease Concentration Courses**

10. HMB202H1
11. HMB302H1
12. HMB322H1
13. 2.0 FCE from: HAJ453H1/HMB401H1/HMB402H1/HMB422H1/HMB432H1/HMB434H1/HMB436H1/HMB437H1/HMB440H1/HMB441H1/HMB443H1/HMB452H1/HMB462H1/HMB470H1/HMB471H1/HMB472H1/HMB473H1/HMB474H1/JEH455H1/ANA300Y1/ANA301H1/CSB345H1/CSB351Y1/EEB325H1/IMM340H1/IMM350H1/LMP301H1/LMP365H1/LMP403H1/LMP406H1/PSL404H1/PSL421H1/PCL362H1/PSL425H1

**Data Analysis and Research-Based Courses**

14. 0.5 FCE in statistics: EEB225H1 HMB325H1/STA220H1/STA288H1/PSY201H1
15. 0.5 FCE in bioethics: HMB306H1/HMB406H1/PSL390H1/HPL281H1
16. 0.5 FCE from upper-year lab course: HMB312H1/HMB314H1/CSB330H1/PSL372H1/BCH370H1
17. 0.5 FCE from research based courses: HMB323H1/HMB342H1/HST373H1
18. 1.0 FCE from HMB490Y1 HMB496Y1 */HMB496Y1 HMB499Y1*

*A research project from a different unit may be accepted with prior written approval from Human Biology if the course is not counting toward a different program.

**Health & Disease Specialists Notes:**
1. Courses can only count toward one requirement, even if listed as options to multiple requisites of the program
2. Not all courses listed have priority enrolment for Health & Disease specialists. Students are responsible for checking priority of courses and meeting course prerequisites for courses they wish to take.

**Description of Proposed Changes:**
- Removed courses: CHM138H1/CHM139H1/HMB325H1
- Removed HMB499Y1. Added HMB490Y1.
- Added EEB225H1 to statistics requirement.

**Rationale:**
Courses (CHM138H1/CHM139H1/HMB325H1) aren't offered or retired. Removed HMB499Y1 because it was never intended that students use two research project towards any of our programs, leftover from when HMB499Y1 was our primary 4th year project, now HMB496Y1 is. Students may also choose to do a community engaged full year course HMB490Y1, that we proposed last year, we are adding it to programs this year. We will use any statistics course, we are normalizing the options across our programs.

**Impact:**
Minor, students will have to ask for fewer exceptions. They won't see course options that don't exist.

**Consultation:**
The details of the course changes were reviewed with the Department of Cell and Systems Biology, who were supportive of the addition of CSB349H1.

**Resource Implications:**
Human Biology Program

Human Biology Major

Completion Requirements:

Required Courses (8.0 FCE, including at least 0.5 FCE at the 400-level)

Chemical and Physical Foundations of Biological Systems

1. (CHM135H1, CHM136H1)/(CHM138H1, CHM139H1)/CHM151Y1
   Transfer credits will be accepted in lieu of the chemistry requirements only if they carry a direct exclusion or equivalency to a pre-approved chemistry course

2. MAT135H1/PHY131H1/PHY151H1
3. BCH210H1

Biological Foundations of Living Systems

4. BIO120H1, BIO130H1
5. HMB204H1
6. BIO230H1/BIO255H1, BIO220H1
7. HMB265H1/BIO260H1
8. PSL300H1, PSL301H1

9. 1.0 FCE from: HMB302H1/ANA300Y1/ANA301H1/BCH311H1/CSB349H1/CSB351Y1/IMM340H1/IMM350H1/MGY377H1/MGY378H1/PSL350H1


* A research project from a different unit may be accepted with prior written approval from Human Biology if the course is not counting toward a different program.

Human Biology Major Notes:
1. Courses can only count toward one requirement, even if listed as options to multiple requisites of the program.
2. Not all courses listed have priority enrolment for Human Biology majors. Students are responsible for checking priority of courses and meeting course prerequisites for courses they wish to take.
3. The Human Biology major cannot be paired with any other Human Biology Program managed major program.

Description of Proposed Changes:
- Removed CHM138H1 and CHM139H1.
- Added CSB349H1.
- Corrected PSY369H1.
- Deleted HMB499Y1, added HMB490H1.

Rationale:
Human Biology Program

Courses (CHM138H1/CHM139H1) aren't offered or retired.
Removed HMB499Y1 because it was never intended that students use two research project towards any of our programs, leftover from when HMB499Y1 was our primary 4th year project, now HMB496Y1 is. Students may also choose to do a community engaged full year course HMB490Y1, that we proposed last year, we are adding it to programs this year.
Our students take any of BCH311H1/CSB349H1/PSL350 (mostly dependent on if they are enrolled in other majors or minors.) Currently doing manual substitutions on Degree Explorer.
PSY399H1 was renamed PSY369H1.

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<td>Minor, students will have to ask for fewer exceptions. They won't see course options that don't exist.</td>
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<th>Consultation:</th>
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<td>The details of the course changes were reviewed with the Department of Cell and Systems Biology, who were supportive of the addition of CSB349H1.</td>
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<th>Resource Implications:</th>
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2 Minor Program Modifications:

**Immunology Major**

**Completion Requirements:**

(8 full courses or their equivalents, including two 400-series courses)

First Year:
BIO120H1; BIO130H1; [CHM135H1 (formerly CHM139H1); CHM136H1 (formerly CHM138H1)]/CHM151Y1

Second Year:
1. BCH210H1; BIO230H1; IMM250H1; BIO260H1/HMB265H1
2. 0.5 full-course equivalent (0.5 FCE) from the following list: BIO220H1/STA288H1 STA220H1/TRN225Y1/TRN236H1/CHM247H1/CHM249H1

Third Year:
IMM340H1; IMM350H1; CSB349H1/BCH311H1; One full-course equivalent from the following list: BCH370H1/MGY377H1/MGY378H1/PHL281H1

Fourth Year:
One full-course equivalent from the following list: IMM428H1/IMM429H1/IMM430H1/IMM431H1/IMM435H1/MIJ485H1

Notes:

1. Students considering graduate school are encouraged to add the additional non-compulsory IMM450Y1 research course, if space permits.
2. MIJ485H1 requires MGY377H1 & MGY378H1 as pre-requisites.
3. IMM435H1 is capped at 40 students. Priority will be given to Immunology Specialist students, followed by Immunology Major students.

**Description of Proposed Changes:**

**Rationale:**

**Impact:**

**Consultation:**

**Resource Implications:**

**Immunology Specialist**

**Completion Requirements:**

(13.5 full courses or their equivalents)

First Year:
Immunology (MED), Department of

BIO120H1; BIO130H1; [CHM135H1 (formerly CHM139H1); CHM136H1 (formerly CHM138H1)]/CHM151Y1; (MAT135H1; MAT136H1)/MAT137Y1

First Year or upper years:
(PHY131H1; PHY132H1)/(PHY151H1; PHY152H1)

Second Year:
1. BCH242Y1; BIO230H1; BIO260H1/HMB265H1; CHM220H1; IMM250H1
2. One course from the following list: BIO220H1/STA288H1 STA220H1/TRN225Y1/TRN236H1/CHM247H1/CHM249H1

Third Year:
BCH377H1; IMM341H1; IMM351H1; MGY311Y1; MGY377H1; MGY378H1

Fourth Year:
1. IMM435H1
2. Two courses from the following list: IMM428H1/IMM429H1/IMM430H1/IMM431H1/MIJ485H1
3. IMM450Y1 or one full course equivalent at the 400-series in ANA, BCH, IMM, LMP, MGY, CSB.

Notes:
1. (PHY131H1; PHY132H1)/(PHY151H1; PHY152H1) may be taken in the first year or subsequent years and are not required for entrance into the specialist program.
2. IMM435H1 is capped at 40 students. Priority will be given to Immunology Specialist students, followed by Immunology Major students.
3. Students considering graduate school are encouraged to take IMM360H1, if space permits.

Description of Proposed Changes:

Rationale:

Impact:

Consultation:

Resource Implications:

2 New Courses:

IMM199H1: Immunology in the News Today

Contact Hours:

Seminar: 24

Description:

Why do we get sick? How do vaccines work? Does our diet influence our immunity? This course is intended to inspire curiosity about questions generated by immunology concepts that are prevalent in the news today. Different topics will be explored each week including immunity worldwide, human vaccinations and the mucosal immune system. Topics will be placed in context through real-life case studies, immunology virtual laboratory simulation, interactions with
faculty members and extensive coverage of the basic science underlying each topic. Restricted to first-year students. Not eligible for CR/NCR option.

Prerequisites:

Corequisites:

Exclusions:

Recommended Preparation:

Methods of Assessment:

Attendance/Participation (15%)
Class attendance is mandatory and an integral part of your learning experience in this course. Students are expected not only to attend class but also to read the required text before class. Students will have a number of opportunities to participate in the course, including discussion boards on Quercus, weekly online reflection surveys and in-class discussions.

Abstract Submissions (10%)
Students will compose “Annotated Abstracts,” which must be between 300-400 words. Students will use precise language to describe the immune response at play in a specific news-related article (e.g. immune concept at play, detailed markers on a cell, specific receptors, cytokines, protein structure, etc.). Students will gain a profound understanding of the language of immunology and an appreciation for the immunological principles underlying stories in the news.

An annotated bibliography must follow and all written work must be referenced in a consistent format of your choice. For the annotations, each reference entry should be followed by your own description in a few sentences that clearly indicate the main point that links the use of the reference to your abstract text statements.

Format: A title for the abstract, name and student number must be included. 2-cm margins, single spaced, 12 pt Times New Roman font.

Further details on topics and a grading rubric will be provided later. Each abstract submission is worth 5%. Abstract due dates are Week 3 and Week 7 of the course.

Group Written Assignment (25%)
Upon exposure to stories in the news, an understanding of immunological principles is key to discerning “myth” from “fact.” Therefore, in IMM199H1, you will have the opportunity to engage in a collaborative written assignment with a group of 4-5 students. 20% of your grade for this assignment will be derived from the written group submission, and 5% from peer evaluation of your contribution to the group assignment.

There will be two opportunities for your group to meet with one Department of Immunology faculty member for one hour for suggestions and feedback on your approach to the project (Weeks 5 and 10*). The Group Project Write-up for each group must be no longer than five pages (excluding figures/annotated bibliography), single-spaced (2-cm margins) and use 12pt Times New Roman Font. Please ensure it includes the following criteria:
Choosing a topic: While not an explicit criterion, consider which topics are gaining traction in the media (consult credible news sources). Ensure that you can match your topic of interest with a departmental faculty member. You will be responsible for posting your topic and chosen faculty member on the Quercus discussion board during Week 3 of the course. Topic/faculty member selections will happen on a first-come first-serve basis, no duplicates will be allowed.

[Assignment Guidelines + Rubric - Need Development]
An informative title and the names and student numbers of all group members.
Immunology (MED), Department of

Introduction

350 word rationale/summary of the news article you have selected in your own words.
Using the scientific literature (up to 2-3 primary research articles and 1 review article), identify why this topic is important.

Body

Explain the immunological concepts underlying this topic. Figures & accompanying figure captions can be included – these can be embedded within the text or included at the end. Figures/pictures/diagrams must be properly cited if they are not your own.

Which aspects of the article were accurate/inaccurate? Which details were lacking?

Social Perception

Annotated Biliography

After the text, please include an annotated bibliography. For the annotations, each reference entry should be followed by your own description in a few sentences that clearly indicate the main point that links the use of the reference to your text statements.

Due date: (Week 12)

Midterm/Final Exam

The questions used in the midterm (Week 6) and final exam will reflect course topics, interactive learning exercises and videos throughout the course. The final exam will only cover the new material preceding the exam (i.e. non-cumulative). Exams will be in both multiple choice and short answer formats. The final exam will be 2-hours in duration and will be scheduled by the Faculty of Arts & Science during the examination period. Information in coverage, along with some sample questions will be posted on Quercus in advance.

Breadth Requirements:

Living Things and Their Environment (4)

Distribution Requirements:

Science

Competencies:

Communication: extensively; Critical and Creative Thinking: notably; Information Literacy: extensively
Quantitative Reasoning: none; Social and Ethical Responsibility: extensively

Experiential Learning:

Research: none; Other: none

Rationale:

This course is a first year foundations (FYF) course that will provide students with an opportunity to exchange points of view with their peers and faculty members to tackle controversial topics in Immunology. Students will also get a glimpse into our Immunology Major/Specialist programs in a small-classroom setting that will promote their abilities to think critically, and express their ideas through class discussions and in their writing. Importantly, this course will be the first 100-level, FYF course in our portfolio, and given the timely relevance of the various topics covered, will likely attract students interested in both scientific/non-scientific disciplines.

Consultation:

1. Department of Immunology faculty consultation.
2. Consultation with the Director of the Human Biology Program (Ashley Bruce; August 15, 2019) and Special Adviser to the Dean of Medicine on Undergraduate Education (Michelle French; August 20, 2019).
3. Consultation with the Basic Sciences Associate Chairs (September 20, 2019): The Committee discussed and approved the proposal.
4. Consultation with the Trinity College Arts and Science Committee (September 26, 2019): The Committee approved this proposal. The Trinity College Senate approved the proposal on October 7th.

Resources:

Classroom with teaching station.

Budget Implications: The academic unit will provide the resources required for this course from existing budget.
Overlap with Existing Courses:
To the best of our knowledge, the following Arts and Science Units do not offer courses with overlapping content: Laboratory Medicine and Pathology, Molecular Genetics, Biochemistry, Nutritional Sciences, Cell and Systems Biology, Physiology, Biology, Human Biology.

Programs of Study for Which This Course Might be Suitable:

Estimated Enrolment:
25

Instructor:
Jastaran Singh

IMM360H1: Scientific Methods and Research in Immunology

Impact on Programs:
This proposal triggers modifications in the unit's program(s)

Contact Hours:
Lecture: 24 / Tutorial: 24

Description:
This course will provide students with an opportunity to advance their understanding of research in Immunology in accordance with scientific methodology. Students will critically appraise scientific articles, design and analyze scientific experiments, and develop the core skills of data and statistical literacy. This course is well suited for anyone interested in discovering knowledge in Immunology, providing students with a methodology for the achievement of scientific research activities.

Prerequisites:
IMM250H1, BCH210H1/BCH242Y1, BIO230H1/BIO255H1, BIO260H1/HMB265H1

Corequisites:

Exclusions:

Recommended Preparation:
STA288H1

Methods of Assessment:
Attendance/Participation (10%)
Class attendance is mandatory and an integral part of your learning experience in this course. Students are expected not only to attend class but also to read the required text before class to engage in the material during class discussions and through the discussion board on Quercus.

Assignment 1: Article Critique (20%)
[Engaging with research – theme 1]
You will select an article of your choice. Your critique of this article should communicate your understanding of an article’s main points in the form of a brief literature review, while offering an analysis of its strengths and weaknesses. You will be responsible for generating a preliminary outline of your ideas for peer review in tutorial during Week 4.

Based on your analysis, you will identify a unique research question within the field and formulate a hypothesis that will be used for the basis of your final oral presentation. Focus should be placed on critical analysis and concision.

Due Date: Week 5
Assignment 2A-C: Data Analysis Assignments (3x5% = 15%)
[Working with immunological data – theme 2]
You will receive different types of immunological data each week for weeks 6-8 of the course (flow cytometry, immunofluorescence/ELISA cytokines?, RNASeq) and the associated publication (where applicable). Your goal will be to deduce which type of variables you are analyzing, generate brief data summaries in R (with associated R packages), and perform corresponding descriptive/inferential statistics in the form of a figure + caption.

*Tutorials for weeks 6-8 will provide students with an opportunity to seek extra help for these assignments from instructors and teaching assistants.

Assignment 3: Group Presentation – Research Study (20%)
[Designing a research study – theme 3]
Students will work in groups of 4-5 and select a single research question/hypothesis from Assignment 1. Students will propose 2-3 experiments to address their research question, with careful integration of study rationale, the principles of experimental design and statistical methods. Oral presentations will be 6-8 minutes with a 2-minute question period.

Final Exam (35%)
The final exam will be application-based. Students will be provided with experimental data and/or figures and be asked to critically analyze and propose strategies for data presentation.

Breadth Requirements:
Living Things and Their Environment (4)

Distribution Requirements:
Science

Competencies:
Communication: extensively; Critical and Creative Thinking: notably; Information Literacy: extensively
Quantitative Reasoning: extensively; Social and Ethical Responsibility: none

Experiential Learning:
Research: notably; Other: none

Rationale:
This course will educate students on relevant and transferable skills surrounding scientific methodologies and data literacy. It will fill notable gaps in our Immunology Specialist and Major Programs, and address our departmental strategic goals, which are aimed at better preparing students for scientific careers in research and beyond. Furthermore, specialized undergraduate courses on the research data/methodology are rare within the University at large; thus, this course will likely attract students aiming to pursue independent research projects or graduate studies in Immunology and other scientific disciplines.

Consultation:
1. Department of Immunology faculty consultation.
2. Department of Immunology External Review (2016), which included a consultation with Undergraduate Students.
3. Consultation with the Director of the Human Biology Program (Ashley Bruce; August 15, 2019) and Special Adviser to the Dean of Medicine on Undergraduate Education (Michelle French, August 20, 2019).
4. Consultation with the Life Sciences Planning Committee (September 20, 2019): The Committee discussed and approved the proposal.
5. Consultation with the Trinity College Arts and Science Committee (September 26, 2019). The Committee approved this proposal. The Trinity College Senate approved this proposal on October 7, 2019.

Resources:
Classroom with teaching station.
Computing Resources
Budget Implications: The academic unit will provide the resources required for this course from existing budget.

Overlap with Existing Courses:
To the best of our knowledge, the following Arts and Science Units do not offer courses with overlapping content: Laboratory Medicine and Pathology, Molecular Genetics, Biochemistry, Nutritional Sciences, Cell and Systems
Immunology (MED), Department of Biology, Physiology, Biology, Human Biology.

HMB496Y1 and HMB499Y1 contain a 1.5h statistics workshop during which a faculty member from the Department of Statistical Sciences provides a guest lecture to introduce students to the field of statistics in the context of their independent research projects. Upon discussions with the Director and Undergraduate Coordinator of the Human Biology Program (Dr. Ashley Bruce; August 15, 2019), we estimate the overlap to be negligible, as our proposed course will delve further into the statistical sciences with direct application to datasets derived from the field of Immunology.

JPM300H1 also aims to teach students how to critically evaluate scientific evidence and effectively communicate to a wide audience. Consultations with key faculty members involved in conception, initiation and design of this course indicate that the overlap will be minimal. JPM300H1 will place focus on commercialization and job-readiness skills for undergraduate students, whereas our proposed course will be focused directly on academic application of data/statistical literacy skills. We estimate the overlap to be less than 10%, and anticipate that the two courses will complement one another to ensure that students are career-ready for diverse settings both within and outside of academic research settings.

No other potential overlap was raised upon consultation with the Life Sciences Planning Committee, and the Trinity College Arts and Science Committee.

**Programs of Study for Which This Course Might be Suitable:**

We will initially offer this course for:
- Immunology Specialist (ASSPE1002)
- Immunology Major (ASMAJ1002)

We will subsequently expand our course offering for the following programs of study:
- Fundamental Genetics and its Applications Specialist (ASSPE1050)
- Molecular Genetics and Microbiology Specialist (ASSPE1387)
- Neuroscience Specialist (ASSPE1472)
- Biochemistry Specialist (ASSPE1762)
- Health & Disease Specialist (ASSPE2013)
- Pathobiology Specialist (ASSPE2025)
- Biology Specialist (ASSPE2364)

**Estimated Enrolment:**

40

**Instructor:**

Jastaran Singh
1 Course Modification:

**PHY492H1: Advanced Atmospheric Physics**

**Prerequisites:**
PHY250H1, MAT235Y1/MAT237Y1/MAT257Y1

**Rationale:**
MAT235Y1 has been added as one of the allowable second-year MAT prerequisites. I believe its absence was an oversight rather than intentional. This was at the request of the instructor who is a past Physics Associate Chair for undergraduate studies.

**Consultation:**
Approved by the Physics Dept. undergraduate curriculum committee.

**Resources:**

4 Retired Courses:

**PHY101H1: Emergence in Nature**

**Rationale:**
Course was last taught in fall 2013. It no longer appears on Physics Dept. web pages. A course with the same title and course description is now offered as a FYF course, PHY196H1.

**Consultation:**
Retention has been approved by the Physics Dept. Undergraduate Curriculum committee, and discussed with Kevin Mak.

**PHY201H1: Concepts of Physics**

**Rationale:**
Course was last taught in fall 2012. There is no longer any Dept. web page for it.

**Consultation:**
Approved by Dept. of Physics undergraduate curriculum committee and discussed with Kevin Mak.

**PHY289H1: Physics at the Cutting Edge**

**Rationale:**
Replaced by FYF course PHY198H1 with the same title.

**Consultation:**
Approved by Dept. of Physics undergraduate curriculum committee and discussed with Kevin Mak.

**PHY494H1: Geophysical Imaging: EM and Potential Fields**

**Rationale:**

**Consultation:**
Approved by Physics Dept. undergraduate curriculum committee and discussed with Kevin Mak.
4 Minor Program Modifications:

Specialist in Statistical Science: Methods and Practice

Enrolment Requirements:

This is a limited enrolment program that can only accommodate a certain number of students. Eligibility is based on the following:

For students entering the program after first year:

A. Completion of at least 4.0 FCEs including:

- STA130H1
- CSC108H1/CSC120H1/CSC121H1/CSC148H1
- MAT223H1/MAT240H1
- (MAT135H1, MAT136H1) with a minimum grade of 75% in both courses or MAT137Y1 with a minimum grade of 65% or MAT157Y1 with a minimum grade of 65%

AND

B. The average of the grades in STA130H1 and (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1. Note that students who take (MAT135H1, MAT136H1) will typically require a higher average grade in these courses than students who take MAT137Y1/MAT157Y1.

For students entering the program after 2nd year:

A. Completion of:

- CSC108H1/CSC120H1/CSC121H1/CSC148H1,
- MAT223H1/MAT240H1,
- MAT235Y1/MAT237Y1/MAT257Y1,
- (STA237H1, STA238H1) with a minimum grade of 75% in both courses or (STA247H1, STA248H1) with a minimum grade of 75% in both courses or (STA257H1, STA261H1) with a minimum grade of 65% in both courses.

AND

B. The average of the grades in (STA237H1, STA238H1)/(STA247H1, STA248H1)/(STA257H1, STA261H1)/ECO227Y1 and MAT235Y1/MAT237Y1/MAT257Y1. Note that students who take (STA237H1, STA238H1)/ECO227Y1 and (STA247H1, STA248H1) will typically require a higher average grade in these courses than students who took (STA257H1, STA261H1)/ECO227Y1.

It is difficult to predict the minimum average required for admission in any given year. More information will be posted on the department website as it becomes available.

Completion Requirements:

(10 or 10.5 FCEs plus a disciplinary focus requiring 2.0-3.5 FCEs)
First year:
1. STA130H1, CSC108H1/CSC120H1/CSC121H1/CSC148H1, (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1. (MAT137Y1/MAT157Y1 recommended)

2. Recommended: introductory course in disciplinary focus. MAT223H1/MAT240H1 is also strongly recommended to be taken in first year and is required preparation for MAT237Y1.

Second year:
3. MAT223H1/MAT240H1, MAT235Y1/MAT237Y1/MAT257Y1, (STA237H1, STA238H1)/(STA247H1, STA248H1)/ (STA257H1, STA261H1) 
((STA257H1, STA261H1) recommended)

Upper years:
4. STA302H1, STA303H1, STA304H1/STA305H1, STA314H1/STA365H1, STA355H1

5. 1.5 FCE from the following list: STA414H1, STA437H1, STA442H1, STA457H1, STA465H1, STA480H1, STA410H1

6. STA490Y1 or successful completion of an internship (see department for information about internships)

7. 1.0 FCE from the following list: MAT224H1/MAT247H1, MAT337H1/MAT357H1, CSC148H1, CSC207H1, STA300+ level courses (excluding STA310H5)

**Disciplinary Focuses**

Students in the Specialist Program in Statistical Science: Methods and Practice program must complete at least one disciplinary focus.

To enrol in one or more focuses, students must first be enrolled in the Specialist Program in Statistical Science: Methods and Practice program. Enrolment instructions can be found on the Arts & Science Program Toolkit website. Focuses can be chosen on ACORN after admission to the program, which begins in July.

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**Health Studies:** (2.0 FCE) HMB342H1 HST373H1, at least 0.5 FCE from HST209H1/HST211H1/HST250H1; HST308H1/HST310H1/HST405H1/HST330H1/HST440H1 HST411H1/HST464H1

**Global Health:** (3.0 FCE) BIO120H1, BIO130H1, HMB203H1, HMB265H1 HMB324H1, HMB322H1/HMB303H1/ HMB360H1/HMB342H1, HMB242H1/HMB342H1, HMB433H1/HMB406H1/HMB462H1/HMB434H1 (Recommended: HMB433H1)

**Health and Disease:** (3.0 FCE) BIO120H1, BIO130H1, HMB202H1, HMB265H1, HMB302H1; HMB321H1/HMB322H1/ HMB312H1/HMB342H1, HMB422H1/HMB402H1/HMB432H1/HMB434H1/HMB435H1/HMB436H1/HMB437H1/ HMB452H1/HMB462H1

**Fundamental Genetics and its Applications:** (3.0 FCE) BIO120H1, BIO130H1, HMB201H1, HMB265H1, HMB301H1/ HMB311H1; HMB321H1/HMB360H1, HMB421H1/HMB441H1/HMB401H1/HMB431H1 (Recommended: HMB421H1)

**Neuroscience:** (3.0 FCE) BIO120H1, BIO130H1; PSY100H1, HMB200H1/HMB220H1, HMB265H1, HMB300H1/ HMB310H1/HMB320H1/HMB360H1/CJH332H1, HMB420H1/JHA410H1/HMB430H1/HMB450H1 (Recommended: HMB420H1)
Statistical Sciences (FAS), Department of

Social Psychology: (2.0 FCE) PSY100H1, PSY220H1, PSY322H1, PSY326H1/PSY321H1/PSY424H1/PSY426H1/PSY405H1/PSY406H1

Cognitive Psychology: (2.0 FCE) PSY100H1, PSY270H1, PSY493H1, PSY372H1/PSY405H1/PSY406H1/PSY475H1

Sociolinguistics: (3.0 FCE) LIN100Y1; 2 of LIN228H1, LIN229H1, LIN232H1 or LIN241H1; LIN351H1 and LIN456H1

Psycholinguistics: (3.0 FCE) LIN100Y1; 2 of LIN228H1, LIN229H1, LIN232H1 or LIN241H1; 2 of JLP374H1, JLP315H1 or JLP471H1

Astronomy & Astrophysics: (2.5 or 3.0 FCE) (PHY131H1, PHY132H1)/(PHY151H1, PHY152H1); AST221H1, AST222H1; (PHY252H1, AST320H1)/AST325H1/AST326Y1

Sociology: (2.5 FCE) SOC100H1+SOC150H1 (minimum combined average grade of 65%); SOC204H1; 1.0 FCE from SOC303H1, SOC312H1, SOC336H1, SOC355H1, SOC363H1, SOC364H1.

Students interested in advanced study in Sociology should consider additional courses, in particular SOC201H1, SOC251H1, and SOC254H1

Ecology: (3.0 FCE) BIO120H1, BIO220H1; 2.0 FCE from (with at least 0.5 FCE at the 400 level) EEB319H1/EEB321H1/EEB328H1/EEB365H1/EEB428H1/EEB433H1/EEB440H1 or ENV234H1/ENV334H1/ENV432H1

Evolutionary Biology: (3.5 FCE) BIO120H1, BIO130H1, BIO220H1; 1.5 FCE from HMB265H1/BIO260H1, EEB318H1, EEB323H1, EEB324H1, EEB325H1, EEB362H1, EHB352H1; 0.5 FCE from EEB440H1, EEB455H1, EEB459H1, EEB460H1

Notes:

- BIO260H1 requires BIO230H1 as a prerequisite.
- Students in the Focus in Evolutionary Biology can request that HMB waive the co-requisite of BIO230H1 for HMB265H1 and that EEB waive the prerequisite of BIO230H1 for EEB460H1. These waivers will only be considered for students in the Applied Statistics specialist focus in Evolutionary Biology. All other pre- and co-requisites are required.

Economics: (3.5 FCE) (ECO101H1, ECO102H1), ECO200Y1/ECO206Y1, ECO202Y1/ECO208Y1, 0.5 FCE 300+ series ECO course with the exception of ECO374H1 and ECO375H1

Biochemistry: (3.0 FCE)  
CHM135H1, CHM136H1, BCH210H1, BCH311H1, BCH370H1, BCH441H1

Physics: (2.5 FCE)  
PHY131H1/PHY151H1, PHY132H1/PHY152H1, PHY224H1, PHY252H1/PHY254H1/PHY256H1, PHY324H1

Pharmacology and Biomedical Toxicology: (3.0 FCE)  
BIO130H1 (minimum grade of 70%); PSL300H1, PSL301H1, PCL201H1, PCL302H1, PCL345H1/PCL362H1/PCL469H1/PCL470H1

Description of Proposed Changes:

Update course options to offer students more flexibility in their course choices to help them progress through their focus, and require the same number of credits for all HMB focus programs for consistency.

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Update course options to offer students more flexibility in their course choices to help them progress through their focus, and require the same number of credits for all HMB focus programs for consistency.

Update course options to reflect current offerings and offer students more flexibility in their course choices to help them progress through their focus.

Wording change to enrollment requirements based on first and second year courses. Current wording is ambiguous.

Remove mention of ECO227H1 in 2nd year program entrance procedure description for ASSPE2270.

Remove CSC121H1 from enrolment requirements & completion requirements

Rationale:
These revisions will provide more accessible options and flexible paths for students to complete their focus. In the interest of consistency, require the same number of credits for all HMB focus programs.

These revisions will provide more accessible and flexible paths for students to complete this focus.

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These revisions will provide more accessible and flexible paths for students to complete this focus and, in the interest of consistency, require the same number of credits for all HMB focus programs.

Students experienced challenges accessing the courses they needed to complete the Health Studies focus this year. These revisions will better reflect current Health Studies course offerings and provide more options for students to complete this focus.

This year students raised questions about whether the minimum grade requirement on a pair of half courses were based on the average of the two, or for both courses.

ECO227H1 satisfies the second-year STA course requirement for students in the Statistics Major, and an Economics program, so it is considered for admission into the Statistics Major program. However, it is not used as entrance criteria, nor does it satisfy the program requirements for the Statistics Specialist programs. To avoid confusion and to be consistent with program enrolment processes, mention of ECO227H1 needs to be removed from the description of the entrance procedure for students requesting the program after 2nd year.

Computer Science is no longer offering the course.

Impact:
This will facilitate Global Health focus completion for students in ASPE2270.

This will facilitate Health and Disease focus completion for students in ASPE2270.

This will facilitate Fundamental Genetics and its Applications focus completion for students in ASPE2270.

This will facilitate Neuroscience focus completion for students in ASPE2270.

This will facilitate Health Studies focus completion for students in ASPE2270.

This change will clarify admission requirements so as to reduce student confusion.

Program enrolment procedures for ASSPE2270 will be clarified in the calendar.

Update requirements in calendar to align with courses offered.
Consultation:  
These changes have been discussed and agreed on by the Human Biology Program and Statistics.

Computer Science notified us that this course is no longer being offered.

Resource Implications:

Specialist in Statistical Science: Theory and Methods

Enrolment Requirements:

This is a limited enrolment program that can only accommodate a certain number of students. Eligibility is based on the following:

For students entering the program after first year:

1. Completion of at least 4.0 FCEs including:
   - STA130H1,
   - CSC108H1/CSC120H1/CSC121H1/CSC148H1,
   - MAT223H1/MAT240H1,
   - MAT137Y1 with a minimum grade of 65% or MAT157Y1 with a minimum grade of 65%

   AND

2. The average of the grades in STA130H1 and MAT137Y1/MAT157Y1.

For students entering the program after second year:

1. Completion of:
   - CSC108H1/CSC120H1/CSC121H1/CSC148H1,
   - MAT223H1/MAT240H1,
   - MAT237Y1/MAT257Y1,
   - STA257H1 with a minimum grade of 65% and STA261H1 with a minimum grade of 65%

   AND

2. The average of the grades in STA257H1 and STA261H1 and MAT237Y1/MAT257Y1.

It is difficult to predict the minimum average required for admission in any given year. More information will be posted on the department website as it becomes available.

Completion Requirements:

(11 full courses or their equivalent)

First Year:

STA130H1, CSC108H1/CSC120H1/CSC121H1/CSC148H1, MAT137Y1/MAT157Y1, MAT223H1/MAT240H1
Second Year:
MAT224H1/MAT247H1, MAT237Y1/MAT257Y1; STA257H1, STA261H1

Higher Years:
1. STA302H1, STA303H1, STA304H1/STA305H1, STA314H1/STA365H1, STA347H1, STA355H1
2. 1.0 FCE from the following list: STA410H1, STA414H1, STA437H1, STA442H1, STA457H1, STA465H1, STA480H1
3. One of STA447H1, STA452H1, STA453H1
4. 1.0 FCE from: ACT451H1, ACT452H1, ACT460H1, MAT327H1, MAT332H1, MAT334H1/MAT354H1, MAT337H1/MAT357H1, MAT301H1/MAT347Y1, MAT344H1, CSC207H1, CSC336H1, CSC343H1, STA300+-level courses (excluding STA310H5)
5. One of STA492H1, STA496H1/STA497H1/STA498Y1/STA499Y1 or successful completion of an internship (see department for more information about internships)

Note: Students planning to take any of these courses should ensure they have the required prerequisites

**Description of Proposed Changes:**
Removing CSC121H1 as this course is being retired.

**Rationale:**
CSC121H1 will no longer be offered.

**Impact:**

**Consultation:**

**Resource Implications:**

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**Statistics Major**

**Enrolment Requirements:**

*(The following enrolment requirements will be in effect for the 2020 enrolment period.)*

This is a limited enrolment program that can only accommodate a certain number of students. Eligibility is based on the following:

For students entering the program after first year:

A. Completion of at least 4.0 FCEs including:
   - STA130H1,
   - (MAT135H1, MAT136H1) or MAT137Y1 or MAT157Y1
   AND
   - The average of the grades in STA130H1 and (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1. Note that students who take (MAT135H1, MAT136H1) will typically require a higher average grade in these courses than students who take MAT137Y1/MAT157Y1.

For students entering the program after 2nd year:

A. Completion of:
   - CSC108H1/CSC120H1/CSC121H1/CSC148H1,
Statistical Sciences (FAS), Department of

- MAT223H1/MAT240H1,
- MAT235Y1/MAT237Y1/MAT257Y1,
- (STA237H1, STA238H1) or (STA247H1, STA248H1) or (STA257H1, STA261H1) or ECO227Y1

AND

B. The average of the grades in (STA237H1, STA238H1)/(STA247H1, STA248H1)/(STA257H1, STA261H1)/ECO227Y1 and MAT235Y1/MAT237Y1/MAT257Y1. Note that students who take (STA237H1, STA238H1)/(STA257H1, STA261H1)/(STA247H1, STA248H1) will typically require a higher average grade in these courses than students who took (STA257H1, STA261H1)/ECO227Y1.

It is difficult to predict the minimum average required for admission in any given year. More information will be posted on the department website as it becomes available.

Completion Requirements:

(7.0 full courses or their equivalent, including at least one STA 400-series course)

First Year:

STA130H1, CSC108H1/CSC120H1/CSC121H1/CSC148H1, (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1.

(MAT223H1/MAT240H1 recommended in 1st year)

Second Year:

MAT223H1/MAT240H1, MAT235Y1/MAT237Y1/MAT257Y1; (STA247H1, STA248H1)/(STA237H1, STA238H1)/(STA257H1, STA261H1)/ECO227Y1

(STA237H1 and STA238H1 are strongly recommended. MAT221H1 may not be used for this requirement.)

Higher Years:

1. STA302H1
2. 0.5 FCE from STA314H1/STA365H1/STA347H1/STA355H1
3. 0.5 FCE from STA414H1/STA437H1/STA442H1/STA457H1/STA465H1/STA480H1
4. 1.0 FCE from all available STA300+ level courses, excluding STA310H5

Description of Proposed Changes:

Removing CSC121H1 as the course is being retired Fall 2020.

Rationale:

Computer Science is no longer offering the course. Removing CSC121H1 as the course is being retired Fall 2020.

Update requirements in calendar to align with courses offered.

Impact:

Consultation:

Computer Science notified us that this course is no longer being offered.

Resource Implications:

Statistics Minor

Description:

Statistical Science encompasses methods and tools for obtaining knowledge from data and for understanding the
Statistical Sciences (FAS), Department of

uncertainty associated with this knowledge.

The Minor in Statistics is designed to provide students with some exposure and skills in advanced statistical methods. It complements programs in other disciplines which involve quantitative research.

**Completion Requirements:**

(4 full courses or their equivalent)

**First Year:**

MAT133Y1 (70%)/(MAT135H1, MAT136H1)/MAT135Y/MAT137Y1, MAT157Y1, CSC108H1/CSC120H1/CSC121H1/CSC148H1 (MAT135H1, MAT136H1)/MAT137Y1/MAT157Y1 is strongly recommended).

STA130H1 is also strongly recommended.

**Second Year:**

MAT221H1 (70%)/MAT223H1/MAT240H1, (STA220H1/STA221H1/ECO220Y1, STA255H1)/(STA237H1, STA238H1)/(STA247H1, STA248H1)/(STA257H1, STA261H1)/ECO227Y1

MAT221H1 (70%)/MAT223H1/MAT240H1 recommended in 1st year

**Higher Years:**

STA302H1

1 half (H) course equivalent from all available STA300+ level courses (excluding STA310H5)

**Description of Proposed Changes:**

Improve description of this program.

CSC121H1 removed as course is being retired.

**Rationale:**

The Statistics Minor program does not require many STA courses. Although it is an excellent complement to other Programs of Study, it really does not offer breadth, nor depth, in advanced statistical methods. This description should be updated to more accurately describe what the students will gain from the minor.

Computer Science is no longer offering the course. Update requirements in calendar to align with courses offered.

**Impact:**

The calendar will more accurately describe what students will gain with the Statistics minor to inform their program choices.

**Consultation:**

Computer Science notified us that this course is no longer being offered.

**Resource Implications:**

**2 New Courses:**

| 2 New Courses: | 88 |
### STA197H1: Thinking Better with Statistics

**Contact Hours:**  
*Seminar:* 24

**Description:**

This course explores how our statistical intuitions and ways of thinking can let us down. There’s no need to be a math whiz to be a better statistical thinker. Everyone can become a more critical consumer of claims presented in media, advertisements and by politicians—especially those relevant to our own health and wealth. This course uses real-world examples and tours common and avoidable statistical traps and tricks. Restricted to first-year students. Not eligible for CR/NCR option.

**Prerequisites:**

**Corequisites:**

**Exclusions:**

**Recommended Preparation:**

**Methods of Assessment:**

- This course uses real-world examples and tours common and avoidable statistical traps and tricks.

**Breadth Requirements:**

- The Physical and Mathematical Universes (5)

**Distribution Requirements:**

- Science

**Competencies:**

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

**Experiential Learning:**

- *Research:* none; *Other:* none

**Rationale:**

This is a FAS FYF course. The Department of Statistical Sciences already offers two such courses (STA196: Probabilities Everywhere and STA199: Statistical Evidence: Truth or Myth?). We are proposing this one toward the FAS requirement for our department to offer 2.0FCE of FYF courses per year. An Actuarial Science course will be proposed this year as well to meet the department’s full 2.0 FCE requirement.

**Consultation:**

The Statistics Undergraduate Committee was consulted. This is an statistics course, that should not overlap with undergraduate offerings in other units so no other units were consulted.

**Resources:**

- Instructor

**Budget Implications:** The academic unit will provide the resources required for this course from existing budget.

**Overlap with Existing Courses:**

This is a statistical literacy course so it should not overlap with courses offered by other departments/programs.

**Programs of Study for Which This Course Might be Suitable:**
This course will not count toward Statistics programs of study, but may be appropriate to meet breadth requirements for other programs.

**Estimated Enrolment:**

25

**Instructor:**

Dr. Liza Bolton, Assistant Professor, Teaching Stream (start date Jan, 2020)

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**STA475H1: Survival Analysis**

**Contact Hours:**

*Lecture:* 36

**Description:**

An overview of theory and methods in the analysis of survival data. Topics include survival distributions and their applications, parametric and non-parametric methods, proportional hazards regression, and extensions to competing risks and multistate modelling.

**Prerequisites:**

STA303H1

**Corequisites:**

**Exclusions:**

**Recommended Preparation:**

**Topics Covered:**

Topics include survival distributions and their applications, parametric and non-parametric methods, proportional hazards regression, and extensions to competing risks and multistate modelling.

**Breadth Requirements:**

The Physical and Mathematical Universes (5)

**Distribution Requirements:**

**Competencies:**

*Communication:* notably; *Critical and Creative Thinking:* notably; *Information Literacy:* notably
*Quantitative Reasoning:* extensively; *Social and Ethical Responsibility:* notably

**Experiential Learning:**

*Research:* none; *Other:* none

**Rationale:**

There is tremendous enrolment pressure on all our upper-year STA courses with the dramatic increase in Statistics program enrolments. Offering this new specialized course will relieve some pressure on existing courses and offer students another course option so they can better tailor their course selections to their interests.

This course introduces students to an area of statistics which is not covered in existing courses, and aligns with the biostatistics research backgrounds of several of our faculty members. This course supports the program-level learning outcomes of our Statistics Major and Specialist programs; in particular, those related to statistical methods, communication and computation. After completion of this course, students will be able to analyze survival data using...
several classes of statistical methods. They will gain hands-on experience using R to analyze real data and develop their communication skills by interpreting their findings.

**Consultation:**
The Statistics Undergraduate Committee and the Associate Chair, Undergraduate Studies in Actuarial Science were consulted. This is an advanced undergraduate statistics course, that does not overlap with, nor impact, undergraduate offerings in other units so no other units were consulted.

**Resources:**
Instructor and T.A’s

**Budget Implications:** The academic unit will provide the resources required for this course from existing budget.

**Overlap with Existing Courses:**
This is an advanced undergraduate statistics course, that does not overlap with undergraduate courses in other departments/programs.

**Programs of Study for Which This Course Might be Suitable:**
- Specialist in Statistical Science: Methods and Practice (ASSPE2270)
- Specialist in Statistical Science: Theory and Methods (ASSPE2290)
- Statistics Major (ASMAJ2289)
- Statistics Minor (ASMIN2289)
- Statistics Specialist (ASSPE2289)
- Applied Statistics Specialist (ASSPE1540)

**Estimated Enrolment:**
100

**Instructor:**
Dr. Nathalie Moon, Assistant Professor, Teaching Stream

### 11 Course Modifications:

**ACT371H1: Basic Reserving Methods For P&C Insurance**

**Description:**
Topics covered include reserving data and triangles, diagnoses methods that range from triangle of ratios of paid claims to reported claims to triangle of reported claim ratios. The syllabus also includes projection techniques.

**Credit/No Credit Option:**

- **Previous:** Yes
- **New:** No

**Rationale:**
At the end of 2018-2019 academic year, we held a feedback meeting with the instructors for ACT371, ACT372, and ACT471. Those three courses are examples of partnership between our program and the industry; they are "practicum" courses designed and conducted by senior industry professionals (all Fellows of Casualty Actuarial Association). Unanimously, the instructors of those courses requested us to remove the CR/NCR option from those courses. Those courses have a heavy "experiential learning" component, comprised of various real-world projects. Often those are team projects as well. Instructors have found that certain students took advantage of the CR/NCR option and ceased to make an effort in the later projects, leaving their teammates to do all the hard work and ultimately affected those other students' course grades. Moreover, those practicum courses are seen as "windows" for seasoned professionals from the industry to gain a better understanding of our program as well as our students. Incidences like above had damaged the image of our study body in the industry to some extent and we would like to avoid future incidences. Therefore, both to
Statistical Sciences (FAS), Department of

protect our students as well as to uphold the image of our program, we would like to request the removal of CR/NCR options from those courses.

Consultation:

Resources:

**ACT372H1: Basic Ratemaking Methods For P&C Insurance**

<table>
<thead>
<tr>
<th>Credit/No Credit Option:</th>
<th>Previous: Yes</th>
<th>New: No</th>
</tr>
</thead>
</table>

**Rationale:**

At the end of 2018-2019 academic year, we held a feedback meeting with the instructors for ACT371, ACT372, and ACT471. Those three courses are examples of partnership between our program and the industry; they are "practicum" courses designed and conducted by senior industry professionals (all Fellows of Casualty Actuarial Association). Unanimously, the instructors of those courses requested us to remove the CR/NCR option from those courses. Those courses have a heavy "experiential learning" component, comprised of various real-world projects. Often those are team projects as well. Instructors have found that certain students took advantage of the CR/NCR option and ceased to make an effort in the later projects, leaving their teammates to do all the hard work and ultimately affected those other students' course grades. Moreover, those practicum courses are seen as "windows" for seasoned professionals from the industry to gain a better understanding of our program as well as our students. Incidences like above had damaged the image of our study body in the industry to some extent and we would like to avoid future incidences. Therefore, both to protect our students as well as to uphold the image of our program, we would like to request the removal of CR/NCR options from those courses.

Consultation:

Resources:

**ACT471H1: Topics in Casualty Actuarial Science**

<table>
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<tr>
<th>Credit/No Credit Option:</th>
<th>Previous: Yes</th>
<th>New: No</th>
</tr>
</thead>
</table>

**Rationale:**

At the end of 2018-2019 academic year, we held a feedback meeting with the instructors for ACT371, ACT372, and ACT471. Those three courses are examples of partnership between our program and the industry; they are "practicum" courses designed and conducted by senior industry professionals (all Fellows of Casualty Actuarial Association). Unanimously, the instructors of those courses requested us to remove the CR/NCR option from those courses. Those courses have a heavy "experiential learning" component, comprised of various real-world projects. Often those are team projects as well. Instructors have found that certain students took advantage of the CR/NCR option and ceased to make an effort in the later projects, leaving their teammates to do all the hard work and ultimately affected those other students' course grades. Moreover, those practicum courses are seen as "windows" for seasoned professionals from the industry to gain a better understanding of our program as well as our students. Incidences like above had damaged the image of our study body in the industry to some extent and we would like to avoid future incidences. Therefore, both to protect our students as well as to uphold the image of our program, we would like to request the removal of CR/NCR options from those courses.

Consultation:

Resources:
STA130H1: An Introduction to Statistical Reasoning and Data Science

**Corequisites:**
MAT135H1/MAT136H1/MAT137Y1/MAT157Y1. Strongly recommended: CSC108H1/CSC120H1/CSC148H1

**Exclusions:**

**Rationale:**
The other second year introductions to statistics are all listed as exclusions, so we need to update this list to include the recently introduced course STA238H1. Students should not be able to take STA130 if they have already taken STA238H1. Similarly, students should not be able to take STA130 after taking STAA57H3 (Introduction to Data Science) at UTSc. This change will update the exclusion list for STA130 based on current course offerings.

**Consultation:**
N/A

**Resources:**

STA247H1: Probability with Computer Applications

**Prerequisites:**

**Exclusions:**
ECO227Y1/STA255H1/STA237H1/STA257H1/STAB52H3/STA256H5/ECO227Y5

**Rationale:**
The other two second-year STA sequences are already listed as exclusions (i.e., STA255H1 and STA257H1), so we need to update this list to include the recently introduced course STA237H1. STA237 is about the same level (in terms of theory and mathematical demands) of an introduction to Probability than STA247 is. Students should not be able to take STA247H1 if they have already taken STA237H1, and vice versa. STA247H1 is already listed as an exclusion for STA237H1.

Students in Statistics programs, or planning to request Statistics programs have also been taking this course since it is a less mathematically-demanding introduction to probability and statistics than STA257H1. These students should really be taking STA237/238 or STA257/261 though. STA247/248 was designed for Computer Science students. Computer Science Majors and Specialist students need to take CSC148 in their first year, so requiring STA148 instead of CSC108 as a prerequisite will more effectively limit enrolment to Computer Science students. This change will update the exclusion list for STA247 based on our current course offerings, and ensure that enrollment into these courses is limited to Computer Science students.

**Consultation:**
No consultation was required to update the exclusions with STA237H1. The Associate Chair for Undergraduate Studies in Computer Science, the Associate Chair for Undergraduate Studies in Statistics, the STA247H1 instructor and members of the Statistics Undergraduate Committee support the dropping of CSC108 (and similar courses from other campuses) to limit enrollment in this course to Computer Science students.

**Resources:**

STA248H1: Statistics for Computer Scientists

**Prerequisites:**
### Exclusions:

- ECO220Y1/ECO227Y1/GGR270Y1/PSY201H1/SOC300H1/SOC202H1/SOC252H1/STA220H1/STA221H1/

### Rationale:

The other two second-year STA sequences are already listed as exclusions (i.e., STA255H1 and STA261H1), so we need to update this list to include the recently introduced course STA238H1. STA238 is about the same level (in terms of theory and mathematical demands) of an introduction to Statistics than STA248 is. Students should not be able to take STA248H1 if they have already taken STA238H1, and vice versa. STA248H1 is already listed as an exclusion for STA238H1.

Students in Statistics programs, or planning to request Statistics programs have also been taking this course since it is a less mathematically-demanding introduction to probability and statistics. These students should really be taking STA237/238 or STA257/261 though. STA247/248 was designed for Computer Science students. Computer Science Majors and Specialist students need to take CSC148 in their first year, so requiring STA148 instead of CSC108 as a prerequisite will more effectively limit enrolment to Computer Science students. This change will update the exclusion list for STA248 based on our current course offerings, and ensure that enrollment into these courses is limited to Computer Science students.

### Consultation:

No consultation was required to update the exclusions with STA238H1. The Associate Chair for Undergraduate Studies in Computer Science, the Associate Chair for Undergraduate Studies in Statistics, the STA248H1 instructor and members of the Statistics Undergraduate Committee support the dropping of CSC108 (and similar courses from other campuses) to limit enrollment in this course to Computer Science students.

### Resources:

**STA302H1: Methods of Data Analysis I**

**Prerequisites:**

  MAT221H1(70%)/ MAT223H1/MAT240H1/MATA23H3/MAT223H5/MAT240H5

**Rationale:**

Computer Science is no longer offering CSC121H1 so these prerequisites need to be updated accordingly. Also, CSCA20H3 does satisfy the introduction to programming prerequisite on STA302, however, since it is not currently explicitly listed as a prerequisite, students with this course fail the prerequisite check and need to be manually checked and kept in the course. This change will update the prerequisites based on current course offerings.

**Consultation:**

N/A

**Resources:**

**STA314H1: Statistical Methods for Machine Learning I**

**Prerequisites:**

- STA238H1/STA248H1/STA255H1/STA261H1/STAB57H3/STA260H5/ECO227Y1; **STA260H5**: CSC108H1/
  CSC120H1/CSC121H1/CSC148H1/CSCA08H3/CSCA48H3/CSCA20H3/CSC108H5/CSC148H5; MAT223H1/
  MAT240H1/MATA23H3/MAT223H5/MAT240H5; MAT235Y1/MAT237Y1/MAT257Y1 /(MATB41H3, MATB42H3)/
  (MAT232H5, MAT236H5)/(MAT233H5, MAT236H5)

**Rationale:**

Computer Science is no longer offering CSC121H1 so the prerequisites on this course need to be updated accordingly. Students in the Statistics Major who are also pursuing an Economics program are permitted to take ECO227Y1 to satisfy the introduction to statistics and probability requirements for both programs. Therefore, STA314 should be
accessible to students in this situation as well. We have had to waive the STA prerequisite for these students on a case-by-case basis. This change will automate this process. Update requirements in calendar to align with courses currently offered and recognize a course option that students in both the Statistics Major and Economics programs take.

Consultation:
N/A

Resources:

### STA410H1: Statistical Computation

**Prerequisites:**

**Rationale:**
Computer Science is no longer offering the course. Update requirements in calendar to align with courses offered.

### STA414H1: Statistical Methods for Machine Learning II

**Prerequisites:**

**Rationale:**
Computer Science is no longer offering the course. Update requirements in calendar to align with courses offered.

### STA442H1: Methods of Applied Statistics

**Prerequisites:**

**Rationale:**
STA302 (Methods of Data Analysis I) is not sufficient preparation for this course. STA302 focusses on linear regression only; students really need the second part of this course as well (i.e., STA303) to have sufficient familiarity with other statistical models to prepare them for STA442. Both courses in the third-year sequences are listed for UTSc, but not UTStG due to prerequisites on the second course. STA302 is a prerequisite for STA303, so requiring STA303 ensures students have both. However, there is no prerequisite relationship between STAC67H3 and STAC51H3, so we need to require both to satisfy this requirement. This change will update the prerequisites based on current course offerings and ensure students will have the proper foundation for this course.

Computer Science is no longer offering the course. Update requirements in calendar to align with courses offered.

Consultation:
This was discussed with the Statistics Undergraduate Committee and members all supported this change.

Computer Science notified us that this course is no longer being offered.

**Resources:**
2 Minor Program Modifications:

Health Studies Major

Completion Requirements:

(8.0 FCEs, including at least 1.5 FCE at the 400 level.)

1. 1.0 FCE of the following courses: ANT100Y1/BIO130H1/GGR107H1/HPS100H1/HPS110H1/HPS120H1/
PCL102H1/PHS100H1/PHL100Y1/PHL101Y1/POL101Y1/PSY100H1/SOC100H1/TRN135Y1/UNI103H1/
UNI103Y1/WGS160Y1
2. HST209H1, HST211H1, and HST250H1
3. PHL281H1/INS200H1
4. STA220H1 or equivalent
5. 0.5 FCE of the following courses: ANT208H1/HMB202H1/HMB203H1/INS205H1/JSU237H1/NFS284H1/
PCL201H1/PCL218H1/SOC204H1/SOC243H1/STA221H1/TRN235H1/TRN236H1
6. HST310H1
7. HST373H1/HMB342H1
8. 1.0 FCE of the following courses: HST307H1/HST308H1/HST309H1/HST330H1/HST350H1/ANA300Y1/
HST350Y1/ANT345H1/ANT348H1/ANT358H1/EEB324H1/GGR340H1/HPS319H1/HMB303H1/HMB323H1/
INS340Y1/INS350H1/JNH350H1/PHL380H1/PHL381H1/PHL383H1/PHS300H1/SOC309H1/SOC316H1/
SOC363H1/SOC364H1/WGS367H1
9. 1.5 FCE of the following courses: HST400Y1/HST405H1/HST408H1/HST409H1/HST410H1/HST411H1/
HST440H1/HST451Y1/HST464H1/HST480H1 or another 400-level course approved by Director.
10. The remaining 0.5 FCE can include any courses not previously taken from the lists above, or any of the following: ANT434H1/ANT458H1/ANT460H1/ANT474H1/ENV430H1/GGR433H1/JFP450H1/HIS423H1/HIS498H1/
HMB322H1/HMB406H1/HMB433H1/HMB462H1/IRE378H1/NEW344Y1/PSY333H1/SOC412H1/SOC488H1

Description of Proposed Changes:
Adding in more electives

Rationale:

Impact:

Consultation:
The Program Director has consulted with other units; changes were proposed and approved through the UC Curriculum committee and will be brought forward for final review/approval through UC Council.

Resource Implications:

Health Studies Specialist

Completion Requirements:

(12.0 FCEs, including at least 2.0 FCE at the 400 level.)
University College

1. 1.0 FCE of the following courses: ANT100Y1/BIO130H1/GGR107H1/HPS100H1/HPS110H1/HPS120H1/ PCL102H1/PHS100H1/PHL100Y1/PHL101Y1/POL101Y1/PSY100H1/SOC100H1/TRN135Y1/UNI103H1/ UNI103Y1/WGS160Y1

2. HST209H1, HST211H1, and HST250H1

3. PHL281H1 or INS200H1

4. STA220H1 or equivalent

5. 1.0 FCE of the following courses: ANT208H1/HMB202H1/HMB203H1/INS205H1/JSU237H1/NFS284H1/ PCL201H1/PCL218H1/PHL281H1/SOC204H1/SOC243H1/STA221H1/TRN235H1/TRN236H1

6. HST310H1

7. HST373H1/HMB342H1

8. HST350H1

9. 2.0 FCE of the following courses: HST307H1/HST308H1/HST309H1/HST330H1/HST350Y1/ANA300Y1/ ANT345H1/ANT348H1/ANT358H1/EEB324H1/GGR340H1/HPS319H1/HMB303H1/HMB323H1/INS340Y1/ INS350H1/JNH350H1/PHL380H1/PHL381H1/PHL383H1/PHS300H1/SOC309H1/SOC316H1/SOC363H1/ SOC364H1/WGS367H1

10. HST450Y1

11. 1.0 FCE of the following courses: HST405H1/HST408H1/HST409H1/HST410H1/HST411H1/HST440H1/ HST451Y1/HST464H1/HST480H1 or another 400-level course approved by Director.

12. The remaining 2.0 FCEs can include any courses not previously taken from the lists above, or any of the following: ANT434H1/ANT458H1/ANT460H1/ANT474H1/ENV430H1/GGR433H1/JFP450H1/HIS423H1/HIS498H1/ HMB322H1/HMB406H1/HMB433H1/HMB462H1/HST400Y1/IRE378H1/NEW344Y1/PSY333H1/SOC412H1/ SOC488H1

Description of Proposed Changes:
Adding in more electives

Rationale:

Impact:

Consultation:
The Program Director has consulted with other units; changes were proposed and approved through the UC Curriculum committee and will be brought forward for final review/approval through UC Council.

Resource Implications: