Academic Unit: New College

Modifications to Major/Specialist

Department/Unit: New College
Program: Caribbean Studies Major

Underline the appropriate category among the following four:
Major Modification A (existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

PART I – Calendar Entry

Please fill in spaces with your own words. Expand boxes as needed.

1. Description

Caribbean Studies is an interdisciplinary undergraduate program that consists of courses on Caribbean history and society, politics and economic development, literature and thought. Our courses deal with a wide range of issues including gender, religion, politics, culture, ethnicity, race, development, language, colonialism, the environment and regional common markets. We offer a uniquely comprehensive approach to the study of the Caribbean, with a range of course offerings that focus on specific topics/themes, or geographic/linguistic areas of the Caribbean, or take a specific disciplinary perspective. There are also courses that introduce students to interdisciplinarity, or that survey the region as a whole.

This program has unlimited enrolment and no specific admission requirements. All students who have completed at least 4.0 courses are eligible to enroll. Students can major in Caribbean Studies by completing seven full course equivalents, including two full course equivalents at the 300-level or above.

Caribbean Studies Major (7 full courses or their equivalent, including at least two FCEs at the 300+level, 0.5 of which must be at the 400 level)

First Year:
1. NEW1XXY
Higher Years:
2. One of HIS294Y1,NEW222Y1, NEW224Y1
3. JQR360H1
4. 2.5 full courses or their equivalent from the Core Group at the 300+level
5. 2 full courses or their equivalent from Group A or B OR 1 full courses or their equivalent from Group A or B if taking two of NEW222Y1, NEW224Y1 or HIS294Y1.

Core Group:
NEW222Y1; NEW224Y; HIS294Y; NEW320H1, NEW321H1, NEW324H1, NEW325H1, NEW328H1, NEW329H1, JHN323H1; JLN327H1; NEW421H1, NEW423H1, NEW424Y1, NEW426H1, NEW426Y1, NEW427H1, NEW428H1 HIS474H1; SPA486H1,

Group A:
ENG359H1; ENG366H1, ENG369H1; HIS106Y1, HIS292H1, HIS305H1, HIS312H1, HIS359H1, HIS360H1, HIS413H1, HIS446H1, LAS302H1, MUS305H1, POL201Y1, SPA220Y1, SPA487H1, WGS375H1, WGS380H1, WGS445H1, WGS450H1

Group B:
ABS201Y1, ABS250H1, ABS300Y1, ABS302H1, ABS322H1, ABS355H1, ABS390H1, ABS402H1, ABS491Y1; ANT316H1, ANT322H1, ANT324H1, ANT345H1, ANT346H1,
ANT364H1, ANT370H1, ANT372H1, ANT374H1, ANT412H1, ANT427H1, ANT451H1, ANT452H1, ANT469H1, ARC233H1, CIN332Y1, CRI383H1, CRI487H1, DRM362H1, DTS200Y1, DTS401H1, DTS402H1, DTS403H1, EEB215H1, EEB255H1, ECO303Y1, ENG270Y1, ENG285H1, ENG370H1, ENV322H1, ENV422H1, FOR201H1, FOR306H1, FRE240H, FRE324H1, FRE332H1, FRE336H1, GGR240H1, GGR338H1, HAJ453H1, HIS301H1, HIS390Y1, JPA462H1, JPR374H1, JPU315; NEW150Y1, NEW240Y1, NEW270H1, NEW322H1, NEW351Y1, NEW359H1, PHL316H1, PHL362H1, POL201Y1, POL305Y1, POL326Y1, POL349H1, POL343H1, POL417Y1, POL424H1, POL429H1, POL445H1, POL447H1, POL482H1, RLG100Y1, RLG243H1, RLG280Y1, RLG233H1, RLH233H1, SOC336H1, SOC383H1, UNI335H1, WGS273H1, WGS369H1, WGS385H1, WGS426H1, WGS440H1, WGS450H1, WGS463H1

(Note: Students are responsible for checking the co- and prerequisites for HIS474H1, SPA486H1, and all courses in Group A and B. Some of these courses may not be offered on a regular basis, and/or may only be available to students who are enrolled in a POSB sponsored by the department or unit offering the course. Not all electives are offered every year. Courses listed in the current academic calendar that include significant Caribbean content but are not listed as courses that meet Caribbean Studies Program requirements may be considered, in consultation with the Caribbean Studies Program Director.)

2. Academic Context

Please outline the elements of the context that explain the reasons why this program exists or should exist and why it is designed this way, from the students' point of view. These could include the relation of the program to the discipline and/or the students' interests and academic needs. This section may include useful information on possible career paths.

Established in 1995, the undergraduate Caribbean Studies program offers rigorous interdisciplinary training in the study of the complexity of issues pertaining to Caribbean thought, history, culture, politics, and society, and to Caribbean peoples and their descendants in their second diasporic presences in North America, Europe and elsewhere. As a Caribbean hub, with arguably the largest per capita concentration of Caribbean cultural producers, Toronto is an ideal location for a program that engages the wider community as part of our pedagogical approach, and takes a leading role in shaping the field of Caribbean Studies. The program emphasizes Caribbean thought and intellectual traditions to move beyond approaches that relegate the Global South as spaces for exciting fieldwork but never as sources of theorizing and knowledge production. Moreover, Caribbean Studies is not simply about the Caribbean (although, with a population of some 37.5 million that does not include its diasporas, that alone is an excellent rationale). Caribbean histories and geographies disclose a unique and necessarily critical vantage point on wider world processes. For instance, what we engage in Canada under the official rubric of multiculturalism has a 40-year history. In the Caribbean, on the other hand, it has been five centuries in the making, and the Caribbean’s 6000-year history of indigenous presence is a crucial counterpoint to continental patterns of indigenous experience in the Americas. In short, the impact of Caribbean Studies is far-reaching.

Graduates from the program have gone on to work in the following fields: ethical and environmentally-conscious business practices in an increasingly transnational world; journalism and media; development, human rights, and NGO-work; graduate school and tenure-track positions in academia; human resources management; community-based fundraising and organization; artistic and cultural production; social entrepreneurship; teaching, ECE-training, and developing educational policy in a multicultural social setting; public policy; law.
3. Learning Outcomes

Please give a detailed description of the Learning Outcomes of this program, including those which are in the Calendar description. They should include the goals concerning the disciplinary or interdisciplinary knowledge, understanding of relevant methodologies, and the skills students will have acquired on completion of the program; and, if not clear from the Program Description, the way these outcomes are achieved as students progress through the program (so that students are aware of what they should have accomplished by the end of each year).

Caribbean Studies equips students to think about broad, theoretical and challenging intellectual issues on the one hand, and, at the same time, to ground that capacious thinking in deep understanding of the particular historical, political, economic, geographical, cultural and linguistic realities of the Caribbean and its diasporas. This combined interdisciplinary and area studies approach prepares students to think across disciplines about these kinds of issues, and to base their comparative, transnational and interdisciplinary thinking in concrete knowledge of the Caribbean and its people. Students come away from a Major in Caribbean Studies understanding that all places matter, and all societies, histories and cultures can serve as a vantage point from which to take on much broader and wide-ranging questions. The study of the Caribbean equips students to question the order of things, reflect on their own place in the world, and helps them to see past the Caribbean’s size or current level of geo-political influence (and, by extension, any other relatively poor or powerless region of the world) to see the inherent value and intellectual significance of all places and all people.

Please see Degree Objectives 4.1 (Depth of Knowledge) for a detailed description of the learning pathways through program courses designed to achieve these outcomes.

4. Degree Objectives

Means by which students will satisfy the following Degree Objectives (with reference to the Degree Objectives Guidelines). For each objective, please be specific and show how each of the objectives will be achieved within the program in a way that would apply to all students enrolled, whichever courses they choose among elective courses.

4.1 DEPTH OF KNOWLEDGE

Please state how particular courses and/or course sequences in your program achieve depth (as defined in the Degree Objectives Guidelines).

The Major Program in Caribbean Studies offers a progression from 100 to 400-level courses that ensure that, whatever courses they choose from among the Program’s offerings, students have been exposed to all of the following approaches to the study of the Caribbean:

1) Single discipline and interdisciplinary courses;
2) Multilingual approaches (exploring the Caribbean’s many European, indigenous, Asian and African-derived language heritages) as well as the opportunity to focus on specific linguistic zones;
3) The study of the Caribbean as a geographic region as well as the Caribbean as a range of interconnected diasporic sites and networks;
4) An integrative approach to classroom learning, knowledge production and social justice;
5) The Caribbean as a crucial site for understanding global and transnational processes.

At the same time the program takes students through ‘learning pathways’ that allow them to move from acquiring broad and general knowledge towards higher levels of focus and specialization. Later courses build on the foundation laid at the previous level, introducing progressively more challenging conceptual material and a broader range of substantive topics, and requiring more sophisticated evaluation and integration of diverse disciplinary perspectives.
These pathways are: (1) Language, Arts and Culture (2) Interdisciplinarity and Theory (3) History, Geo-Politics and Social Sciences.

As students move through the Major in Caribbean Studies they further refine their own interests and points of focus according to these ‘learning pathways’. Each student is required to take the new 100-level interdisciplinary introductory course, which prepares students for the different ways that they can approach their future learning about the Caribbean. At the 200-level students choose between NEW222Y, HIS294Y and NEW224Y. Each of these three courses is still broadly themed and takes a survey-approach to the study of the Caribbean; however, NEW222Y does this from a language, arts and culture perspective; NEW224Y from an interdisciplinary perspective with a focus on Caribbean intellectual and political thought; and HIS294Y from a socio-historical and geo-political perspective.

At the 300-level students have the opportunity to take courses that are more specific in their focus, deepening knowledge of approaches and themes to which students have already been introduced at the 100 and 200 levels. This depth of focus may be according to the disciplinary approach taken in the course (NEW321H “Caribbean Visual Culture, Social Media and Performance”; NEW325H “Caribbean Women Writers” and NEW320H “Historical Geography of the Caribbean”). It may also be an interdisciplinary course that focuses on a specific theme (JHN323H “Indigeneity in the Caribbean”; NEW324H “The Contemporary Caribbean in a Global Context”; JLN327H “Regional Perspectives on the Hispanic Caribbean” and NEW328H “Caribbean Indentureship and its Legacies”).

The core 400 level courses are advanced seminars that offer a small group learning experience, facilitated by the instructor but requiring more self-direction from students. Students can consolidate their previous work in Caribbean Studies by producing a major research paper involving inquiry outside of the course readings, and/or a creative project, and giving major presentations on a specific theme. These courses refine students’ knowledge of specific aspects of/approaches to the study of the Caribbean, preparing them to continue to pursue these particular themes or approaches after their undergraduate education in their future lives. These courses also represent the conclusion, within our program, of the learning pathways in Language, Arts and Culture, in Interdisciplinarity and Theory, and in History, Geo-Politics and Social Sciences that students began with at the 100 and 200 levels. The 400-level courses are NEW421H “Global Perspectives on the Haitian Revolution”; NEW424Y “The Capitalist Press”; NEW427H “Advanced Topics in the Hispanic Caribbean (focus on Cuba); NEW428H “Caribbean Migrations and Diasporas”; NEW4XXH “Caribbean Diaspora in Canada”; HIS474H “Historical Narratives of Caribbean Decolonization”; SPA486H Caribbean Literatures and Identities.

The choice of electives available to students through Group A and B offerings is also intended to help strengthen the program’s learning pathways by offering students a high degree of breadth and further options for specialization. Students are expected to apply the critical skills and analytical tools that they develop in core courses to these electives. Group A courses are courses which are either Caribbean-focused or in which the Caribbean forms a key component of the knowledge to be acquired in the course. Group B courses are courses in which Caribbean Studies students can directly apply their knowledge of the Caribbean and skills developed through Caribbean Studies to the subject matter.

NEW329H and NEW429H are special topics courses, which allow the program to introduce new courses and themes. This is an essential part of ongoing efforts to keep the program dynamic, current and responsive to changes in the field of Caribbean Studies.
Please describe how each of the following Competencies (as defined in the Degree Objectives Guidelines) is developed within the program to the degree relevant to the area/discipline. For each Competency, please be specific and show how each of the objectives will be achieved within the program in a way that would apply to all students enrolled, whichever courses they choose among elective courses. If a Competency cannot be satisfied within your course offerings, include courses from other units that students can use to fulfil that Competency.

4.2.1 CRITICAL AND CREATIVE THINKING
Beginning at the 100-level students develop critical and creative thinking through exposure to the Caribbean’s own rich intellectual traditions. They are supported through the program as they learn to engage with that intellectual tradition in ever-more sophisticated ways, and apply that knowledge across the different learning pathways of the program. Students develop critical thinking by understanding the different approaches of academic disciplines, learning how to effectively question established truths and how to understand broad patterns in the world from the vantage point of deep knowledge of a specific place. Students learn how to develop their own arguments through a range of different kinds of assignments and disciplinary approaches. Students also make their own increasingly refined choices about what methodologies they will use to develop and answer key scholarly questions. Students are encouraged to think critically about the impact of linguistic, cultural and geographic heritage on how humans perceive the world, through exposure to Caribbean scholarship, policy and political history, arts and culture, and social media across languages.

4.2.2 COMMUNICATION
Communication skills are developed throughout the program using various multi-media formats including written essays, oral presentations, media analysis and graphs and charts. All core courses include writing components and presentations, and the program offers strong individual support from faculty for all students at all levels. As students progress through the program their expected communication skills become more advanced. Individual and group oral presentations are required components of all second, third and fourth year core courses.

4.2.3 INFORMATION LITERACY
Students in Caribbean Studies develop the ability to retain, deploy and engage critically and effectively with key arguments found in course material in a range of different media. They develop strong skills with regards to governmental policy and media analysis and an ability to grasp the implications and meanings of various forms of reportage in a world where access to news and media are increasingly a part of everyday life. We emphasize critical analytical skills with regards to information that has implications in terms of social justice, particularly race, gender, sexuality, migration, environment, religion and ethnicity, class, economic inequality and conflict. These skills are developed through a range of assignments that offer students the opportunity to learn to locate, evaluate and cite from material found in libraries and on the internet. The efforts at developing information literacy and communication skills are strongly supported by collaborations with the New College Writing Centre and the New College Library.

4.2.4 QUANTITATIVE REASONING
JQR 360H1: The Canadian Census: Populations, Migrations and Demographics approaches the census as a statistical tool in the context of the ideological project of citizenship and nationalism. It trains students to pose questions and formulate hypotheses using census data and to use the data as evidence in order to apply quantitative reasoning to the social equity emphasis of the program’s other course offerings. This course is shared with a group of other units (Latin American Studies, Diaspora Studies, African Studies and Equity Studies) who share a similar mandate but who bring other geographical or thematic perspectives to the question of how to combine quantitative reasoning with social justice analysis. The interdisciplinary background of Caribbean Studies students, as well as the heterogeneous nature of the programs that share this course, serve to enhance students’ understanding of how different disciplinary, thematic
and geographic perspectives shape quantitative thinking and outcomes.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY
Our program encourages students to see themselves as active agents rather than passive consumers in the production of social transformative ideas and culture. We create an academic environment that fosters social responsibility, a commitment to justice and global awareness, and a sense that our graduates may actively pursue these things in the world, and that these goals are relevant to all career paths. We help students to think integratively, and to be able to see the contemporary and historical connections between the different elements of our complex global society. In other words, we want them to see linkages and possibilities that might be obvious in a different and better world, but which have been obscured in our own by social injustice. Our close collaborations with other units, members of the Caribbean community, and the New College Community Engaged Learning program help students to think ethically about the privileges and responsibilities that come with a university education, and to consider the social and political implications of research and knowledge production.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Please indicate which courses or other appropriate activities, especially in third and fourth year, are eligible means for satisfying this program requirement. The Degree Objectives Guidelines provides both definition and guidelines, with examples of the many types of appropriate courses or other activities.

200- and 300-level courses build the skills in research, analysis and reflection that prepare students for the more sophisticated requirements of independent research at the 400-level. Students are prepared for a major research paper, presentations and seminar-style discussion and participation.

All 3rd and 4th year courses require major research papers that draw on all of the key themes of the course, but which require students to synthesize and integrate that material in their own way. Some require presentations of the research that went into the paper, and this verbal communication of ideas is tied to the ability to communicate them in writing. One course (NEW428H) has students make a film synthesizing theory and practice, requiring students to integrate the course material with their own independent research, based on documents, media analysis and their own critical reflection drawing from the course materials. The seminar format of the 4th year courses supports students with the process of developing their own themes for their integrative research activities.

A limited number of students also have the opportunity to do independent research courses as a program elective option.

PART II – Internal Information for Governance

Please fill in spaces with your own words. Expand boxes as needed.
Refer to the Checklist to make sure you are filling all sections relevant to the type of proposal.

5. Rationale and Background Information
Please provide any additional information that would be of relevance to the committees reviewing the proposal. This may include a more detailed rationale, related to the unit's priorities or the institutional plans, as well as information concerning the motivations behind the design, redesign, or creation of the program.

Note: If this is a Specialist program with greater than 14 FCEs, please give the explicit rationale in terms of the multi-unit training necessary.

When the Program was established 20 years ago there were very few courses that examined the Caribbean at U of T. This has transformed dramatically and the program has been going through changes designed to reflect the presence of more specialized knowledge and courses
available and the developing teaching capabilities of the program’s now more experienced and senior instructors. We have moved rapidly from an era not long ago when there were only a few courses that tried to teach everything relevant to the Caribbean to much greater capacity in terms of breadth, depth and specialization.

The addition of a required 100 level course reflects the need to attract students earlier and to provide interdisciplinary information about the Caribbean at a more basic level. The program needs to bridge the steep learning curve for students between what they might have learned in high school about the Caribbean, and the program requirements at the 200 level, which not all students are ready for at the beginning of their university careers. The new 100-level course also expands the range of courses available to first year students generally. We aim to enhance the Interdisciplinary learning pathways in the program, as well as the Language, Arts and Culture pathway. NEW222Y has long existed as both an H and a Y course but it now becomes an option for the 200 level requirement. We have also added a requirement for .5 FCE 400 level course. In keeping with the suggestions made in the 2012 External Review, we aim to foster renewal as well as increased coherency and diversity of course offerings, which will enhance enrolment.

These enhancements of interdisciplinarity and of breadth, depth and specialization contribute to New College’s priorities to encourage interdisciplinarity and to advance teaching and scholarship that centres social justice, equity, anti-racism and activism, and community-engaged learning.

6. Summary of Changes (required for Minor Changes and Major Modifications A)

Please summarize how the proposed program differs from the program as it currently appears in the Calendar. List the changes that have been made to your current program for all the categories below. (If no change was done, please indicate none.)

- Learning Objectives:

At present, there are two entry-level courses at the 200-level among which students must choose one: NEW224Y emphasizes ‘Thought’ and interdisciplinary perspectives while HIS294Y provides a historical survey. In order to give new students more access to the opportunity to learn about the Caribbean at a level that is appropriate for them, we are adding a required 100 level course to serve two functions: first, it introduces students to the interdisciplinary study of the Caribbean at a much earlier stage, and therefore is an appropriate building block for NEW224Y and the program’s interdisciplinary pathway. Second, it ensures that all students, even those who choose to take more disciplinary or thematic specializations rather than an interdisciplinary approach, start out with a broad introduction to Caribbean Studies across the disciplines. This helps students to make more informed future courses choices as they navigate their way along the program’s pathways.

We propose to expand NEW222H1 to a Y course, in order to further enhance the interdisciplinary pathways. All three 200 level courses take a pan-Caribbean and pan-linguistic perspective, but NEW222Y does so from the disciplinary perspective of Language and Comparative Literature. This introduces students to Caribbean literature, which has been a fundamental field in the emergence of the modern study of the Caribbean. English, French and Spanish literatures of the Caribbean are taught in the departments of English, French and Spanish and Portuguese, but this is a unique opportunity for students to study literatures from the Caribbean’s multiple linguistic zones in one course.

- Modes of Delivery:

No change.
Changes in Program Requirements:
- Move from 6 full course requirements to 7
- Introduction of a new required 100 level course.
- NEW222Y is reweighted from an ‘H’ to a Y course and now becomes an option for the 200 level requirement. One FCE from among NEW222Y, NEW224Y and HIS294Y is required.
- Requirement of a 0.5 full course equivalent at the 400 level.
- Addition of SPA486H and HIS474H as core courses rather than Group A courses.

New Courses:
NEW1XXY1: Introduction to Caribbean Studies
NEW4XXH1: Caribbean Diaspora in Toronto

Deleted Courses:

7. Departmental/College Resource Implications

Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.

<table>
<thead>
<tr>
<th>Estimated enrolment per academic year in this program (please explain)</th>
<th>Total enrolment estimate is 80. Enrolments figures have been fairly consistent over the last several years, ranging between 65-80 students. It is anticipated that the renewal of the program will push the numbers up to the upper range of our usual figures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>New courses necessary to mount for this program</td>
<td>NEW1XXY1</td>
</tr>
<tr>
<td>Additional instructor requirements</td>
<td>Up to another 1.5 FCE instructorship may be required in order to make NEW222H1 a Y course and to introduce NEW1XXY1. This could be covered through sessional hirings. NEW4XXH1 The Caribbean Diaspora in Canada will alternate with NEW324H1 and requires no additional resources.</td>
</tr>
<tr>
<td>Teaching assistant requirements</td>
<td>If enrolments increase beyond our current upper range, we may need TA hours in the introductory course.</td>
</tr>
<tr>
<td>Laboratory equipment requirements</td>
<td>N/A</td>
</tr>
<tr>
<td>Computing resource requirements</td>
<td>None.</td>
</tr>
<tr>
<td>Libraries resource requirements</td>
<td>No new requirements.</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

DELETE the statement that DOES NOT apply:

I will provide these resources required for this program from my existing budget.

DATE | Name of Chair/Program Director
### 8. Impact on your Units or Others

Please describe the impact on your unit’s program of study and any impact on other programs or units. If you list a course or courses offered by another units in your program you must provide a letter from the head of that unit stating that students in your program will be included amongst those with priority enrolment access (in cases where there are enrolment controls).

Impact on other units: There will be no enrolment pressure on other units. Caribbean Studies knowledge is valuable for all programs. The 100-level course will increase the program’s dynamic relationship with other units, giving more students access to knowledge about the Caribbean at an earlier stage in their university careers. The expansion of NEW222 from H to Y (“Comparative Caribbean Literature”) increases the program’s points of positive intersection with other units such as English, Spanish and Portuguese, and French.

We have been granted medium priority access to HIS474H and SPA486H, which is not expected to cause enrolment pressure. This access was requested by the instructors of these courses, who both felt strongly that the presence of Caribbean Studies students in the classroom greatly enriched the learning environment for all.

These changes increase the number of points of dialogue between Caribbean Studies and other units. Other examples of courses which already do this are JLN327H and JHN323H, which are jointly offered with Latin American Studies and with History respectively.

### 9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

**Impact on Students and Student Accommodation**

Please outline the expected impact on continuing students and how they will be accommodated.

Students already in the program will continue to be subject to the requirements that were in existence the year that they enrolled, and there is therefore no expected impact on continuing students, other than that they continue to benefit from the innovations and increases in the program’s course offerings. More ‘H’ courses have been brought into existence in recent years in order to support the new emphasis on ‘learning pathways’ and increase the number of points of dialogue between Caribbean Studies and other units. Examples: JLN327H and JHN323H are jointly offered with Latin American Studies and with History.

### 10. For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)

**Need and Demand**

Please provide a brief description of the need and demand for the proposed program (e.g., student interest, social need, employment opportunities, interest expressed by professional associations or government agencies).

N/A

### 11. For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)

**Assessment of Learning**

Please describe how the methods for assessing student achievements are appropriate and effective relative to the Degree Objectives and Learning Outcomes.

N/A
Modifications to Major/Specialist

Department/Unit: New College
Program: Caribbean Studies Specialist

Underline the appropriate category among the following four:

Major Modification A (existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

PART I – Calendar Entry

Please fill in spaces with your own words. Expand boxes as needed.

1. Description

The Specialist Program in Caribbean Studies fosters a critical, deep and broad understanding of the Caribbean and its diasporas. Caribbean Studies is an interdisciplinary undergraduate program that consists of courses on Caribbean history and society, politics and economic development, literature and thought. Our courses deal with a wide range of issues including gender, religion, politics, culture, ethnicity, race, development, language, colonialism, the environment and regional common markets. We offer a uniquely comprehensive approach to the study of the Caribbean, with a range of course offerings that focus on specific topics/themes, or geographic/linguistic areas of the Caribbean, or take a specific disciplinary perspective. There are also courses that introduce students to interdisciplinarity, or that survey the region as a whole.

This program has unlimited enrolment and no specific admission requirements. All students who have completed at least 4.0 courses are eligible to enroll. Students can do a Specialist in Caribbean Studies by completing ten full course equivalents, including four full course equivalents at the 300-level, one FCE of which must be at the 400-level.

Caribbean Studies Specialist (10 full courses or their equivalent, including at least four FCEs at the 300+ level, one FCE of which must be at the 400-level)

First Year:
1. NEW1XXY

Higher Years:
2. One of HIS294Y1/NEW222Y1/NEW224Y1
3. JQR360H1
4. 3.5 full courses or their equivalent from the Core Group (including at least 2.5 at the 300+ level)
5. 2 full courses or their equivalent from Group A (including at least 1 FCE at the 300+ level)
6. 2 full courses or their equivalent from Groups A or B

Core Group:
NEW222Y1; NEW224Y; HIS294Y; NEW320H1, NEW321H1, NEW324H1, NEW325H1, NEW328H1, NEW329H1, JHN323H1; JLN327H1; NEW421H1, NEW423H1, NEW424Y1, NEW426H1, NEW426Y1, NEW427H1, NEW428H1 HIS474H1; **SPA486H1**,

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(Note: Students are responsible for checking the co- and prerequisites for HIS474H1, SPA486H1, and all courses in Group A and B. Some of these courses may not be offered on a regular basis, and/or may only be available to students who are enrolled in a POST sponsored by the department or unit offering the course. Not all electives are offered every year. Courses listed in the current academic calendar that include significant Caribbean content but are not listed as courses that meet Caribbean Studies Program requirements may be considered, in consultation with the Caribbean Studies Program Director.)

2. Academic Context

Please outline the elements of the context that explain the reasons why this program exists or should exist and why it is designed this way, from the students' point of view. These could include the relation of the program to the discipline and/or the students' interests and academic needs. This section may include useful information on possible career paths.

Established in 1995, the undergraduate Caribbean Studies program offers rigorous interdisciplinary training in the study of the complexity of issues pertaining to Caribbean thought, history, culture, politics and society, and to Caribbean peoples and their descendants in their second diasporic presences in North America, Europe and elsewhere. As a Caribbean hub, with arguably the largest per capita concentration of Caribbean cultural producers, Toronto is an ideal location for a program that engages the wider community as part of our pedagogical approach, and takes a leading role in shaping the field of Caribbean Studies. The program emphasizes Caribbean thought and intellectual traditions to move beyond approaches that relegate the Global South as spaces for exciting fieldwork but never as sources of theorizing and knowledge production. Moreover, Caribbean Studies is not simply about the Caribbean (although, with a population of some 37.5 million that does not include its diasporas, that alone is an excellent rationale). Caribbean histories and geographies disclose a unique and necessarily critical vantage point on wider world processes. For instance, what we engage in Canada under the official rubric of multiculturalism has a 40-year history. In the Caribbean, on the other hand, it has been five centuries in the making, and the Caribbean’s 6000-year history of indigenous presence is a crucial counterpoint to continental patterns of indigenous experience in the Americas. In short, the impact of Caribbean Studies is far-reaching.

Graduates from the program have gone on to work in the following fields: ethical and environmentally-conscious business practices in an increasingly transnational world; journalism and media; development, human rights, and NGO-work; graduate school and tenure-track positions in academia; human resources management; community-based fundraising and organization; artistic and cultural production; social entrepreneurship; teaching, ECE-training, and developing educational policy in a multicultural social setting; public policy; law.
3. Learning Outcomes

Please give a detailed description of the Learning Outcomes of this program, including those which are in the Calendar description. They should include the goals concerning the disciplinary or interdisciplinary knowledge, understanding of relevant methodologies, and the skills students will have acquired on completion of the program; and, if not clear from the Program Description, the way these outcomes are achieved as students progress through the program (so that students are aware of what they should have accomplished by the end of each year).

The Specialist Program in Caribbean Studies provides students with comprehensive and interdisciplinary knowledge of broad, theoretical and challenging intellectual issues. At the same time, the Specialist Program prepares students to ground that capacious thinking in deep and broad understanding of the particular historical, political, economic, geographica, cultural and linguistic realities of the Caribbean and its diasporas. This combined interdisciplinary and area studies approach prepares students to think across disciplines about these kinds of issues, and to base their comparative, transnational and interdisciplinary thinking in concrete knowledge of the Caribbean and its people. Students come away from a Specialist in Caribbean Studies understanding that all places matter, and all societies, histories and cultures can serve as a vantage point from which to take on much broader and wide-ranging questions. The study of the Caribbean equips students to question the order of things, reflect on their own place in the world, and helps them to see past the Caribbean’s size or current level of geo-political influence (and, by extension, any other relatively poor or powerless region of the world) to see the inherent value and intellectual significance of all places and all people.

Please see Degree Objectives 4.1 (Depth of Knowledge) for a detailed description of the learning pathways through program courses designed to achieve these outcomes.

4. Degree Objectives

Means by which students will satisfy the following Degree Objectives (with reference to the Degree Objectives Guidelines). For each objective, please be specific and show how each of the objectives will be achieved within the program in a way that would apply to all students enrolled, whichever courses they choose among elective courses.

4.1 DEPTH OF KNOWLEDGE

Please state how particular courses and/or course sequences in your program achieve depth (as defined in the Degree Objectives Guidelines).

The Specialist Program in Caribbean Studies offers a progression from 100 to 400-level courses that ensure that, whatever courses they choose from among the Program’s offerings, students have been exposed to all of the following approaches to the study of the Caribbean:

1) Single discipline and interdisciplinary courses;
2) Multilingual approaches (exploring the Caribbean’s many European, indigenous, Asian and African-derived language heritages) as well as the opportunity to focus on specific linguistic zones;
3) The study of the Caribbean as a geographic region as well as the Caribbean as a range of interconnected diasporic sites and networks;
4) An integrative approach to classroom learning, knowledge production and social justice;
5) The Caribbean as a crucial site for understanding global and transnational processes.

At the same time, the program takes students through ‘learning pathways’ that allow them to move from acquiring broad and general knowledge towards higher levels of focus and specialization. Later courses build on the foundation laid at the previous level, introducing progressively more challenging conceptual material and a broader range of substantive topics,
and requiring more sophisticated evaluation and integration of diverse disciplinary perspectives. These pathways are: (1) Language, Arts and Culture (2) Interdisciplinarity and Theory (3) History, Geo-Politics and Social Sciences.

It is expected that students in the Specialist Program will emerge from the program with enhanced understanding of at least two of the 5 approaches outlined above and two of the learning pathways.

As students move through the Specialist program in Caribbean Studies they further refine their own interests and points of focus according to these ‘learning pathways.’ Each student is required to take the new 100-level interdisciplinary introductory course, which prepares students for the different ways that they can approach their future learning about the Caribbean. At the 200-level students must take at least one of NEW222Y, HIS294Y and NEW224Y. Each of these three courses is still broadly themed and takes a survey-approach to the study of the Caribbean; however, NEW222Y does this from a language, arts and culture perspective; NEW224Y from an interdisciplinary perspective with a focus on Caribbean intellectual and political thought; and HIS294Y from a socio-historical and geo-political perspective.

At the 300-level students have the opportunity to take courses that are more specific in their focus, deepening knowledge of approaches and themes to which students have already been introduced at the 100 and 200 levels. This depth of focus may be according to the disciplinary approach taken in the course (NEW321H “Caribbean Visual Culture, Social Media and Performance”; NEW325H “Caribbean Women Writers” and NEW320H “Historical Geography of the Caribbean”). It may also be an interdisciplinary course that focuses on a specific theme (JHN323H “Indigeneity in the Caribbean”; NEW324H “The Contemporary Caribbean in a Global Context”; JLN327H “Regional Perspectives on the Hispanic Caribbean” and NEW328H “CaribbeanIndentureship and its Legacies”).

The core 400 level courses are advanced seminars that offer a small group learning experience, facilitated by the instructor but requiring more self-direction from students. Students can consolidate their previous work in Caribbean Studies by producing a major research paper involving inquiry outside of the course readings, and/or a creative project, and giving major presentations on a specific theme. These courses refine students’ knowledge of specific aspects of/approaches to the study of the Caribbean, preparing them to continue to pursue these particular themes or approaches after their undergraduate education in their future lives. These courses also represent the conclusion, within our program, of the learning pathways in Language, Arts and Culture, in Interdisciplinarity and Theory, and in History, Geo-Politics and Social Sciences that students began with at the 100 and 200 levels. The 400-level courses are NEW421H “Global Perspectives on the Haitian Revolution”; NEW424Y “The Capitalist Press”; NEW427H “Advanced Topics in the Hispanic Caribbean (focus on Cuba); NEW428H “Caribbean Migrations and Diasporas”; NEW4XXH “Caribbean Diaspora in Canada”; HIS474H “Historical Narratives of Caribbean Decolonization”; SPA486H Caribbean Literatures and Identities.

Specialists in Caribbean Studies will take the majority of these 300- and 400-level core courses, giving them an enhanced understanding that integrates two of the Caribbean Studies Program’s main approaches, as well as knowledge that incorporates two of the program’s learning pathways.

The choice of electives available to students through Group A and B offerings is also intended to help strengthen the program’s learning pathways by offering students a high degree of breadth and further options for specialization. Students are expected to apply the critical skills and analytical tools that they develop in core courses to these electives. Group A courses are
courses which are either Caribbean-focused or in which the Caribbean forms a key component of the knowledge to be acquired in the course. Group B courses are courses in which Caribbean Studies students can directly apply their knowledge of the Caribbean and skills developed through Caribbean Studies to the subject matter. Specialists in Caribbean Studies will take a minimum of two and a maximum of four full courses from Group A, which will allow them to emerge from the program which knowledge of the Caribbean that integrates disciplinary and interdisciplinary perspectives. At the same time, Specialists will have an enhanced opportunity for specialization at the 300- and 400-levels. They may choose Group A/B courses that fine-tune their skills in one or more of the Program’s approaches and learning pathways. They may also choose courses that allow them to focus more in depth on a particular discipline.

NEW329H and NEW429H are special topics courses, which allow the program to introduce new courses and themes. This is an essential part of ongoing efforts to keep the program dynamic, current and responsive to changes in the field of Caribbean Studies.

4.2 COMPETENCIES

Please describe how each of the following Competencies (as defined in the Degree Objectives Guidelines) is developed within the program to the degree relevant to the area/discipline.

For each Competency, please be specific and show how each of the objectives will be achieved within the program in a way that would apply to all students enrolled, whichever courses they choose among elective courses.

If a Competency cannot be satisfied within your course offerings, include courses from other units that students can use to fulfill that Competency.

4.2.1 CRITICAL AND CREATIVE THINKING

Beginning at the 100-level students develop critical and creative thinking through exposure to the Caribbean’s own rich intellectual traditions. They are supported through the program as they learn to engage with that intellectual tradition in ever-more sophisticated ways, and apply that knowledge across the different learning pathways of the program. Students develop critical thinking by understanding the different approaches of academic disciplines, learning how to effectively question established truths and how to understand broad patterns in the world from the vantage point of deep knowledge of a specific place. Students learn how to develop their own arguments through a range of different kinds of assignments and disciplinary approaches. Students also make their own increasingly refined choices about what methodologies they will use to develop and answer key scholarly questions. Students are encouraged to think critically about the impact of linguistic, cultural and geographic heritage on how humans perceive the world, through exposure to Caribbean scholarship, policy and political history, arts and culture, and social media across languages.

4.2.2 COMMUNICATION

Communication skills are developed throughout the program using various multi-media formats including written essays, oral presentations, media analysis and graphs and charts. All core courses include writing components and presentations, and the program offers strong individual support from faculty for all students at all levels. As students progress through the program their expected communication skills become more advanced. Individual and group oral presentations are required components of all second, third and fourth year core courses.

4.2.3 INFORMATION LITERACY

Students in Caribbean Studies develop the ability to retain, deploy and engage critically and effectively with key arguments found in course material in a range of different media. They develop strong skills with regards to governmental policy and media analysis and an ability to grasp the implications and meanings of various forms of reportage in a world where access to news and media are increasingly a part of everyday life. We emphasize critical analytical skills with regards to information that has implications in terms of social justice, particularly race, gender, sexuality, migration, environment, religion and ethnicity, class, economic inequality and
conflict. These skills are developed through a range of assignments that offer students the opportunity to learn to locate, evaluate and cite from material found in libraries and on the internet. The efforts at developing information literacy and communication skills are strongly supported by collaborations with the New College Writing Centre and the New College Library.

4.2.4 QUANTITATIVE REASONING

JQR 360H1: The Canadian Census: Populations, Migrations and Demographics approaches the census as a statistical tool in the context of the ideological project of citizenship and nationalism. It trains students to pose questions and formulate hypotheses using census data and to use the data as evidence in order to apply quantitative reasoning to the social equity emphasis of the program’s other course offerings. This course is shared with a group of other units (Latin American Studies, Diaspora Studies, African Studies and Equity Studies) who share a similar mandate but who bring other geographical or thematic perspectives to the question of how to combine quantitative reasoning with social justice analysis. The interdisciplinary background of Caribbean Studies students, as well as the heterogeneous nature of the programs that share this course, serve to enhance students’ understanding of how different disciplinary, thematic and geographic perspectives shape quantitative thinking and outcomes.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Our program encourages students to see themselves as active agents rather than passive consumers in the production of social transformative ideas and culture. We create an academic environment that fosters social responsibility, a commitment to justice and global awareness, and a sense that our graduates may actively pursue these things in the world, and that these goals are relevant to all career paths. We help students to think integratively, and to be able to see the contemporary and historical connections between the different elements of our complex global society. In other words, we want them to see linkages and possibilities that might be obvious in a different and better world, but which have been obscured in our own by social injustice. Our close collaborations with other units, members of the Caribbean community, and the New College Community Engaged Learning program help students to think ethically about the privileges and responsibilities that come with a university education, and to consider the social and political implications of research and knowledge production.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Please indicate which courses or other appropriate activities, especially in third and fourth year, are eligible means for satisfying this program requirement. The Degree Objectives Guidelines provides both definition and guidelines, with examples of the many types of appropriate courses or other activities.

200- and 300-level courses build the skills in research, analysis and reflection that prepare students for the more sophisticated requirements of independent research at the 400-level. Students are prepared for a major research paper, presentations and seminar-style discussion and participation. A Specialist in Caribbean Studies requires at least one full course equivalent at the 400-level.

All 3rd and 4th year courses require major research papers that draw on all of the key themes of the course, but which require students to synthesize and integrate that material in their own way. Some require presentations of the research that goes into the paper, and this verbal communication of the ideas is tied to the ability to communicate them in writing. One course (NEW428H) has students make a film synthesizing theory and practice, requiring students to integrate the course material with their own independent research, based on documents, media analysis and their own critical reflection drawing from the course materials. The seminar format of the 4th year courses supports students with the process of developing their own themes for their integrative research activities.

A limited number of students also have the opportunity to do independent research courses as a
program elective option.

PART II – Internal Information for Governance

Please fill in spaces with your own words. Expand boxes as needed. Refer to the Checklist to make sure you are filling all sections relevant to the type of proposal.

5. Rationale and Background Information

Please provide any additional information that would be of relevance to the committees reviewing the proposal. This may include a more detailed rationale, related to the unit’s priorities or the institutional plans, as well as information concerning the motivations behind the design, redesign, or creation of the program.

Note: If this is a Specialist program with greater than 14 FCEs, please give the explicit rationale in terms of the multi-unit training necessary.

When the Program was established 20 years ago there were very few courses that examined the Caribbean at U of T. This has transformed dramatically and the program has been going through changes designed to reflect the presence of more specialized knowledge and courses and the developing teaching capabilities of the program’s now more experienced and senior instructors. We have moved rapidly from an era not long ago when there were only a few courses that tried to teach everything relevant to the Caribbean to much greater capacity in terms of breadth, depth and specialization. The specialist program allows students to take full advantage of these opportunities to access Caribbean-focused courses, or courses with significant Caribbean content that are offered through other units.

The addition of a required 100 level course reflects the need to attract students earlier and to provide interdisciplinary information about the Caribbean at a more basic level. The program needs to bridge the steep learning curve for students between what they might have learned in high school about the Caribbean, and the program requirements at the 200 level, which not all students are ready for at the beginning of their university careers. The new 100-level course also expands the range of courses available to first year students generally. We aim to enhance the Interdisciplinary learning pathways in the program, as well as the Language, Arts and Culture pathway. NEW222Y has long existed as both an H and a Y course but it now becomes an option for the 200 level requirement. Students continue to be required to complete at least one FCE at the 400 level. In keeping with the suggestions made in the 2012 External Review, we aim to foster renewal as well as increased coherency and diversity of course offerings. Greater coherency and diversity will enhance enrolment and enhance the intellectual value of the Specialist Program as an option for students.

These enhancements of interdisciplinarity and of breadth, depth and specialization contribute to New College’s priorities to encourage interdisciplinarity and to advance teaching and scholarship that centres social justice, equity, anti-racism and activism, and community-engaged learning.

6. Summary of Changes (required for Minor Changes and Major Modifications A)

Please summarize how the proposed program differs from the program as it currently appears in the Calendar. List the changes that have been made to your current program for all the categories below. (If no change was done, please indicate none.)

- Learning Objectives:

At present, there are two entry-level courses at the 200 level among which students must choose one: NEW224Y emphasizes ‘Thought’ and interdisciplinary perspectives while HIS294Y provides a historical survey. In order to give new students more access to the opportunity to
learn about the Caribbean at a level that is appropriate for them, we are adding a required 100 level course to serve two functions: first, it introduces students to the interdisciplinary study of the Caribbean at a much earlier stage, and therefore is an appropriate building block for NEW224Y and the program’s interdisciplinary pathway. Second, it ensures that all students, even those who choose to take more disciplinary or thematic specializations rather than an interdisciplinary approach, start out with a broad introduction to Caribbean Studies across the disciplines. This helps students to make more informed future courses choices as they navigate their way along the program’s pathways.

We propose to expand NEW222H1 to a Y course, in order to further enhance the interdisciplinary pathways. All three 200 level courses take a pan-Caribbean and pan-linguistic perspective, but NEW222Y does so from the disciplinary perspective of Language and Comparative Literature. This introduces students to Caribbean literature, which has been a fundamental field in the emergence of the modern study of the Caribbean. English, French and Spanish literatures of the Caribbean are taught in the departments of English, French and Spanish and Portuguese, but this is a unique opportunity for students to study literatures from the Caribbean’s multiple linguistic zones in one course. The rigorous integration of comparative literature into the Program’s core courses ensures that Specialists will emerge from the Caribbean Studies Program with a strong foundation in the Caribbean’s many literary traditions.

- Modes of Delivery:
  No change.

- Changes in Program Requirements:
  - Introduction of a new required 100 level course.
  - NEW222Y is reweighted from an ‘H’ to a Y course and becomes an option for the 200 level requirement. One FCE from among NEW222Y, NEW224Y and HIS294Y is required.

- Addition of SPA486H and HIS474H as core courses rather than Group A courses.

- New Courses:
  NEW1XXY1: Introduction to Caribbean Studies.
  NEW4XXH1: Caribbean Diaspora in Canada

- Deleted Courses:

7. Departmental/College Resource Implications

Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.

| Estimated enrolment per academic year in this program (please explain) | Total enrolment estimate is 80. Enrolments figures have been fairly consistent over the last several years, ranging between 65-80 students. It is anticipated that the renewal of the program will push the numbers up to the upper range of our usual figures. |
| New courses necessary to mount for this program | NEW 1XXY1 |
| Additional instructor requirements | Up to another 1.5 FCE instructorship may be required in order to make NEW222H1 a Y course and to introduce NEW 1XXY1. This could be covered through sessional hirings. NEW4XXH1 The Caribbean Diaspora in Canada will alternate with NEW324H1 and requires no additional resources. |
increases the program's points of positive intersection with other units such as English, Spanish and Portuguese, and French.

We have been granted medium priority access to HIS474H and SPA486H, which is not expected to cause enrolment pressure. This access was requested by the instructors of these courses, who both felt strongly that the presence of Caribbean Studies students in the classroom greatly enriched the learning environment for all.

These changes increase the number of points of dialogue between Caribbean Studies and other units. Other examples of courses which already do this are JLN327H and JHN323H, which are jointly offered with Latin American Studies and with History respectively.

9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

Impact on Students and Student Accommodation

Please outline the expected impact on continuing students and how they will be accommodated.

Students already in the program will continue to be subject to the requirements that were in existence the year that they enrolled, and there is therefore no expected impact on continuing students, other than that they continue to benefit from the innovations and increases in the program’s course offerings. More ‘H’ courses have been brought into existence in recent years in order to support the new emphasis on ‘learning pathways’ and increase the number of points of dialogue between Caribbean Studies and other units. Examples: JLN327H and JHN323H are jointly offered with Latin American Studies and with History.
10. For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)

**Need and Demand**

*Please provide a brief description of the need and demand for the proposed program (e.g., student interest, social need, employment opportunities, interest expressed by professional associations or government agencies).*

N/A

11. For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)

**Assessment of Learning**

*Please describe how the methods for assessing student achievements are appropriate and effective relative to the Degree Objectives and Learning Outcomes.*

N/A
Academic Unit: School of Public Policy & Governance

PROGRAM PROPOSAL FORM
Modifications to Major/Specialist

Department/Unit: School of Public Policy & Governance  Program: Undergraduate Major in Public Policy

Underline the appropriate category among the following four:
Existing program with no changes going through re-approval.
Existing program with minor changes.
Major Modification A (existing program showing significant changes to the Learning Outcomes, creation/deletion of Streams, the modes of delivery or the program requirements, such as required service learning.)

Major Modification B (newly-created program where a Major/Specialist with the same designation already exists)

PART I – Calendar Entry

Please fill in spaces with your own words. Expand boxes as needed.

1. Description

Solving real-world policy challenges requires the use of multi-disciplinary tools to analyze problems, determine the best means to deal with those problems, and decide on the best course of action. An undergraduate Major in Public Policy provides a unique opportunity for students in Social Science disciplines to think in an interdisciplinary way, by drawing on theories and approaches, as well as tool kits, developed in the core disciplines of Economics, Public Policy, Political Science, and beyond. Students in this program develop theoretical and applied reasoning skills in policy analysis, as well as a solid grounding in quantitative methods and research.

The Major program in Public Policy is offered jointly by the School of Public Policy, the Department of Economics, and the Department of Political Science. Students enroll after first-year, and must meet the prerequisite conditions for all second-year and higher courses.

Major in Public Policy (7.5 FCEs)

First Year:
1. POL 101Y (a high grade in the Pearson or Margaret Macmillan streams can be considered equivalent. This will be evaluated on a case-by-case basis)
2 Either
   • ECO 100Y, with a minimum grade of 67%
   • ECO 105Y, with a minimum grade of 80%

Second Year:
1. ECO 200Y/ECO204Y/ECO206Y/PPG 200H
2. ECO 220Y1/POL 242Y1/SOC 202H1/STA 107H/STA 220H1/STA 221H1/STA 247H1/STA 248H1/STA 250H1/STA 255H1/STA 257H1/STA 261H1
3. POL 214Y

Third and Fourth Years:
1. PPG 301H
2. PPG 401H
3. Remaining FCEs to reach the 7.5 requirement will be drawn from 300+-level drawn from Economics, Political Science, Sociology, or related disciplines.

A non-exhaustive list of eligible courses includes:

/433H/434H/435H

POL 306H/POL 308H/POL 312Y/POL 314Y/POL 315H/POL 316Y/POL 317Y/POL 318H/POL
364H/POL 370H/POL 371H/POL 377H/POL 408H/POL 409H/POL 411H/POL 413H/JPJ 412H/POL
423H/POL 425Y/POL 439H/POL 447Y/POL 448H/POL 450H/JPF 455Y/JPR 457H/POL 457Y/POL
458H/POL 474H/POL 480Y/POL 481Y/POL 482H

With the approval of the program director, students can take public policy oriented courses outside this list.

It is expected that a mark of 67 % in ECO 100Y, or 80% in ECO 105Y, and a mark of 80% in POL101Y will be required for admission in the coming cycle. Achieving that mark does not necessarily guarantee admission to the program in any given year.

2. Academic Context

The program in Public Policy is designed to provide students with interdisciplinary training in the broad field of public policy. First, it is designed to provide students with the core analytic skills from Economics and Political Science that can be applied to a wide range of public policy issues. Second, with this foundation, students exploit the advantages of specific courses in public policy, taught by faculty from SPPG. The summative course is a 4th -year seminar course where students can draw upon their specific training to explore “The Role of Government” from both an academic and professional perspective. The program provides excellent professional preparation for employment in public service, as well as in the private and not-for-profit sectors, but just as importantly, provides solid academic preparation for further studies in business, law, economics, political science, education, health, and public policy itself. Furthermore, the program is designed to be combined with majors from other disciplines (e.g., economics, political science, commerce, geography, sociology).

3. Learning Outcomes

Students will learn how to critically evaluate government policies in a wide variety of spheres:

1. In first two years, students learn the core methodological tools: (1) Basic economic analysis, especially a solid foundation in microeconomics; (2) Core methods of inquiry in political science, with an emphasis on the operation of government, both theoretical and institutional; and (3) Empirical quantitative skills in order to evaluate evidence on public policy options.

2. In the final two years, students apply these skills to general and specific problems of public policy. In PPG301H, students learn about the policy process, while in PPG401H, students apply their skills to specific questions of public policy, with the organizing question of what the appropriate response of government is to a particular issue, if, indeed, a government response is required. In addition to the PPG courses, students take further courses in economics, political science, or sociology to deepen their understanding of at least one important specific policy area.

3. Students are expected to be able to bring a multi-disciplinary and multi-dimensional set of analytic tools to the analysis of general and specific public policy questions. Students will be able to synthesize empirical evidence on related public policies, and with careful use of economic and political science reasoning, evaluate the pros and cons of specific policy proposals. This understanding includes an appreciation of the political and economic constraints relevant for the implementation of public policy, going beyond the abstract analysis of the impact of an idealized policy.

4. Degree Objectives
4.1 DEPTH OF KNOWLEDGE

Rigorous evaluation of public policy challenges, that is, the evaluation of the appropriate response of government, NGOs, and the business community to economic, political, or social problems, requires analysis from multiple perspectives. In order to evaluate a policy, as a starting point the policy-maker needs to understand the problem being addressed. This requires an understanding of primary tools of social science research, and the strong foundation in Political Science and Economics is designed to provide these skills. Indeed, the program is designed so that students can choose to specialize even further in either discipline, by taking Political Science or Economics as a second Major, and moving to the frontier of that discipline. But comprehensive evaluation of public policy requires more than a single approach, and more than an understanding of the underlying problem prompting a policy response. Policy makers need to understand the political and organizational constraints associated with the design and implementation of what may otherwise seem to be straightforward policies. They also need to understand details of institutional constraints associated with the operation of bureaucracies, and government in general. They need to understand the broader political-economic forces at play (e.g., lobbying, special interest groups, and voters more generally). They need to understand the economic and budgetary consequences of a course of action, including the anticipation of unintended consequences that may arise from behavioural responses of firms and individuals. And they need to be able to evaluate the evidence of whether the policy worked, or has worked elsewhere.

Skills developed in the study of Economics and Political Science are clearly helpful, but they are insufficient. These skills need to be applied to both the general problem of “public policy”, as well as many specific examples. The two courses in public policy are designed to bring students to exactly this point. PPG 301H introduces students to the multidisciplinary study of public policy and the policy process, while PPG 401H addresses head on the role of government. In PPG 401H, students learn how to think about questions of whether government responses are desirable or feasible, and then apply the analytic tools to specific problems in areas as diverse as health care, education, redistribution, the environment, and financial regulation (to list but a few examples). In addition, majors in Public Policy will have at least two courses that provide integrative, inquiry-based activities (PPG301H and PPG401H).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

The foundation of the program is the core courses in Economics, Public Policy, and Political Science. The requirement to have courses from at least three disciplines with very different approaches and methodologies will force students to be intellectually nimble. In the fourth year capstone course (required of all students), students use these skills and methods of analysis to “think outside the box” of these disciplines and use their analytic tools to conduct applied policy reasoning and analysis. For example, for many public policy problems, the solutions posed by economics and political science will differ, and in some cases contradict one another. Students will need to identify common ground, and feasible solutions that integrate across multiple disciplines. The whole premise of the program is to develop these critical and creative skills through multidisciplinary training.

4.2.2 COMMUNICATION

The Political Science and Public Policy courses are writing-based courses and require significant elements of written work. POL101Y and POL214Y each have significant essay assignments, helping students to develop their written communication skills, while the fourth-year capstone course offers students the opportunity to cultivate verbal presentation skills in a seminar setting.

4.2.3 INFORMATION LITERACY

As part of the Political Science and Public policy courses, students will be expected to write research papers, making full use of library and related resources. In the required course ECO 220 Quantitative Methods (or equivalent), students also obtain hands on experience with Microsoft EXCEL, and use it to analyze real-world economic data. They also learn where to find such data, as well as how to use it. In addition students will learn to identify what forms of evidence (experimental, quasi-experimental, descriptive) provide causal inference to policy problems and what forms of evidence are inappropriate to
use as a basis for policy decision making.

4.2.4 QUANTITATIVE REASONING

The economics courses provide a solid foundation of quantitative reasoning, covering calculus, applied mathematical and graphical reasoning, as well as probability and statistics.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

All three elements of the program – Economics, Political Science, and Public Policy – focus on how society can best make choices to maximize social well-being, subject to a long list of constraints and considerations. While different methodologies are employed, a major strength of the program is that students learn the different approaches, and apply them to "real world" problems. The focus on these core questions are especially developed in the two mandatory public policy courses, PPG 301H and PPG 401H. In addition, questions of ethics are introduced in POL 101 (required of all students), which is designed to introduce students to questions of democracy, justice, and ethics.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Majors in Public Policy will have at least two courses that provide integrative, inquiry-based activities. First, in PPG301H, they will be required to draw on their previous economics and political science training to study the interaction of these methods as applied to general questions of public policy. While lecture-based, this course will require significant written work. Those assignments require students to integrate materials from multiple disciplines. Second, PPG401H on the role of government exploit both economics and political scientific approaches to the general question of “the role of government”, with students analyzing specific topics in greater detail in a small-class setting that allows students to build on what they have learned throughout their program and to apply that knowledge in an advanced way.

## PART II – Internal Information for Governance

Please fill in spaces with your own words. Expand boxes as needed. Refer to the Checklist to make sure you are filling all sections relevant to the type of proposal.

### 5. Rationale and Background Information

As part of the academic planning process within the Faculty of Arts and Science, the School of Public Policy and Governance along with the Departments of Economics and Political Science have committed to offering undergraduate students opportunities to participate in a multi-disciplinary study of public policy. This major will complement existing majors in most social science departments. This major program offers students an opportunity to explore the types of issues frequently encountered in a career in public service, to prepare in a comprehensive way for post-graduate work in public policy, and the opportunity to be exposed to the broader policy community through the programming offered through SPPG outside the classroom.

### 6. Summary of Changes (required for Minor Changes and Major Modifications A)

- Learning Objectives:
  This program is a joint program in Public Policy, Political Science, and Economics with a rigorous and robust curriculum. The learning objectives include (1) Basic economic analysis, especially a solid foundation in microeconomics; (2) Core methods of inquiry in political science, with an emphasis on the operation of government, both theoretical and institutional; and (3) Empirical quantitative skills in order to evaluate evidence on public policy options. The changes allow students more choice in order to fulfill these objectives.

Students will be able to apply these skills to specific problems and develop a multi-disciplinary and multi-dimensional set of analytic tools.
• Modes of Delivery:
The mode of delivery has not changed.

• Changes in Program Requirements:
Consultations with faculty and students revealed that the MAT prerequisite was a barrier for otherwise qualified students to enter into the program. The changes in admission requirements will make the program more accessible to students who are highly qualified, but don’t have formal training in math or statistics. The changes in the second year requirements will also make the quantitative content more accessible to students. PPG 200 will provide training in economics and policy analysis required for the major and will not have a MAT course as a prerequisite. Through consultations with faculty, the changes in program requirements also reflect better coordination with other units. These changes allow students from the TrinOne and VicOne policy streams to pursue their public policy interests more directly by taking the major.

• New Courses:
The changes will add one new course: PPG 200: Microeconomic Analysis for Public Policy. This course will provide training in economics and policy analysis required for the major and will not have a MAT course as a prerequisite.

• Deleted Courses:
Consultations with faculty and students revealed that the MAT prerequisite was a barrier for otherwise qualified students to enter into the program. Therefore the MAT prerequisite has been removed.

7. Departmental/College Resource Implications

Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.

<table>
<thead>
<tr>
<th>Estimated enrolment per academic year in this program (please explain)</th>
<th>Target enrolment for the first cohort of students is around 25-50 students. The program can easily accommodate 100+ students in the first two years, as students take courses in existing large-enrolment sections. The third and fourth year courses will be smaller (e.g., 50 students per section of the third-year course, and 25 students per section of the fourth-year course). We expect the program to be popular, and resource permitting, if we can offer enough sections of the 4th course, we expect long-run enrolment of 100 students per year.</th>
</tr>
</thead>
<tbody>
<tr>
<td>New courses necessary to mount for this program</td>
<td>One new course is required: PPG 200H: Microeconomics for Policy Analysis</td>
</tr>
<tr>
<td>Additional instructor requirements</td>
<td>Mark Stabile will teach this course.</td>
</tr>
<tr>
<td>Teaching assistant requirements</td>
<td>N/A</td>
</tr>
<tr>
<td>Laboratory equipment requirements</td>
<td>N/A</td>
</tr>
<tr>
<td>Computing resource requirements</td>
<td>N/A</td>
</tr>
<tr>
<td>Libraries resource requirements</td>
<td>N/A</td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
</tr>
</tbody>
</table>

DELETE the statement that DOES NOT apply:

I will provide these resources required for this program from my existing budget.
**PART III – Additional Information for Major Modifications only**

Please fill in spaces with your own words. Expand boxes as needed.
Refer to the Checklist to make sure you are filling all sections relevant to the type of proposal.

<table>
<thead>
<tr>
<th>8. Impact on your Units or Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please describe the <strong>impact on your unit’s</strong> program of study and any impact on <strong>other programs or units</strong>. If you list a course or courses offered by another units in your program you must provide a letter from the head of that unit stating that students in your program will be included amongst those with priority enrolment access (in cases where there are enrolment controls).</td>
</tr>
</tbody>
</table>

More university of Toronto graduates in Public Policy may be interested in pursuing Masters of Public Policy

<table>
<thead>
<tr>
<th>9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact on Students and Student Accommodation</strong></td>
</tr>
<tr>
<td>Please outline the <strong>expected impact on continuing students</strong> and how they will be accommodated.</td>
</tr>
</tbody>
</table>

Students admitted after the changes are made will fulfill the new curriculum requirements. All students admitted before these changes will fulfill the previous curriculum requirements.

<table>
<thead>
<tr>
<th>10. For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Need and Demand</strong></td>
</tr>
<tr>
<td>Please provide a brief description of the <strong>need and demand</strong> for the proposed program (e.g., student interest, social need, employment opportunities, interest expressed by professional associations or government agencies).</td>
</tr>
</tbody>
</table>

N/A

<table>
<thead>
<tr>
<th>11. For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment of Learning</strong></td>
</tr>
<tr>
<td>Please describe <strong>how the methods for assessing student achievements are appropriate and effective</strong> relative to the Degree Objectives and Learning Outcomes.</td>
</tr>
</tbody>
</table>

N/A
PROGRAM PROPOSAL FORM
Modifications to Major/Specialist

Department/Unit: Earth Sciences
Program: Earth and Environmental Systems

Underline the appropriate category among the following four:
Existing program with no changes going through re-approval.
Existing program with minor changes.
Major Modification A (existing program showing significant changes to the Learning Outcomes, creation/deletion of Streams, the modes of delivery or the program requirements, such as required service learning, )
Major Modification B (newly-created program where a Major/Specialist with the same designation already exists)

PART I – Calendar Entry

Please fill in spaces with your own words. Expand boxes as needed.

1. Description

Provide an EXACT PROGRAM DESCRIPTION, as it is to appear in the Calendar, starting with a general description of the field of study, and including all required courses and recommended electives, and Streams if any. You should particularly indicate which courses are required in first year (maximum 3FCEs), and the courses required at the 300- and 400-levels. Note that the Calendar description should include some of what you include under Learning Outcomes.

The following is the complete description of our departmental programs in the calendar. The section pertaining to the proposed new program is bolded.

Do you like sciences but have a hard time choosing which one to pursue? Can you picture yourself performing experiments in a lab, or collecting data in the field, or developing and testing models on a computer? Then Earth Sciences is the discipline for you. It is the study of physical, chemical, and biological processes over a wide range of temporal and spatial scales in earth and planetary systems. Our department offers various programs:

The three specialist programs – Geology, Environmental Geoscience, and Geophysics (offered in collaboration with the Department of Physics) – give students the skills to enter graduate studies and also allows them to become professional “geoscientists in training” after graduation. The Geology specialist program focuses on processes of the solid planetary bodies, including volcanoes, sedimentary environments, mountain building, the formation of minerals or ores, and Earth through time. The Environmental Geosciences specialist program in addition addresses processes related to groundwater and biochemical activities. The Geophysics specialist program allows students to model physical processes in and on Earth and other planets and to apply non-invasive methods of imaging the subsurface, often in 4D (i.e., space and time); targets may range from archaeological investigations to groundwater imaging and mineral exploration, but also include modeling of mountain-building processes and planetary magnetic fields.

The Geoscience Major program builds on a set of core courses and allows students to select elective courses that match their particular interests. Students have paired this program not just with other science programs but such diverse fields as geography, archaeology, economics, history, political science, or peace and conflict studies.

The Geoscience Minor program provides an introduction to Earth science topics and thinking.

The new major called “Earth and Environmental Systems” takes a holistic approach to understanding how the Earth system works and how it has evolved over tens to millions and billions of years. This requires understanding the dynamics and interactions of all aspects of the system (solid Earth, ocean, atmosphere, and biosphere) and provides the larger context at a time when climate change, resource consumption and global pollution weigh heavily on people and societies.
Our programs emphasise hands-on lab and field work. At least one field course is required in each program, and several courses have offered optional one-day to two-week long trips. In recent years courses have travelled to Newfoundland, Texas, Arizona, Hawaii, Chile, and New Zealand, and small groups of undergraduates have been involved with field research in Turkey, Peru, Greece and South Africa. These field training opportunities foster the establishment of peer networks, develop team-working skills, afford hands-on learning, and allow for a close collaboration and mentoring experience between individual students and instructors. Students are also encouraged to take advantage of extra and co-curricular opportunities such as study abroad, summer abroad, internships, or working in industry and non-governmental organizations.

More information (including an undergraduate handbook) can be found on the department website www.es.utoronto.ca. Students are encouraged to discuss their plans for program and course selection with the Undergraduate Associate Chair (undergradchair@es.utoronto.ca).

**Earth and Environmental Systems Major program:**

This program has unlimited enrolment and no specific admission requirements. All students who have completed at least 4.0 courses are eligible to enroll.

(8 full courses or their equivalent including at least 2.0 FCE at 300+ series with at least 0.5 FCE at 400 level series.)

*note: course titles are included in this version, will be removed for calendar entry*

**Foundation science courses:**

2.0 FCE selected from ESS1xxH, BIO120H, BIO130H, CHM138H, CHM139H, PHY131H, PHY132H, MAT135H

**Core courses:**

1.0 FCE at 200 level:
ESS261H Earth System Evolution  
ESS262H Earth System Processes  

NOTE: ESS261H and ES262H may be taken in either order, and both are required for advanced courses.

1.0 FCE at 300 level:
ESS345H Computational Geology  
One half course from ESS362H Oceanography (new course) OR ESS361H Introduction to Biometeorology (new course code and title) OR GGR305H Biogeography

0.5 FCE field course: ESS410H Field Techniques in Hydrogeochemistry OR ESS450H Geophysical Field Techniques OR GGR390H1 Field Methods in Physical Geography

0.5 FCE capstone course: ESS462H Global Biogeochemical Cycles (new course code) OR ESS461H Paleoenvironmental Studies OR ESS463H Contaminants in the Environment (new course)

3.0 FCE elective courses

The following clusters of courses are neither mutually exclusive nor meant to limit choice but intended to show logical course complements. These are not POST requirements; rather the clusters are presented to aid students in course selection according to their interests.

a) Earth Surface Processes
ESS241H Geological Structures and Maps, ESS311H Aqueous Geochemistry, ESS331H Sedimentation and Stratigraphy, ESS445H Global Tectonics, GGR201H Geomorphology, GGR205H Geomorphology, GGR272H Geographical Information and Mapping I

b) Paleoclimate
ESS331H Sedimentation and Stratigraphy, ESS361H Biosphere-Atmosphere Interactions (new course code), ESS362H Oceanography (new course), ESS461H Paleoenvironmental Studies, ENV234H Environmental Biology, GGR305H Biogeography
c) Biogeochemistry
ENV233H Earth System Chemistry, ESS311H Aqueous Geochemistry, ESS312H Hydrogeology, ESS362H Oceanography (new course), ESS410H Field Techniques in Hydrogeochemistry, ESS462H Global Biogeochemical Cycles (new course code)

d) Global Environmental Change
ESS362H Oceanography (new course), ESS462H Global Biogeochemical Cycles (new course code), ESS463H Contaminants (new course), GGR203H Introduction to Climatology, GGR314H Global Warming

e) Quarternary Science
ANT314H Archaeology of the Pacific Northwest, ANT315H Arctic Archaeology, ANT409H Archaeology of Landscapes, ANT419H Current Debates in Palaeolithic Archaeology

f) Other Relevant Courses
JGA305H Environmental and Archaeological Geophysics, ESS450H Geophysical Field Techniques, GGR337H Environmental Remote Sensing, JEE337H Human Interactions with the Environment, JSC301H Principles and Practices in Science Education, ESS399 Research Excursion, ESS491H/492Y Undergraduate Thesis Project

2. Academic Context

Please outline the elements of the context that explain the reasons why this program exists or should exist and why it is designed this way, from the students’ point of view. These could include the relation of the program to the discipline and/or the students’ interests and academic needs. This section may include useful information on possible career paths.

We are proposing to change the existing Environmental Geosciences major and minor programs into a new “Earth and Environmental Systems” major program. There is a longstanding use of this name in the department dating from the establishment in 2007 of the Canada Research Chair in Isotopes of the Earth and the Environment. This Tier I Chair has just been renewed for a second seven-year term.

The Earth system is a complex collection of feedbacks and interactions between the solid Earth, the atmosphere, the hydrosphere, and the biosphere. “Earth and Environmental Systems” is the study of those interactions over a variety of temporal and spatial scales. “Earth and Environmental Systems” particularly provides the distinct contribution of incorporating planetary time scales from deep in Earth history to the “Anthropocene”, or current time period in which humans have altered biogeochemical processes. This perspective is important because to understand the present and future we need to understand the past, and conversely, to understand the past we must understand the present. “Earth and Environmental Systems” also incorporates spatial scales that extend from local to regional to planetary, and even beyond to our solar and extra-solar systems – providing an approach that is based on comparison and contrast of driving forces and mechanisms. Hence the major distinctions between our proposed new program and the existing programs in the School of the Environment centre on scale, both temporal and spatial, and the principle of comparative studies on those scales to understand driving mechanisms and processes. The main distinction of the the new “Earth and Environmental Systems” beyond scale is also that this program focuses on the natural workings of our planet with a smaller, but still important, focus on human perturbations. This makes this new program a powerful addition the School of the Environment and a great possible double major with Environmental Science. At its core, Environmental Science is primarily concerned with the scientific analysis of, and development of creative solutions for, current environmental problems due to human activities; it focuses on understanding how environmental changes have arisen, how they may interact to create synergistic effects, and how we may mitigate or adapt to these changes. On the other hand, Earth and Environmental System Science is rooted in the fundamental feedback processes that make up our Earth and solar system, assessing natural trends over many time scales including billions to millions to thousands of years...Some examples of these kinds of interactions include changes in ocean chemistry arising from plate-tectonics that initiated biological evolutionary change in the geologic past; communities of fossils and the rocks they are found in can tell us about climatic conditions at the time they were active and about planetary habitability and the
origin and evolution of life; mountain-building processes are now understood to be influenced by both solid Earth processes and by changes in climate. Departmental expertise in paleoclimate, the oceans, and the biogeoosciences will allow the key themes of the proposed program to be taught at an exceptional level. It is here that we anticipate a synergy between our proposed new program and those currently offered by the School of the Environment. Whereas environmental science largely evaluates the effects of human activities on the Earth's processes, our proposed program offers the long-term perspective needed to separate natural variation from that propagated by humans. To anticipate and mitigate unanticipated changes to the Earth and Environmental System, people trained in processes that span the full range of spatio-temporal scales in the Earth and Environmental Sciences are needed.

3. Learning Outcomes

Please give a detailed description of the Learning Outcomes of this program, including those which are in the Calendar description. They should include the goals concerning the disciplinary or interdisciplinary knowledge, understanding of relevant methodologies, and the skills students will have acquired on completion of the program; and, if not clear from the Program Description, the way these outcomes are achieved as students progress through the program (so that students are aware of what they should have accomplished by the end of each year). Specific learning outcomes should be described for each Stream.

The Learning Outcomes over the four years of the proposed BSc Major program in Earth and Environmental Systems are listed below.

(1) to provide a fundamental understanding of underlying scientific concepts of Earth and Environment Systems, incorporating the essential contextual approach inherent in the broadest spectrum of spatial and temporal scales of investigation. Using an interdisciplinary approach to the study of the Earth, students will learn to incorporate methods and theory from the chemical, physical, geological, geographical and biological sciences and to bring their contextual understanding of spatial and temporal scales to a comparative discovery of interactive processes occurring between components of the Earth System,

(2) to build both a qualitative and quantitative knowledge about the large-scale processes and mechanisms that occur within and amongst the components of the Earth System at a variety of timescales, with particular emphases on biogeochemistry, paleoenvironments, solid Earth processes and the waters and ocean cycles,

(3) to develop a solid methodological framework for understanding the Earth System through a combination of laboratory and field-based investigative techniques,

(4) to encourage assessment, synthesis, problem solving and communication of driving mechanisms and interactive processes as they occur on and shape the Earth.

4. Degree Objectives

Means by which students will satisfy the following Degree Objectives (with reference to the Degree Objectives Guidelines). For each objective, please be specific and show how each of the objectives will be achieved within the program in a way that would apply to all students enrolled, whichever courses they choose among elective courses.

We have defined a series of core courses that will form the basis of the Major program in Earth and Environmental Systems. The progression through the courses will teach students to assess the context of natural processes throughout the Earth’s history at the widest range of scales including local to regional to planetary and at the time spans of a years and decades to those relevant to the solar and extra-solar system. Developing such a contextual quantitative and comparative approach is essential given the complexities facing scientists of today and tomorrow.

4.1 DEPTH OF KNOWLEDGE

Please state how particular courses, course sequences and Streams in your program achieve depth (as
Depth of knowledge is facilitated in all four years of the proposed program, where students will learn fundamental processes in the biological, physical, and chemical sciences in their first year of study. Second year courses (ESS261H1, ESS262H1) focus on interactions between Earth’s major systems and the spatial and temporal scale of driving mechanisms, processes, feedbacks and impacts on the Earth and Environment. Third and fourth year core courses ensure continued gathering of information and specialized investigation, including modeling and other problem solving methods, into the sub-components of the Earth system.

4.2 COMPETENCIES

*Please describe how each of the following Competencies* (as defined in the Degree Objectives Guidelines) *is developed within the program to the degree relevant to the area/discipline.*

For each Competency, please be specific and show how each of the objectives will be achieved within the program in a way that would apply to all students enrolled, whichever courses they choose among elective courses or whichever Stream their select.

If a Competency cannot be satisfied within your course offerings, include courses from other units that students can use to fulfil that Competency.

4.2.1 CRITICAL AND CREATIVE THINKING

Because of the “systems” approach taken in this program, all courses inherently teach critical and creative thinking. The compulsory second-year courses focus on interactions between subcomponents of the Earth system and how these have evolved over time and respond, rather than an investigation of these components individually. A methods course required in third year (ESS345H1) will quantify examples of such interactions and provide students with tools to describe them. A set of fourth-year experiential courses (ESS461H, ESS462H, ESS463H) will require that students use the knowledge gained in their first three years of study to begin solving real-world problems in team environments. These courses will show students how multi-faceted problems require creativity along several lines of investigation, and also highlight team-based and multi-disciplinary approaches to critical thinking.

4.2.2 COMMUNICATION

As soon as students enter the program, they will be required to hone their communication skills. ESS261H asks students to give an oral presentation and summarize a publication from a scientific journal. In ESS345H students work in teams, write reports, and become involved in peer review of a project that combines mathematical concepts with earth science questions and computer modelling. The topical fourth year courses (ESS461H, ESS462H, ESS463H) are rooted in scientific communications and designed to hone both written and oral communication skills. Students will be required to give oral presentations, provide critical assessment of peer presentations, and use creativity in public outreach through the development of proposals for new feature television programs or museum-based public exhibitions, and create summaries of recent findings in the scientific literature on the Department of Earth Sciences web page. Any one of the field courses (ESS410H, ESS450H, GGR390H) requires students to work together in a field setting, collect data, analyze it, and synthesize their findings in a report.

4.2.3 INFORMATION LITERACY

Students will be required to use various sources of information for the completion of laboratories, problem sets or written assignments. The scientific literature will form the fundamental basis for resource sources, however data from governmental agencies and not-for-profit organizations may also be required to complete aspects of student assignments. A significant method for conveying information in earth sciences is through geospatial data and maps. Students will become familiar with various aspects of analysis of geospatial data, producing and reading maps (e.g., GGR201H, ESS261H, ESS345H, ESS461H, ESS462H, ESS463H).

4.2.4 QUANTITATIVE REASONING
The program’s core courses have been designed to provide the basic tools for quantitative reasoning in student assignments, problem sets, and quantitative questions on term tests or final exams. These elements are also incorporated into many of the electives (e.g., ESS241H, ENV233H, ESS311H). Several courses have a significant field component where students collect and analyze data (e.g., ESS410H, ESS450H, ESS461H). Quantitative reasoning also includes modeling – i.e., the mathematical description of interactions and processes to understand data – which is the prime learning objective in ESS345H.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Students in the Earth and Environmental Systems program will obtain training in the ethical implications of their future work, which may encompass a wide range of career paths. For example, an explanation of climate change includes fossil fuel burning as well as sinks for carbon which may turn into sources; an honest assessment of data and one’s own limitations in obtaining such data is crucial. Mining activities require environmental assessment and monitoring which will be taught in the proposed program; in addition most mining in Canada is done within or close to aboriginal communities. Some field work requires applications for research permits and access to private land; often field work is conducted within or close to First Nations communities. Thus, through their participation in field work, students will learn to navigate these important considerations. Additionally, through a strong emphasis on information literacy and academic integrity, students will be exposed to the need for sound judgment in the evaluation of scientific data and interpretation. Therefore discussions of ethical dilemmas, values, and responsibilities are weaved throughout the proposed program.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Please indicate which courses or other appropriate activities, especially in third and fourth year, are eligible means for satisfying this program requirement. The Degree Objectives Guidelines provides both definition and guidelines, with examples of the many types of appropriate courses or other activities.

Several courses include inquiry: ESS345H and ESS445H provide students with data sets that they have to explain using modeling and mathematical concepts. The program requires students to earn credit in a fourth-year course (ESS461H, ESS462H, ESS463H), in which assignments will involve collecting, analyzing, writing up, and presenting research findings.

PART II – Internal Information for Governance

Please fill in spaces with your own words. Expand boxes as needed.
Refer to the Checklist to make sure you are filling all sections relevant to the type of proposal.

5. Rationale and Background Information

Please provide any additional information that would be of relevance to the committees reviewing the proposal. This may include a more detailed rationale, related to the unit’s priorities or the institutional plans, as well as information concerning the motivations behind the design, redesign, or creation of the program.

Note: If this is a Specialist program with greater than 14 FCEs, please give the explicit rationale in terms of the multi-unit training necessary.

The creation of the new Department of Earth Sciences and the addition of 3.5 FTE faculty from Physical Geography in 2012 allows the opportunity to redevelop the Major program in Environmental Geoscience which has suffered from low student enrollment over past years. Over the past 6 years we modernized our Geology and Geophysics programs, resulting in a two-fold increase in student enrollment (currently about 150 students). In contrast, the enrollment to the Environmental Geoscience programs has remained constant over the same period of time (on average 15 POSs per year). We believe low enrollment in the Environmental Geoscience major and minor program does not necessarily relate to low student interest, but rather reflects the way the program has been presented to students, including the mix of courses that make up the program. Therefore, we are proposing a new program, Earth and Environmental Systems, which offers a greater range of courses reflecting the teaching interests and expertise of our new faculty members. This is consistent with the Department’s commitment to this field
and the establishment in 2007 of the Canada Research Chair Tier I in Isotopes of the Earth and Environment. The new program is much more easily distinguished from the Geoscience major because of the new breadth of courses in Earth and Environmental Systems relative to the Environmental Geoscience major. Thus with this new proposal, the Department of Earth Sciences will streamline its undergraduate programs to offer two clearly distinct major programs in addition to the three specialist programs (geared towards students intending to become registered geoscience professionals) and one minor program.

Furthermore, following a 3-year transition period, the new Earth Sciences faculty members from Physical Geography will begin teaching in Department of Earth Sciences in September 2015. The addition of these faculty members represents a significant broadening of the academic expertise and teaching interests of the faculty members in the Department of Earth Sciences. As such, an important opportunity exists to launch a new, integrative and broad-reaching program to reflect the breadth of the newly created department. The existing Geology/Geoscience and Geophysics programs are both tied closely to study of the solid Earth, are well staffed by existing faculty members and do not offer an opportunity to capitalize on the new expertise in the Department of Earth Sciences. Thus, we propose here a new program, Earth and Environmental Systems, which will be staffed by both new and existing faculty members, and we believe will raise the profile of the Department of Earth Sciences, and significantly enhance its ability to attract students.

While there are several other programs across the University of Toronto's three campuses touching on Earth and environmental systems, (e.g., Environmental Science, Environmental Biology, Environmental Chemistry, Physical and Environmental Geography), our program is unique in several key ways. The proposed program will at its core address the science of the Earth from a systems perspective throughout Earth history and include complex driving mechanisms, feedbacks and interactions between seemingly disparate components of the Earth system over a variety of timescales and throughout the full spectrum of spatial scales from more local and regional, to planetary and even solar and extra-solar system processes. In addition, the program has several unique foci and specializations, including the paleosciences, biogeoosciences and the oceans. All of these specialties are highly relevant to understanding modern-day perturbations to the Earth's systems. This kind of interdisciplinary perspective is needed in industry, academia, and public life to address mounting environmental challenges posed by climate change, waste management, resource exploration, and resource depletion (e.g., safe drinking water). As just one example, the United Nations’ Nobel-prize winning Intergovernmental Panel on Climate Change (IPCC) is testament to the growing need for people capable of understanding and effectively communicating complex climate-driven consequences of anthropogenic disturbances to the natural Earth and environmental system.

6. Summary of Changes (required for Minor Changes and Major Modifications A)

Please summarize how the proposed program differs from the program as it currently appears in the Calendar. List the changes that have been made to your current program for all the categories below. (If no change was done, please indicate none.)

The proposed program replaces the Environmental Geoscience Major and Minor programs (we are retaining the Environmental Geoscience Specialist program for those students who wish to register as a professional geoscientist in that field). We want to encourage students to look for other meaningful combinations of subjects and hence extend the interdisciplinary collaboration of our group. We are closing the Environmental Geoscience Minor program because it can be achieved by students choosing to take any of the new courses. The following summarizes the improvements which will result from the adoption of the proposed Earth and Environmental Systems major, and cancellation of the Environmental Geoscience major and minor programs:

- Learning Objectives:

The LOs are now more distinct from the Geoscience Major and reflect the broader interests of the faculty members who have recently joined the Department of Earth Sciences.

- Modes of Delivery:
There are more inquiry-based learning opportunities (field work, lab work, data analysis, modeling), and the more direct emphasis on interconnections in the Earth and Environmental System promotes cross-disciplinary learning and critical thinking.

- Changes in Program Requirements:

The required courses are significantly different (Minerals and Rocks, Petrology, Geologic Structures and Maps are no longer required courses in the 2nd year)

- New Courses:

(Again, this is facilitated by the transfer of 3.5 FTE from Geography to Earth Sciences).

ESS262H Earth System Processes

Processes acting within the Earth system at long and short timescales. Examples are erosion rates and cycling of elements, the influence of the biosphere on Earth system, or the effect of climate on tectonic processes. Interactions between geosphere, biosphere, hydrosphere, and atmosphere over short and recent timescales. (Compare to ESS261 – Existing course – which considers the evolution of the Earth system over time, including patterns of evolution and extinction as recorded in the rock record.)

ESS362H Oceanography

An introduction to the physical, geological, chemical, and biological processes governing the world’s oceans. The course emphasizes critical thinking, environmental issues, and interrelationships among scientific disciplines.

ESS463H Contaminants in the Environment

Disturbances to the Earth system by anthropogenic contaminant input and how to improve environmental quality. Case studies include mining contamination and remediation, and movement of contaminants in air, water, soils, and sediments, particularly in urban areas.

- Deleted Courses:

none

### 7. Departmental/College Resource Implications

Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.

<table>
<thead>
<tr>
<th>Estimated enrolment per academic year in this program (please explain)</th>
<th>We believe that we can galvanize student interest, which is evident in strong enrollments in several courses currently offered, in a more focused and holistic program in Earth and Environmental Systems. We anticipate initial enrollment in our new program to be somewhere between 30 and 50 students (i.e. ~40 students), with the potential to increase enrollment as the program is promoted within the University of Toronto and within local secondary schools.</th>
</tr>
</thead>
</table>
| New courses necessary to mount for this program | ESS262H Earth System Processes
ESS362H Oceanography
ESS463H Contaminants in the Environment |
<p>| Additional instructor requirements | None. We are capitalizing on the 3.5 new faculty members who have recently joined the department from Geography. This proposed program is our first effort to make use of that new complement to launch a new program in our areas of expertise, designed to draw larger student numbers. |
| Teaching assistant requirements | Lab and field components |
| Laboratory equipment requirements | We can use existing lab space and existing field equipment (some of which was funded by a joint Geography – Geology SEF grant in |</p>
<table>
<thead>
<tr>
<th><strong>Computing resource requirements</strong></th>
<th>We have received recent faculty grants for teaching infrastructure which will support the proposed new program (&quot;3-D visualization classroom&quot; CRIF fund; &quot;Online modules to enhance active learning in Earth Sciences&quot; ATLAS grant)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Libraries resource requirements</strong></td>
<td>Students will make use of Noranda Earth Sciences library and Geospatial data sources in the Map Library.</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>n/a</td>
</tr>
</tbody>
</table>

DELETE the statement that DOES NOT apply:

I will provide these resources required for this program from my existing budget.

I have received decanal approval for the additional resources required for this program. (Please send documentation.)

DATE | Name of Chair/Program Director
PART III – Additional Information for Major Modifications only

Please fill in spaces with your own words. Expand boxes as needed. Refer to the Checklist to make sure you are filling all sections relevant to the type of proposal.

8. Impact on your Units or Others

Please describe the impact on your unit’s program of study and any impact on other programs or units. If you list a course or courses offered by another units in your program you must provide a letter from the head of that unit stating that students in your program will be included amongst those with priority enrolment access (in cases where there are enrolment controls).

The FAS Environmental Working Group met in spring 2012 to discuss how the School of the Environment should be structured and what programs it should offer. A decision was made to set up the School as an umbrella organization and a new Environmental Science major program would be created that would provide avenues for broad interdisciplinary thinking in co-taught courses involving all cognate departments. The program would be of broad interest to students, offer good pairing with other science majors – including the existing environmental programs in related departments – and highlight the interlinkages between the various sciences and the human impact. It was clear that Earth sciences had to be a strong component of this program. A second science major program, tentatively called Earth Systems, was to be more focussed on the natural and longer time scale Earth systems science aspect, and should at a later time complement the Environmental Science major program. It was felt that this program would have to wait because the Department of Earth Sciences (ES) had just been established and faculty moving from other departments (Geography and Physics) were maintaining their teaching commitments there for a transitional period. This period will finish in summer 2015, and ES is therefore now proposing this new program.

This new program further integrates the Earth and environmental systems topics by merging it with the long-existing major and minor programs in Environmental Geosciences within ES. The proposed program will highlight interactions between Earth Systems (lithosphere, biosphere, hydrosphere, and atmosphere), how these have evolved through 4.5 billion years of Earth history, and how the human impact compares to natural variations. It will draw on the multi-disciplinary expertise of faculty in ES, and intellectually connect with and complement the Environmental Science program. By integrating our existing Environmental Geoscience major and minor programs with the new program, we also streamline our program options for students and optimize our teaching resources in the delivery of our programs.

All core courses, and most on the list of electives, proposed for our Major in Earth and Environmental Systems are taught by faculty in ES. Many of these courses will be taught by new faculty who have recently joined the Department from Physical Geography. Our program is unique at U of T because it integrates the study of various Earth and environmental systems with an emphasis on both driving mechanisms and the feedback mechanisms between the solid Earth, atmosphere, biosphere and hydrosphere over the entire history of the Earth.

The proposed program is distinct from those offered by related Departments such as Physical and Environmental Geography (Geography), Environmental Biology (Ecology and Evolutionary Biology) and Environmental Science (School of the Environment). Differences between the proposed new program in Earth and Environmental Systems and those offered by cognate disciplines are based on (i) our emphasis on cross-disciplinary investigation of interactions and feedbacks between various Earth systems, (ii) the “deep time” perspective (courses draw on examples from 4 billion years of Earth history) and (iii) the particular research and teaching expertise of the faculty in the Department of Earth Sciences (Biogeochemistry, Geobiology, the Deep Biosphere, the Oceans, the Paleosciences, Contaminants).

Since this program proposal emerged in large part because of the addition of 3.5 FTE faculty from Physical Geography, the relationship between it and the existing Physical and Environmental Geography BSc Programs requires special mention. The proposed new program in Earth and Environmental Systems offers strong complementarity with the Physical and Environmental Geography program. All program requirements in the proposed new program can be satisfied with existing or new Earth Sciences courses. Some Geography (GGR) courses are listed as potential electives although there is ample scope for students to take distinct courses and complete a double major in Earth and Environmental Systems,
and Physical and Environmental Geography. The proposed Earth and Environmental Systems program is distinct from the Physical and Environmental Geography program because of the cross-disciplinary core courses offered at second year that have the specific goal of analyzing interactions and feedbacks between components of the Earth System over multiple time scales. The proposed program throughout incorporates a strong geological perspective absent from the Physical and Environmental Geography program, drawing on examples from through the entire length of Earth history. This deep time perspective is unique to the Department of Earth Sciences’ course offerings. Furthermore, the third and fourth year course offerings in the proposed program concentrate primarily on areas of particular strength in the Department of Earth Sciences, including the paleo-sciences, biogeosciences, the oceans and contaminants with a particular interest in the environmental impacts of mining. These are not currently areas of emphasis in Physical and Environmental Geography course offerings. To reflect the ongoing synergies between faculty members in Earth Sciences and Geography, and our ongoing desire to work together, we intend to offer one joint course (GGR100/ESS102). We have also obtained permission from Geography to list some GGR courses as electives for students in Earth and Environmental Systems who have the appropriate pre-requisites. We will also encourage students from Geography programs to enroll in ES courses for which they meet the requirements. One faculty member remains as a shared appointment between Geography and Earth Sciences, and many students share common interests between the two units. The proposed new program will help further develop those interactions.

The proposed program also promotes a stronger link with the School for the Environment and makes the distinction between the Earth Science programs and the Environmental Science BSc program clearer. For example, the revision of the program name from “Environmental Geosciences” to “Earth and Environmental Systems” provides more clarity on the difference between these programs. The term “environmental geoscience” implies a focus on the solid Earth and interactions happening in the present, emphasizing human impact, whereas considering Earth and Environment as a system takes a broader view temporally and spatially without excluding the human element. We consider our revised Earth and Environmental Systems Major POSt to be an excellent complement to the recently created Environmental Science Major POSt; our department contributes significant teaching resources to that program. Our proposed Earth and Environmental Systems Major would allow Environmental Science students to gain more in-depth knowledge on the structure and functioning of various components of Earth and environmental systems in the absence of human impact, and a deeper understanding of the long-term evolution of Earth and environmental systems over deep time. The Environmental Science and Earth and Environmental Systems Major POSts have little overlap in courses, but taken together would provide students with a solid foundation in knowledge and skills to ready them for a variety of careers in the Earth or environmental sciences and also government, policy and education fields.

The proposed program is distinct from Environmental Biology and related EEB programs again because of the broader spatial and temporal perspectives in the proposed Earth and Environmental Systems program. For example, vegetation change is discussed over glacial-interglacial cycles or over the entire period of plant evolution (ESS261H1). Ecological plant physiology is central in Biosphere-Atmosphere Interactions (ESS361H1), but then is integrated over large spatial scales to better inform feedback mechanisms occurring between sub-components of the Earth System. How plants cycle nutrients/elements (carbon, phosphorous, nitrogen or silicon) in Global Biogeochemical Cycles (ESS462H1) is presented on global scales, including cycling in both terrestrial and marine ecosystems. Many of the Environmental Sciences courses focus on one forcing agent, humans, whereas Earth and Environmental Systems courses treat anthropogenic disturbance as one of many forcing agents that affects the interconnected components of Earth and environmental systems.

9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

Impact on Students and Student Accommodation

Please outline the expected impact on continuing students and how they will be accommodated.

Students currently enrolled in the Environmental Geosciences major and minor programs will be able to graduate as we are not eliminating any courses. They also have the option of switching into the existing Geoscience major or minor programs. Students starting in any these programs in the current 2014-15 academic year will be briefed on the revisions so they may start planning early.
10. **For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)**

**Need and Demand**

Please provide a brief description of the need and demand for the proposed program (e.g., student interest, social need, employment opportunities, interest expressed by professional associations or government agencies).

n/a

11. **For Major Modification B only (i.e., newly-created program where a Major/Specialist with the same designation currently exists)**

**Assessment of Learning**

Please describe how the methods for assessing student achievements are appropriate and effective relative to the Degree Objectives and Learning Outcomes.

n/a

Please submit parts I, II (and III). Do not include pages i-iii in your submission.
PROGRAM PROPOSAL FORM for 2015-2016 CALENDAR
Modifications to Major/Specialist

Department/Unit: Human Biology Program
Program: General & Applied Genetics Major
Major Modification A (existing program)

PART I – Calendar Entry

1. Description

Advances in medicine, agriculture and biodiversity conservation are due, in large measure, to an improved understanding of genetics. While these advances have already dramatically benefitted humanity, our understanding of genetics continues to evolve and this influences the development of innovative applications, for example in biotechnology, that impact our society.

The objective of the General & Applied Genetics Major program is to provide students with a solid foundation in the multidisciplinary field of genetics and to facilitate the integration of concepts from across the life sciences, social sciences and humanities. In addition, students will gain experience with quantitative approaches, and develop effective communication skills to provide an appropriate background essential to research and problem solving in this field.

Enrolment in the General & Applied Genetics Major program is limited. Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 2L program (see the Arts & Science Subject POSt Enrolment instructions for details). Students are required to complete 8.0 FCE for the program.

Year 1: Fundamental Life Science

1. Required 2.5 FCE in the following core science courses:

   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1

   Note: Each course of these 2.5 FCE must have a final mark of at least 60% to be eligible. Achieving the minimum marks does not guarantee admission to the program.

Year 2: Foundations in genetics and its applications

2. Required 3.0 FCE from core introductory courses that enable the study of genetics:

   - HMB201H1, HMB265H1/BIO260H1, BCH210H1, BIO220H1, BIO230H1/BIO255H1, STA220H1/PSY201H1/HMB325H1

Year 3: Selected topics in genetics with greater depth and self-directed learning

3. Required 1.5 FCE from depth courses on selected topics in molecular genetics and its applications:

   - HMB301H1/HMB306H1/HMB321H1/HMB342H1/HMB360H1/BCH311H1/CB3349H1/P5L350H1/CB3328H1/CB3311H1/CB340H1/CB352H1/CB351Y1/CB353H1/BCH340H1/EEB318H1/EEB323H1/EEB362H1/EEB375H1/EHJ352H1/MGY377H1/MGY378H1

Year 4: Advanced topics in genetics that emphasize primary research and critical analysis

4. Required 0.5 FCE from courses with advanced topics in applied genetics:

   - HMB401H1/HMB406H1/HMB431H1/HMB435H1/HMB436H1/HMB441H1/HMB449H1/
5. Required 0.5 FCE from courses with advanced topics in fundamental genetics:
   - HMB421H1/BCH425H1/BCH426H1/BCH440H1/BCH445H1/CSB428H1/CSB429H1/
   CSB430H1/CSB452H1/CSB460H1/LMP436H1/ MGY420H1/MGY425H1/MGY428H1/
   MGY434H1/MGY440H1/MGY451H1/MGY452H1/MGY470H1/PCL477H1

2. Academic Context

While advances in the application of genetics has dramatically benefitted human society, there is considerable interest among students and the public at large in understanding how knowledge of genetics influences its application and whether genetic modifications pose a risk to our health and our environment.

The General & Applied Genetics Major program has been revised to emphasize fundamental concepts in genetics and how these concepts influence the application of genetics in society. The field of genetics is multidisciplinary, ranging from genomics and heredity to biodiversity and evolution. The application of genetics is equally diverse, encompassing medical diagnosis and genetic counselling, as well as biotechnology, wild life conservation, and many other areas. The program is designed to provide students with a firm foundation in general and applied genetics through courses in HBP as well as courses that are offered through other departments.

Students graduating with a BSc in the General & Applied Genetics program will be able to communicate effectively with the public, NGOs, private sector, and government on the basic principles of genetics and issues surrounding its application in society. Students will also be able to specialize by pursuing genetic research through graduate studies, further training as a health professional, or pursuing advanced degrees in law, business, or biotechnology.

3. Learning Outcomes

3.1 General learning outcomes:

Students are introduced to their POS in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of applying it to different domains of our everyday lives. They are designed to rigorously challenge students to the level of detail and to think critically about issues of health learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently
includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in a wide range of genetics topics and how these concepts translate into biotechnological and medical applications.
2. Identify, analyze and critically evaluate data from genetic research from the primary literature.
3. Understand and apply appropriate quantitative techniques needed to examine genetics data.
4. Identify and critically evaluate contemporary ethical perspectives on genetics research and its applications.
5. Write and speak effectively about general and applied genetic issues to both scientific and broader audiences.

4. Degree Objectives

4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265 or BIO260) and its applications (HMB201), in particular in biotechnology, and to provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced applied genetics topics in a range of courses, including biotechnology (HMB301), the bioethics of emerging technologies (HMB306), epidemiology (HMB342), and bioinformatics (CSB352). This carries through to 4th year where students can further engage in advanced courses in patents in medicine (HMB401), the biotechnological interface between science and industry (HMB431), computational genomics and bioinformatics (CSB472), and nutrigenomics and personalized nutrition (NFS487). Specialized knowledge in many areas of fundamental genetics is facilitated through depth courses focusing on the structure-function relationship of genes, such as the regulation of gene expression (CSB349, MGY420), epigenetics (CSB458), and the DNA damage response (PCL477), as well as learning a systems perspective of genetics and how it relates to evolution and health, such as molecular evolution and genomics (EEB460), population genetics (EEB459), functional genomics (MGY428), human genetics (MGY470) and regenerative medicine (PSL404).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265 and HMB321 there are weekly tutorial assignments and tests that focus on the application of course concepts and information through problem-based or case-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. These methods are implemented in the context of student-centered learning using a scaffolding approach. In HMB265, students are asked to create a unique pedigree as a way to examine their understanding of the flow of genetic information through generations. As with all life science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical component of the student learning experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources.

4.2.2 COMMUNICATION
Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research grant proposals (HMB421) or learning to transform highly specialized and detailed research findings into an engaging and informative story that is understandable to an informed public (CSB430). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses (HMB321, HMB360, HMB441). Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, etc.) to acquire relevant information from the primary literature and genome databases. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping (HMB265), risk assessment and GWAS analysis (HMB321, HMB342), and estimating allele frequencies, mutation rates and heritability (EEB459), the program also requires that students take basic statistics courses (STA220H1/PSY201H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Several courses will introduce students to some of the bioethical and health policy issues and controversies surrounding specific topics in genetics, including prenatal diagnosis (HMB360), genetic counseling (HMB321, HMB452), ethics in new biotechnologies (HMB306), and health care ethics (HMB406). The overall objective is to offer a variety of courses that challenge the way they think about the benefits of modern genetics, the limits of these benefits, and negative repercussions that genetics applications have on society, including medicine and biotechnology.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of genetics and other life science courses. Students in the Major program are encouraged to complete a 4th year research project course (HMB499), a literature research project course (HMB491), or a summer research project course (HMB496), although this is not a requirement. Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of genetics and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance

5. Rationale and Background Information
The HBP completed a self-study in the spring (March 2014), which identified several major objectives to enhance the overall quality of the program. In addition, an external review of the HBP was completed in the fall (November 2014) and several of the recommendations from that review align with the program changes that were articulated in the self-study. A revision of the subject POSts was among the top priorities for quality enhancement and as a result we re-evaluated each of the courses listed in our calendar with the goal of ensuring that they are listed because of their pedagogical merit rather than historical convenience. During this process, we also carefully considered the HBP’s ability to offer such a large range of subject POSts (12 in total) given the expertise of the unit and our ability to offer rigorous programing through partnerships with other departments. While several POSts have healthy enrolments and are relatively popular with life science students, others were showing signs of declining interest or relatively weak content.

One of the first changes we made was to freeze enrolment in the Health Care Ethics Major in 2014-2015. This was a very small Major (only 11 students total were enrolled in 2013-2014) and program requirements were largely unstructured and insufficient to fully satisfy a Major in this field. Supported by our consultations with the University College Health Studies Program and the Department of Philosophy, we plan to have the Health Care Ethics Major formally closed by next year when the remaining students (4) should have fulfilled their requirements.

The Dalla Lana School of Public Health has been in consultation with the FAS over the development of a new undergraduate program in public health. This would have significant implications for our current Global Health Major and Specialist programs, as well as our Environment & Health Major and Specialist programs. Given that these discussions are in progress, there is no plan to make any major changes to these POSts for the 2015-2016 academic year. However, there is a need in the short term to evaluate the viability of the Global Health Specialist program, since only 1 student has enrolled in the program in the last two years with a current total of 5 students. In contrast, the Global Health Major currently has 198 students enrolled, suggesting that there is significant interest in this subject, but that this interest is either fulfilled in the context of a double major and/or that the structure of the Specialist program is inadequate. In the coming months we will continue to consult with FAS and Dalla Lana in order to consolidate a plan for the future of the Global Health programs in HBP.

This leads us to the current proposals to revise the Health & Disease, Neuroscience, Genes Genetics & Biotechnology, and Human Biology programs where we have made the most progress. In doing so, we had to be mindful of what students consistently view as the major strengths of our programs: interdisciplinary content and flexible course offerings. The proposed restructuring of each of these POSts attempted to balance these two priorities (with existing courses), but also to ensure that program objectives are clearly defined, that core competencies are addressed, and that human biology research serves as a guiding principle for the renewed framework. We are also making incremental progress in developing new courses to further support these changes.

The revised programs include several improvements and innovations that we believe will contribute to their success, some of which are highlighted here. First, with the exception of the Human Biology Major, which will remain as a Type 1 program, all Majors will be designated as Type 2L in order to improve not only resource management for these programs, but to elevate the overall quality of the student learning environment. Our estimate of the impact of this change suggests that we should expect ~10% reduction in total program enrolment. All Specialist POSts will remain as Type 3. Second, all HBP students regardless of their subject POSt will be required to have introductory genetics and statistics courses to ensure that they have a firm foundation for the diversity of upper year courses that require a basic knowledge in these areas. Third, all Specialist students will be required to complete a senior research project course to further enhance their experience in critical analysis and discovery, and take at least one course in bioethics to promote knowledge translation in an area that is of social significance. Fourth, HBP faculty have made excellent progress in developing new and innovative methods of online content delivery and student interactions, while HBP has been working closely with CSB, EEB and the FAS to expand and modernize lab course offerings for HBP students in the planned renovations of the RW teaching labs. These resources will enhance the quality of the courses and in some cases provide increased course enrolment. Finally, the renewed, and streamlined, framework for each of our POSts will provide an improved guide for student course selection and rationale for fulfilling program objectives.

At various times during this curriculum renewal process we have benefited from the feedback of many colleagues from around the university and we continue this consultation process not only with the LSPC committee, but also with colleagues that have agreed to serve on advisory committees for our program. Once the program
modifications are approved, we will work with these advisors to continually refine the HBP. Moreover, we are in the final stages of revising the HBP website, which will serve as a primary vehicle to broadly promote the new changes to the HBP.

6. Summary of Changes (required for Minor Changes and Major Modifications A)

- Name change from “Genes, Genetics & Biotechnology” to “General & Applied Genetics”
- Clarified learning objectives and will make explicit reference to these objectives in the calendar
- Significant streamlining of course offerings
- Converted program to a Type 2L with minimum course grades for 3.0 FCE in 1st year
- Clarified program requirements and progress through the years
- Many courses are using online tools to enhance the learning experience
- Community engaged learning introduced into 2 courses and others are being planned
- Introductory genetics and statistics is now required
- New Courses: HMB360 (Neurogenomics) and HMB401 (Patents in medicine) were approved last year; new courses on human development and metals in human biology are in progress

7. Departmental/College Resource Implications

Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.

| Estimated enrolment per academic year in this program (please explain) | • Propose to limit enrolment to 125 (current is 116)  
• As a type 2L we have better control, but maintain flexibility  
• There is a trend for declining enrolment over the last 5 years, but the new program organization might stabilize or modestly reverse this trend  
• We hope that the main effect of these changes will be to enhance enrolment in the Specialist  
• Enrolment control with minimum standards will make the program more rigorous and improve management |
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<tbody>
<tr>
<td>New courses necessary to mount for this program</td>
<td>No new courses are necessary for 2015-2016</td>
</tr>
<tr>
<td>Additional instructor requirements</td>
<td>New CLT Lecturer approved by FAS will help to rebalance teaching loads for HBP faculty</td>
</tr>
<tr>
<td>Teaching assistant requirements</td>
<td>Supported by HBP budget</td>
</tr>
<tr>
<td>Laboratory equipment requirements</td>
<td>None</td>
</tr>
<tr>
<td>Computing resource requirements</td>
<td>Current support is adequate</td>
</tr>
<tr>
<td>Libraries resource requirements</td>
<td>Current support is adequate</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

DELETE the statement that DOES NOT apply:
| I will provide these resources required for this program from my existing budget. |
| I have received decanal approval for the additional resources required for this program. (Please send documentation.) |
| DATE: January 5, 2015 | Name of Chair/Program Director: Vince Tropepe |

**PART III – Additional Information for Major Modifications only**

<table>
<thead>
<tr>
<th>8. Impact on your Units or Others</th>
</tr>
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<tbody>
<tr>
<td>As most courses listed in the revised curriculum are currently listed in the HBP calendar, we do not anticipate any major impact on other units to continue to have their courses cross-listed. Nonetheless, there are no HBP records showing that a Course Cross-Listing and Access Agreement has been established between HBP and collaborating units. The plan is to review the cross-listed courses with all partnering units in order to ensure that access agreements are up-to-date. This process has started with 13 units (with others to follow) and will continue over the next several weeks.</td>
</tr>
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</table>

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<thead>
<tr>
<th>9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on Students and Student Accommodation</td>
</tr>
<tr>
<td>Current students will be allowed to complete their program according to the current requirements. New students entering the program in 2015-2016 will follow the revised curriculum.</td>
</tr>
</tbody>
</table>
PROGRAM PROPOSAL FORM for 2015-2016 CALENDAR
Modifications to Major/Specialist

Department/Unit:  Human Biology Program  Program: General & Applied Genetics Specialist
Major Modification A (existing program)

PART I – Calendar Entry

1. Description

Advances in medicine, agriculture and biodiversity conservation are due, in large measure, to an improved understanding of genetics. While these advances have already dramatically benefitted humanity, our understanding of genetics continues to evolve and this influences the development of innovative applications, for example in biotechnology, that impact our society.

The objective of the General & Applied Genetics Specialist program is to provide students with a solid foundation in the multidisciplinary field of genetics and to facilitate the integration of concepts from across the life sciences, social sciences and humanities. In addition, students will acquire skills in laboratory science, experience with quantitative approaches, and develop effective communication skills to provide an appropriate background essential to research and problem solving in this field.

Enrolment in the General & Applied Genetics Specialist program is limited. Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 3 program (see the Arts & Science Subject POSt Enrolment instructions for details). Students are required to complete 14.0 FCE for the program.

Year 1: Fundamental Life Science

1. Required 2.5 FCE in the following core science courses:
   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1

Note: Each course of these 2.5 FCE must have a final mark of at least 60%, and students must have an average on the 2.5 FCE of at least 70% to be eligible. Achieving the minimum marks does not guarantee admission to the program.

Year 2: Foundations in genetics and its applications

2. Required 3.0 FCE from core introductory courses that enable the study of genetics:
   - HMB201H1, HMB265H1/BIO260H1, BCH210H1, BIO220H1, BIO230H1/BIO255H1, STA220H1/PSY201H1/HMB325H1

3. Required 0.5 FCE from bioethics courses:
   - PHL281H1/HMB306H1

Year 3: Selected topics in genetics with greater depth and self-directed learning

4. Required 1.5 FCE from depth courses on selected topics in molecular genetics and its applications:
   - HMB301H1, HMB321H1, BCH311H1/CSB349H1/PSL350H1

5. Required 0.5 FCE from courses that will enable the development of skills in laboratory science:
2. Academic Context

While advances in the application of genetics has dramatically benefitted human society, there is considerable interest among students and the public at large in understanding how knowledge of genetics influences its application and whether genetic modifications pose a risk to our health and our environment.

The General & Applied Genetics Specialist program has been revised to emphasize fundamental concepts in genetics and how these concepts influence the application of genetics in society. The field of genetics is multidisciplinary, ranging from genomics and heredity to biodiversity and evolution. The application of genetics is equally diverse, encompassing medical diagnosis and genetic counselling, as well as biotechnology, wild life conservation, and many other areas. The program is designed to provide students with a firm foundation in general and applied genetics through courses in HBP as well as courses that are offered through other departments.

Students graduating with a BSc in the General & Applied Genetics program will be able to communicate effectively with the public, NGOs, private sector, and government on the basic principles of genetics and issues surrounding its application in society. Students will also be able to specialize by pursuing genetic research through graduate studies, further training as a health professional, or pursuing advanced degrees in law, business, or biotechnology.

3. Learning Outcomes

3.1 General learning outcomes:

Students are introduced to their POSt in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of
applying it to different domains of our everyday lives. They are designed to be rigorous with respect to the level of detail and challenging with respect to how student learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in a wide range of genetics topics and how these concepts translate into biotechnological and medical applications.
2. Identify, analyze and critically evaluate data from genetic research from the primary literature.
3. Acquire basic laboratory skills in the life sciences.
4. Understand and apply appropriate quantitative techniques needed to examine genetics data.
5. Identify and critically evaluate contemporary ethical perspectives on genetics research and its applications.
6. Gain research experience in genetics through the collection, analysis and interpretation of scientific data.
7. Write and speak effectively about general and applied genetic issues to both scientific and broader audiences.

4. Degree Objectives

4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265 or BIO260) and its applications (HMB201), in particular in biotechnology, and to provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced applied genetics topics in a range of courses, including biotechnology (HMB301), the bioethics of emerging technologies (HMB306), epidemiology (HMB342), and bioinformatics (CSB352). This carries through to 4th year where students can further engage in advanced courses in patients in medicine (HMB401), the biotechnological interface between science and industry (HMB431), computational genomics and bioinformatics (CSB472), and nutrigenomics and personalized nutrition (NFS487). Specialized knowledge in many areas of fundamental genetics is facilitated through depth courses focusing on the structure-function relationship of genes, such as the regulation of gene expression...
(CSB349, MGY420), epigenetics (CSB458), and the DNA damage response (PCL477), as well as learning a systems perspective of genetics and how it relates to evolution and health, such as molecular evolution and genomics (EEB460), population genetics (EEB459), functional genomics (MGY428), human genetics (MGY470) and regenerative medicine (PSL404).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265 and HMB321 there are weekly tutorial assignments and tests that focus on the application of course concepts and information through problem-based or case-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. These methods are implemented in the context of student-centered learning using a scaffolding approach. In HMB265, students are asked to create a unique pedigree as a way to examine their understanding of the flow of genetic information through generations. As with all life science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical component of the student learning experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources.

4.2.2 COMMUNICATION

Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research grant proposals (HMB421) or learning to transform highly specialized and detailed research findings into an engaging and informative story that is understandable to an informed public (CSB430). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses (HMB321, HMB360, HMB441). Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, etc.) to acquire relevant information from the primary literature and genome databases. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping (HMB265), risk assessment and GWAS analysis (HMB321, HMB342), and estimating allele frequencies, mutation rates and heritability (EEB459), the program also requires that students take basic statistics courses (STA220H1/PSY201H1 and STA221H1/PSY202H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses. Students are also required to complete one 3rd year laboratory course and one 4th year research project course, which provides consecutive opportunities to gain first hand experience acquiring and analyzing quantitative data.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Several courses will introduce students to some of the bioethical and health policy issues and controversies surrounding specific topics in genetics, including prenatal diagnosis (HMB360), genetic counseling (HMB321, HMB452), and health care ethics (HMB406). The program also requires that students take at least one course on bioethics (PHL283 or HMB306). The overall objective is to challenge students to think about the benefits of modern genetics, the limits of these benefits, and negative repercussions that genetics applications have on
society, including medicine and biotechnology.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of genetics and other life science courses. A hallmark of the Specialist program is the requirement to complete a 4th year research project course (HMB499). Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of genetics and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance

5. Rationale and Background Information

The HBP completed a self-study in the spring (March 2014), which identified several major objectives to enhance the overall quality of the program. In addition, an external review of the HBP was completed in the fall (November 2014) and several of the recommendations from that review align with the program changes that were articulated in the self-study. A revision of the subject POSs was among the top priorities for quality enhancement and as a result we re-evaluated each of the courses listed in our calendar with the goal of ensuring that they are listed because of their pedagogical merit rather than historical convenience. During this process, we also carefully considered the HBP’s ability to offer such a large range of subject POSs (12 in total) given the expertise of the unit and our ability to offer rigorous programing through partnerships with other departments. While several POSs have healthy enrolments and are relatively popular with life science students, others were showing signs of declining interest or relatively weak content.

One of the first changes we made was to freeze enrolment in the Health Care Ethics Major in 2014-2015. This was a very small Major (only 11 students total were enrolled in 2013-2014) and program requirements were largely unstructured and insufficient to fully satisfy a Major in this field. Supported by our consultations with the University College Health Studies Program and the Department of Philosophy, we plan to have the Health Care Ethics Major formally closed by next year when the remaining students (4) should have fulfilled their requirements.

The Dalla Lana School of Public Health has been in consultation with the FAS over the development of a new undergraduate program in public health. This would have significant implications for our current Global Health Major and Specialist programs, as well as our Environment & Health Major and Specialist programs. Given that these discussions are in progress, there is no plan to make any major changes to these POSs for the 2015-2016 academic year. However, there is a need in the short term to evaluate the viability of the Global Health Specialist program, since only 1 student has enrolled in the program in the last two years with a current total of 5 students. In contrast, the Global Health Major currently has 198 students enrolled, suggesting that there is significant interest in this subject, but that this interest is either fulfilled in the context of a double major and/or that the structure of the Specialist program is inadequate. In the coming months we will continue to consult with FAS and Dalla Lana in order to consolidate a plan for the future of the Global Health programs in HBP.

This leads us to the current proposals to revise the Health & Disease, Neuroscience, Genes Genetics & Biotechnology, and Human Biology programs where we have made the most progress. In doing so, we had to be mindful of what students consistently view as the major strengths of our programs: interdisciplinary content and flexible course offerings. The proposed restructuring of each of these POSs attempted to balance these two priorities (with existing courses), but also to ensure that program objectives are clearly defined, that core competencies are addressed, and that human biology research serves as a guiding principle for the renewed framework. We are also making incremental progress in developing new courses to further support these changes.

The revised programs include several improvements and innovations that we believe will contribute to their
success, some of which are highlighted here. First, with the exception of the Human Biology Major, which will remain as a Type 1 program, all Majors will be designated as Type 2L in order to improve not only resource management for these programs, but to elevate the overall quality of the student learning environment. Our estimate of the impact of this change suggests that we should expect ~ 10% reduction in total program enrolment. All Specialist POSts will remain as Type 3. Second, all HBP students regardless of their subject POSt will be required to have introductory genetics and statistics courses to ensure that they have a firm foundation for the diversity of upper year courses that require a basic knowledge in these areas. Third, all Specialist students will be required to complete a senior research project course to further enhance their experience in critical analysis and discovery, and take at least one course in bioethics to promote knowledge translation in an area that is of social significance. Fourth, HBP faculty have made excellent progress in developing new and innovative methods of online content delivery and student interactions, while HBP has been working closely with CSB, EEB and the FAS to expand and modernize lab course offerings for HBP students in the planned renovations of the RW teaching labs. These resources will enhance the quality of the courses and in some cases provide increased course enrolment. Finally, the renewed, and streamlined, framework for each of our POSts will provide an improved guide for student course selection and rationale for fulfilling program objectives.

At various times during this curriculum renewal process we have benefited from the feedback of many colleagues from around the university and we continue this consultation process not only with the LSPC committee, but also with colleagues that have agreed to serve on advisory committees for our program. Once the program modifications are approved, we will work with these advisors to continually refine the HBP. Moreover, we are in the final stages of revising the HBP website, which will serve as a primary vehicle to broadly promote the new changes to the HBP.

6. Summary of Changes (required for Minor Changes and Major Modifications A)

- Name change from “Genes, Genetics & Biotechnology” to “General & Applied Genetics”
- Clarified learning objectives and will make explicit reference to these objectives in the calendar
- Significant streamlining of course offerings
- Clarified program requirements and progress through the years
- Many courses are using online tools to enhance the learning experience
- Community engaged learning introduced into 2 courses and others are being planned
- Introductory genetics and statistics is now required; 4th year research project course is now required
- New Courses: HMB360 (Neurogenomics) and HMB401 (Patents in medicine) were approved last year; new courses on human development and metals in human biology are in progress

7. Departmental/College Resource Implications

Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.

<table>
<thead>
<tr>
<th>Estimated enrolment per academic year in this program (please explain)</th>
<th>Maintain limit to enrolment at 44 (current is 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a trend for declining enrolment over the last 5 years, but the new program organization should reverse this trend</td>
<td></td>
</tr>
<tr>
<td>Limit is based on number of lab spots available; if this increases with the new RW renovation then we can increase this limit</td>
<td></td>
</tr>
</tbody>
</table>

| New courses necessary to mount | No new courses are necessary in 2015-2016 |
### for this program

<table>
<thead>
<tr>
<th>Additional instructor requirements</th>
<th>New CLT Lecturer approved by FAS will help to rebalance teaching loads for HBP faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching assistant requirements</td>
<td>Supported by HBP budget</td>
</tr>
<tr>
<td>Laboratory equipment requirements</td>
<td>Labs currently offered in DTL (Medicine); new labs in RW will require initial OTO support from FAS</td>
</tr>
<tr>
<td>Computing resource requirements</td>
<td>Current support is adequate</td>
</tr>
<tr>
<td>Libraries resource requirements</td>
<td>Current support is adequate</td>
</tr>
</tbody>
</table>

**DELETE the statement that DOES NOT apply:**

- I will provide these resources required for this program from my existing budget.
- I have received decanal approval for the additional resources required for this program. (Please send documentation.)

**DATE:** January 5, 2015  
**Name of Chair/Program Director:** Vince Tropepe

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**PART III – Additional Information for Major Modifications only**

8. **Impact on your Units or Others**

As most courses listed in the revised curriculum are currently listed in the HBP calendar, we do not anticipate any major impact on other units to continue to have their courses cross-listed. Nonetheless, there are no HBP records showing that a Course Cross-Listing and Access Agreement has been established between HBP and collaborating units. The plan is to review the cross-listed courses with all partnering units in order to ensure that access agreements are up-to-date. This process has started with 13 units (with others to follow) and will continue over the next several weeks.

9. **For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)**

   **Impact on Students and Student Accommodation**

Current students will be allowed to complete their program according to the current requirements. New students entering the program in 2015-2016 will follow the revised curriculum.
PART I – Calendar Entry

1. Description

Human Biology is an interdisciplinary field that is concerned with the study of human health from a biological, sociological, and evolutionary perspective. Research in this field focuses on the impact that genetic variations, development, physical fitness, and nutrition have on the general health of populations and how this compares across cultures and through history.

The Human Biology Major program aims to provide an interdisciplinary perspective on the biological and sociological determinants of human health. The objective of the program is to provide students with a solid foundation in the life sciences as it relates to human biology and to facilitate the integration of concepts from across the social sciences and humanities. In addition, students will gain experience with quantitative approaches, and develop effective communication skills to provide an appropriate background essential to research and problem solving in this field.

Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 1 program (see the Arts & Science Subject POS Programme Enrollment instructions for details). Students are required to complete 8.0 FCE for the program.

Year 1: Fundamental Life Science

1. Required 2.5 FCE in the following core science courses:

   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1

2. Recommended 0.5 FCE from the following complementary introductory courses in science, social science, and humanities:

   - PSY100H1/SOC103H1/PHL201H1

Year 2: Foundations in Human Biology

3. Required 2.5 FCE from core introductory courses that enable the study of human biology:

   - HMB204H1, HMB265H1/BIO260H1, BCH210H1, BIO220H1, BIO230H1

Year 3: Selected topics in human biology with greater depth and self-directed learning

4. Required 1.5 FCE from courses that focus on the structure and function of the human body:

   - HMB302H1/ANA300Y1/IMM340H1/IMM350H1/MGY377H1/MGY378H1/CSB351Y1/(PSL300H1, PSL301H1)

5. Required 0.5 FCE from courses that focus on the social, economic and political perspectives of human biology:

   - HMB203H1/HMB303H1/HMB306H1/ANT208H1/NEW335H1/NFS284H1/PHE110H1/PHL281H1/SOC243H1/SOC244H1/SOC246H1/UNI103Y1/UNI209H1/UNI211H1/UNI237H1/
6. Required 0.5 FCE from depth courses related to human biology:

- HMB322H1/HMB323H1/HMB325H1/HMB342H1/ANA301H1/BIO270H1/BCH311H1/BCH340H1/BIO271H1/CSB325H1/CSB345H1/CSB346H1/EEB255H1/EEB318H1/EEB319H1/EEB323H1/EEB324H1/EEB365H1/EEB375H1/IMM350H1/LMP363H1/NFS284H1/NFS382H1/PCL362H1/PSY371H1/PSY372H1

**Year 4: Advanced topics in health and disease that emphasize primary research and critical analysis:**

7. Required 0.5 FCE from courses with advanced, research-driven, and translational topics in health and disease:


### 2. Academic Context

The Human Biology Major program has been revised to emphasize fundamental concepts in human biology. The program takes an interdisciplinary approach that integrates genetics, physiology, psychology and sociology through courses in HBP as well as courses that are offered through other departments and programs.

Students graduating with a BSc in the Human Biology program will be able to communicate effectively with the public, NGOs, private sector, and government on the basic principles of health and disease and issues surrounding its societal implications. Students will also be able to specialize by pursuing research through graduate studies, further training as health care professionals, or pursuing advanced degrees in social work, public policy, business, or law.

### 3. Learning Outcomes

#### 3.1 General learning outcomes:

Students are introduced to their POSt in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of applying it to different domains of our everyday lives. They are designed to be rigorous with respect to the level of detail and challenging with respect to how student learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as
academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in human biology.
2. Identify, analyze and critically evaluate data from human biology research from the primary literature.
3. Understand and apply appropriate quantitative techniques needed to examine human biology related data.
4. Identify and critically evaluate contemporary sociological and ethical perspectives on human biology research.
5. Write and speak effectively about human biology issues to both scientific and broader audiences.

4. Degree Objectives

4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265, BIO260) and other life sciences, human biology (HMB204), medical anthropology (ANT208), health policy (UNI211), and basic nutrition (NFS284). These courses provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced health and disease courses that highlight anatomy and physiology (ANA300, PSL300), histology (HMB302), and the immune system (IMM350). Further depth in these subjects is available at the 3rd year level in courses that focus on endocrine physiology (CSB325), epidemiology (HMB342), or principles of pathobiology (LMP363). Other advanced courses complement these specialized topics by integrating concepts from other fields, such as health care ethics (HMB406), global health and human rights (HMB303), sociology of mental health (SOC363), and the politics of gender and health (WGS367). In 4th year, students can further engage in specialized courses in the genetics of human disease (HMB441), advanced nutrition (NFS484), inflammation and infection (LMP402), and exercise and mental health (HMB473).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265, HMB203, HMB204 there are assignments and tests that focus on the application of course concepts and information through problem-based or case-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. As with all science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical component of the student learning experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources. The program also uses creative ways to facilitate reflective thinking. For example, HMB443 integrates community engaged learning as a primary method for teaching students about micronutrient deficiencies and food security.

4.2.2 COMMUNICATION
Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research grant proposals in translational medicine (HMB402). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses, such as HMB302 where students work in pairs or small groups where students engage in peer learning and evaluation. Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, Allen Brain Atlas, etc.) to acquire relevant information from the primary literature, and genome and gene expression databases. In HMB302, students engage in peer teaching and evaluation facilitated by social media and access to an online image database. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping and allele frequencies in populations (HMB265), or statistically analyzing altered physical parameters due to exercise (HMB471), the program also requires that students take a basic statistics course (STA220H1/PSY201H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Several courses will introduce students to some of the bioethical, social and health policy issues and controversies surrounding specific topics in health and disease, including the sociology of mental health (SOC363), prenatal diagnosis (HMB360), AIDS (JNH350), and health policy in Canada (UNI211). The overall objective is to challenge students to think about the benefits of health and disease research, and the limits of these benefits, on society, including medicine, law and biotechnology.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of health and disease related courses. Students in the Major program are encouraged to complete a 4th year research project course (HMB499), a literature research project course (HMB491), or a summer research project course (HMB496), although this is not a requirement. Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of health and disease and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance

5. Rationale and Background Information

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in the self-study. A revision of the subject POSTs was among the top priorities for quality enhancement and as a result we re-evaluated each of the courses listed in our calendar with the goal of ensuring that they are listed because of their pedagogical merit rather than historical convenience. During this process, we also carefully considered the HBP’s ability to offer such a large range of subject POSTs (12 in total) given the expertise of the unit and our ability to offer rigorous programing through partnerships with other departments. While several POSTs have healthy enrolments and are relatively popular with life science students, others were showing signs of declining interest or relatively weak content.

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This leads us to the current proposals to revise the Health & Disease, Neuroscience, Genes Genetics & Biotechnology, and Human Biology programs where we have made the most progress. In doing so, we had to be mindful of what students consistently view as the major strengths of our programs: interdisciplinary content and flexible course offerings. The proposed restructuring of each of these POSTs attempted to balance these two priorities (with existing courses), but also to ensure that program objectives are clearly defined, that core competencies are addressed, and that human biology research serves as a guiding principle for the renewed framework. We are also making incremental progress in developing new courses to further support these changes.

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6. **Summary of Changes** (required for Minor Changes and Major Modifications A)

- Clarified learning objectives and will make explicit reference to these objectives in the calendar
- Significant streamlining of course offerings
- Clarified program requirements and progress through the years
- Many courses are using online tools to enhance the learning experience
- Community engaged learning introduced into 2 courses and others are being planned
- Introductory genetics and statistics is now required
- New Courses: HMB360 (Neurogenomics) and HMB401 (Patents in medicine) were approved last year; new courses on human development and metals in human biology are in progress
- New course: HMB204 Introduction to Human Biology (presented at last meeting with only minor questions being raised); approval in progress

7. **Departmental/College Resource Implications**

*Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.*

<table>
<thead>
<tr>
<th>Estimated enrolment per academic year in this program (please explain)</th>
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</tr>
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| New courses necessary to mount for this program | • HMB204: Introduction to Human Biology (approval in progress)  
• Course enrolment can be accommodated in several classrooms that can fit ~300-400 students  
• Another option is to offer multiple sections |
| Additional instructor requirements | New CLT Lecturer approved by FAS will help to rebalance teaching loads for HBP faculty |
| Teaching assistant requirements | Supported by HBP budget |
| Laboratory equipment requirements | None |
| Computing resource requirements | Current support is adequate |
| Libraries resource requirements | Current support is adequate |
| Other | |

**DELETE the statement that DOES NOT apply:**

I will provide these resources required for this program from my existing budget.

I have received decanal approval for the additional resources required for this program. (Please send documentation.)

**DATE:** January 5, 2015 **Name of Chair/Program Director:** Vince Tropepe
### 8. Impact on your Units or Others

As most courses listed in the revised curriculum are currently listed in the HBP calendar, we do not anticipate any major impact on other units to continue to have their courses cross-listed. Nonetheless, there are no HBP records showing that a Course Cross-Listing and Access Agreement has been established between HBP and collaborating units. The plan is to review the cross-listed courses with all partnering units in order to ensure that access agreements are up-to-date. This process has started with 13 units (with others to follow) and will continue over the next several weeks.

### 9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

**Impact on Students and Student Accommodation**

Current students will be allowed to complete their program according to the current requirements. New students entering the program in 2015-2016 will follow the revised curriculum.
# PROGRAM PROPOSAL FORM for 2015-2016 CALENDAR

**Modifications to Major/Specialist**

**Department/Unit:** Human Biology Program  
**Program:** Health and Disease Major  
**Major Modification A (existing program)**

## PART I – Calendar Entry

### 1. Description

The Health & Disease Major program aims to provide an interdisciplinary perspective on the biological and sociological determinants of human health. The objective of the program is to provide students with a solid foundation in the biological sciences as it relates to basic human physiology and the mechanisms of disease and to facilitate the integration of concepts from across the life sciences, social sciences and humanities. In addition, students will gain experience with quantitative approaches, and develop effective communication skills to provide an appropriate background essential to research and problem solving in this field.

Enrolment in the Health & Disease Major program is limited. Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 2L program (see the Arts & Science Subject POSt Enrolment instructions for details). Students are required to complete 8.0 FCE for the program.

#### Year 1: Fundamental Life Science

1. Required 2.5 FCE in the following core science courses:
   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1

   **Note:** Each course of these 2.5 FCE must have a final mark of at least 60% to be eligible. Achieving the minimum marks does not guarantee admission to the program.

2. Recommended 0.5 FCE from the following complementary introductory courses in science, social science, and humanities:
   - PSY100H1/SOC103H1/PHL201H1

#### Year 2: Foundations in health and disease

3. Required 2.0 FCE from core introductory courses that enable the study of health and disease:
   - HMB202H1, HMB265H1/BIO260H1, BIO220H1, BIO230H1

#### Year 3: Selected topics in health and disease with greater depth and self-directed learning

4. Required 2.0 FCE from courses that focus on the structure and function of the human body:
   - PSL300H1, PSL301H1, BCH210H1, HMB302H1/IMM340H1/IMM350H1/MGY377H1/MGY378H1/CSB351Y1

5. Required 0.5 FCE from courses that focus on the social, economic and political perspectives of health and disease:
   - HMB203H1/HMB303H1/HMB306H1/ANT208H1/NEW335H1/NFS284H1/PHE110H1/PHL281H1/SOC243H1/SOC244H1/SOC246H1/UNI103Y1/UNI209H1/UNI211H1/UNI237H1/UNI250H1/JNH350H1/SOC309Y1/SOC363H1/WGS367H1/UNI440H1/STA220H1/PSY201H1/
6. Required 0.5 FCE from depth courses in health and disease:
   
   HMB322H1/HMB323H1/HMB325H1/HMB342H1/HAJ453H1/ANA300Y1/BCH311H1/
   BCH340H1/CSB325H1/CSB327H1/CSB345H1/CSB346H1/EEB318H1/EEB319H1/EEB323H1/
   EEB362H1/EEB375H1/PSY397H1/LMP301H1/LMP363H1/NFS284H1/NFS382H1/NFS386H1/
   PCL201H1/PCL302H1/PCL362H1/PSY342H1/PSY371H1/PSY372H1

Year 4: Advanced topics in health and disease that emphasize primary research and critical analysis:

7. Required 0.5 FCE from courses with advanced, research-driven, and translational topics in health and disease:

   - HMB402H1/HMB406H1/HMB422H1/HMB432H1/HMB434H1/HMB436H1/HMB440H1/
     HMB441H1/HMB443H1/HMB452H1/HMB462H1/HMB470H1/HMB471H1/HMB472H1/
     HMB473H1/BCH426H1/BCH445H1/CSB429H1/CSB443H1/CSB458H1/EEB460H1/IMM430H1/
     IMM435H1/LMP402H1/LMP403H1/LMP406H1/LMP410H1/MIJ485H1/PSY445H1/
     MGY470H1/NFS400H1/NFS404H1/NFS420H1/NFS425H1/NFS450H1/NFS460H1/
     NFS482H1/NFS485H1/NFS486H1/NFS487H1/NFS488H1/
     NFS489H1/NFS490H1/PCL473Y1/PSL404H1/PSL420H1/PSL425H1/PSL462H1/
     PSL470H1/PSL472H1/PSY440H1/PSY460H1/PSY470H1/PSY471H1/PSY494H1

2. Academic Context

The Health & Disease Major program has been revised to emphasize fundamental concepts in health and disease and how these concepts have impacted society. The program takes an interdisciplinary approach to the study of health and disease, ranging from human genetics and the mechanisms of disease to nutrition, exercise, and the social determinants of health. The program is designed to provide students with a broad foundation in the study of health of disease through courses in HBP as well as courses that are offered through other departments and programs.

Students graduating with a BSc in the Health & Disease program will be able to communicate effectively with the public, NGOs, private sector, and government on the basic principles of health and disease and issues surrounding its societal implications. Students will also be able to specialize by pursuing health and disease research through graduate studies, further training as health care professionals, or pursuing advanced degrees in social work, public policy, business, or law.

3. Learning Outcomes

3.1 General learning outcomes:

Students are introduced to their POS in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of applying it to different domains of our everyday lives. They are designed to be rigorous with respect to the level of detail and challenging with respect to how student learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our
students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in human health and disease and how these concepts are applied.
2. Identify, analyze and critically evaluate data from health and disease research from the primary literature.
3. Understand and apply appropriate quantitative techniques needed to examine health and disease related data.
4. Identify and critically evaluate contemporary sociological and ethical perspectives on health and disease research.
5. Write and speak effectively about health and disease issues to both scientific and broader audiences.

4. Degree Objectives

4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265, BIO260), health and disease (HMB202, HMB203), as well as biochemistry (BCH210) and molecular cell biology (CSB230), health policy (UNI211), and basic nutrition (NFS284). These courses provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced health and disease courses that highlight anatomy and physiology (ANA300, PSL300), histology (HMB302), and the immune system (IMM350). Further depth in these subjects is available at the 3rd year level in courses that focus on endocrine physiology (CSB325), epidemiology (HMB342), or principles of pathobiology (LMP363). Other advanced courses complement these specialized topics by integrating concepts from other fields, such as health care ethics (HMB406), global health and human rights (HMB303), sociology of mental health (SOC363), and the politics of gender and health (WGS367). In 4th year, students can further engage in specialized courses in the genetics of human disease (HMB441), advanced nutrition (NFS484), inflammation and infection (LMP402), and cardiovascular physiology (PSL470).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265, HMB202, HMB360 there are assignments and tests that focus on the application of course concepts and information through problem-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. As with all life science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical
component of the student learning experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources. The program also uses creative ways to facilitate reflective thinking. For example, HMB443 integrates community engaged learning as a primary method for teaching students about micronutrient deficiencies and food security.

### 4.2.2 COMMUNICATION

Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research grant proposals in translational medicine (HMB402). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses, such as HMB302 where students work in pairs or small groups where students engage in peer learning and evaluation. Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

### 4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, Allen Brain Atlas, etc.) to acquire relevant information from the primary literature, and genome and gene expression databases. In HMB302, students engage in peer teaching and evaluation facilitated by social media and access to an online image database. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

### 4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping (HMB265), or statistically analyzing altered physical parameters due to exercise (HMB471), the program also requires that students take basic statistics courses (STA220H1/PSY201H1 and STA221H1/PSY202H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses.

### 4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Several courses will introduce students to some of the bioethical, social and health policy issues and controversies surrounding specific topics in health and disease, including the sociology of mental health (SOC363), prenatal diagnosis (HMB360), AIDS (JNH350), and health policy in Canada (UNI211). The overall objective is to challenge students to think about the benefits of health and disease research, and the limits of these benefits, on society, including medicine, law and biotechnology.

### 4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of health and disease related courses. Students in the Major program are encouraged to complete a 4th year research project course (HMB499), a literature research project course (HMB491), or a summer research project course (HMB496), although this is not a requirement. Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of health and disease and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance
The HBP completed a self-study in the spring (March 2014), which identified several major objectives to enhance the overall quality of the program. In addition, an external review of the HBP was completed in the fall (November 2014) and several of the recommendations from that review align with the program changes that were articulated in the self-study. A revision of the subject POSs was among the top priorities for quality enhancement and as a result we re-evaluated each of the courses listed in our calendar with the goal of ensuring that they are listed because of their pedagogical merit rather than historical convenience. During this process, we also carefully considered the HBP’s ability to offer such a large range of subject POSs (12 in total) given the expertise of the unit and our ability to offer rigorous programing through partnerships with other departments. While several POSs have healthy enrolments and are relatively popular with life science students, others were showing signs of declining interest or relatively weak content.

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- Significant streamlining of course offerings
- Clarified program requirements and progress through the years
- Many courses are using online tools to enhance the learning experience
- Community engaged learning introduced into 2 courses and others are being planned
- Converted program to a Type 2L with minimum course grades for 3.0 FCE in 1st year
- Introductory genetics and statistics is now required
- New Courses: HMB360 (Neurogenomics) and HMB401 (Patents in medicine) were approved last year; new courses on human development and metals in human biology are in progress

7. Departmental/College Resource Implications

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<tr>
<td></td>
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<td></td>
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</tr>
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I have received decanal approval for the additional resources required for this program. (Please send documentation.)

DATE: January 5, 2015   Name of Chair/Program Director: Vince Tropepe

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PART III – Additional Information for Major Modifications only

8. Impact on your Units or Others

As most courses listed in the revised curriculum are currently listed in the HBP calendar, we do not anticipate any major impact on other units to continue to have their courses cross-listed. Nonetheless, there are no HBP records showing that a Course Cross-Listing and Access Agreement has been established between HBP and collaborating units. The plan is to review the cross-listed courses with all partnering units in order to ensure that access agreements are up-to-date. This process has started with 13 units (with others to follow) and will continue over the next several weeks.

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   Impact on Students and Student Accommodation

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1. Description

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Enrolment in the Health & Disease Specialist program is limited. Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 3 program (see the Arts & Science Subject POSt Enrolment instructions for details). Students are required to complete 14.0 FCE for the program.

Year 1: Fundamental Life Science

1. Required 2.5 FCE in the following core science courses:

   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1

   **Note:** Each course of these 2.5 FCE must have a final mark of at least 60%, and students must have an average on the 2.5 FCE of at least 70% to be eligible. Achieving the minimum marks does not guarantee admission to the program.

2. Recommended 0.5 FCE from the following complementary introductory courses in science, social science, and humanities:

   - PSY100H1/SOC103H1/PHL201H1

Year 2: Foundations in health and disease

3. Required 3.0 FCE from core introductory courses that enable the study of health and disease:

   - HMB202H1, HMB265H1/BIO260H1, BCH210H1, BIO220H1, BIO230H1, STA220H1/PSY201H1/HMB325H1

4. Required 0.5 FCE from bioethics courses:

   - PHL281H1/HMB306H1

Year 3: Selected topics in health and disease with greater depth and self-directed learning

5. Required 2.0 FCE from courses that focus on the structure and function of the human body:

   - PSL300H1, PSL301H1, ANA300Y1/IMM340H1/IMM350H1/MGY377H1/MGY378H1/CSB351Y1

6. Required 1.0 FCE from courses that focus on the social, economic and political perspectives of health and
disease:
- HMB203H1/HMB303H1/ANT208H1/NEW335H1/NFS284H1/PHE110H1/SOC243H1/SOC244H1/
  SOC246H1/UNI103Y1/UNI209H1/UNI211H1/UNI237H1/UNI250H1/JNH350H1/SOC309Y1/
  SOC363H1/WGS367H1/UNI440H1

7. Required 1.5 FCE from depth courses on the molecular biology of cells and tissues
- HMB302H1, BCH311H1/CSB349H1/PSL350H1, CSB327H1, CSB328H1, CSB331H1

8. Required 0.5 FCE from courses that will enable the development of skills in laboratory science:
- HMB312H1/CSB330H1/PSL372H1/BCH370H1

9. Required 1.0 FCE from depth courses in health and disease:
- HMB322H1/HMB323H1/HMB342H1/HMB360H1/ANA300Y1/ANA301H1/BIO270H1/BIO271H1/
  BCh311H1/BCH340H1/CSB325H1/CSB328H1/CSB332H1/CSB343H1/CSB345H1/CSB346H1/
  EEB318H1/EEB319H1/EEB323H1/EEB362H1/EEB375H1/LMP301H1/LMP363H1/NFS284H1/
  NFS382H1/NFS386H1/PCL201H/PCL302H/PCL362H1/PSL304H1/PSL305H1/PSY342H1/PSY371H1/
  PSY397H1

Year 4: Advanced topics in health and disease that emphasize primary research and critical analysis:

10. Required 1.0 FCE from courses with advanced, research-driven, and translational topics in health and disease:
- HMB401H1/HMB402H1/HMB406H1/HMB422H1/HMB432H1/HMB434H1/HMB436H1/
  HMB440H1/HMB441H1/HMB443H1/HMB452H1/HMB462H1/HMB470H1/HMB471H1/
  HMB472H1/HMB473H1/HMB489H1/BCH425H1/BCH426H1/BCH441H1/BCH445H1/
  CSB429H1/CSB443H1/CSB458H1/CSB472H1/EEB428H1/EEB460H1/IMM428H1/IMM429H1/
  IMM430H1/IMM435H1/LMP402H1/LMP403H1/LMP406H1/LMP410H1/LMP415H1/MJ485H1/
  MGY420H1/MGY428H1/MGY445H1/MGY470H1/NFS400H1/NFS484H1/NFS485H1/
  NFS486H1/NFS487H1/NFS488H1/NFS489H1/NFS490H1/PCL473Y1/PSL404H1/
  PSL420H1/PSL421H1/PSL425H1/PSL462H1/PSL470H1/PSL472H1/PSY440H1/
  PSY460H1/PSY470H1/PSY471H1/PSY494H1

11. Required 1.0 FCE undergraduate research project course:
- HMB499Y1

2. Academic Context

The Health & Disease Specialist program has been revised to emphasize fundamental concepts in health and disease and how these concepts have impacted society. The program takes an interdisciplinary approach to the study of health and disease, ranging from human genetics and the mechanisms of disease to nutrition, exercise, and the social determinants of health. The program is designed to provide students with a broad foundation in the study of health of disease through courses in HBP as well as courses that are offered through other departments and programs.

Students graduating with a BSc in the Health & Disease program will be able to communicate effectively with the public, NGOs, private sector, and government on the basic principles of health and disease and issues surrounding its societal implications. Students will also be able to specialize by pursuing health and disease research through graduate studies, further training as health care professionals, or pursuing advanced degrees in social work, public policy, business, or law.
3. Learning Outcomes

3.1 General learning outcomes:

Students are introduced to their POS in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of applying it to different domains of our everyday lives. They are designed to be rigorous with respect to the level of detail and challenging with respect to how student learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in human health and disease and how these concepts are applied.
2. Identify, analyze and critically evaluate data from health and disease research from the primary literature.
3. Acquire basic laboratory skills in the life sciences.
4. Understand and apply appropriate quantitative techniques needed to examine health and disease related data.
5. Identify and critically evaluate contemporary societal and ethical perspectives on health and disease research.
6. Gain research experience in health and disease through the collection, analysis and interpretation of scientific data.
7. Write and speak effectively about health and disease issues to both scientific and broader audiences.

4. Degree Objectives
4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265, BIO260), health and disease (HMB202, HMB203), as well as biochemistry (BCH210) and molecular cell biology (CSB230), health policy (UNI211), and basic nutrition (NFS284). These courses provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced health and disease courses that highlight anatomy and physiology (ANA300, PSL300), histology (HMB302), and the immune system (IMM350). Further depth in these subjects is available at the 3rd year level in courses that focus on endocrine physiology (CSB325), epidemiology (HMB342), or principles of pathobiology (LMP363). Other advanced courses complement these specialized topics by integrating concepts from other fields, such as health care ethics (HMB406), global health and human rights (HMB303), sociology of mental health (SOC363), and the politics of gender and health (WGS367). In 4th year, students can further engage in specialized courses in the genetics of human disease (HMB441), advanced nutrition (NFS484), inflammation and infection (LMP402), and cardiovascular physiology (PSL470).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265, HMB202, HMB360 there are assignments and tests that focus on the application of course concepts and information through problem-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. As with all life science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical component of the student learning experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources. The program also uses creative ways to facilitate reflective thinking. For example, HMB443 integrates community engaged learning as a primary method for teaching students about micronutrient deficiencies and food security.

4.2.2 COMMUNICATION

Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research grant proposals in translational medicine (HMB402). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses, such as HMB302 where students work in pairs or small groups where students engage in peer learning and evaluation. Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, Allen Brain Atlas, etc.) to acquire relevant information from the primary literature, and genome and gene expression databases. In HMB302, students engage in peer teaching and evaluation facilitated by social media and access to an online image database. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping (HMB265), or statistically analyzing altered physical parameters due to exercise (HMB471), the program also requires that students take basic statistics courses (STA220H1/PSY201H1 and STA221H1/PSY202H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses. Students are also required to
complete one 3rd year laboratory course and one 4th year research project course, which provides consecutive opportunities to gain first hand experience acquiring and analyzing quantitative data.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Several courses will introduce students to some of the bioethical, social and health policy issues and controversies surrounding specific topics in health and disease, including the sociology of mental health (SOC363), prenatal diagnosis (HMB360), AIDS (JNH350), and health policy in Canada (UNI211). The overall objective is to challenge students to think about the benefits of health and disease research, and the limits of these benefits, on society, including medicine, law and biotechnology.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of health and disease related courses. A hallmark of the Specialist program is the requirement to complete a 4th year research project course (HMB499). Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of health and disease and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance

5. Rationale and Background Information

The HBP completed a self-study in the spring (March 2014), which identified several major objectives to enhance the overall quality of the program. In addition, an external review of the HBP was completed in the fall (November 2014) and several of the recommendations from that review align with the program changes that were articulated in the self-study. A revision of the subject POSs was among the top priorities for quality enhancement and as a result we re-evaluated each of the courses listed in our calendar with the goal of ensuring that they are listed because of their pedagogical merit rather than historical convenience. During this process, we also carefully considered the HBP’s ability to offer such a large range of subject POSs (12 in total) given the expertise of the unit and our ability to offer rigorous programing through partnerships with other departments. While several POSs have healthy enrolments and are relatively popular with life science students, others were showing signs of declining interest or relatively weak content.

One of the first changes we made was to freeze enrolment in the Health Care Ethics Major in 2014-2015. This was a very small Major (only 11 students total were enrolled in 2013-2014) and program requirements were largely unstructured and insufficient to fully satisfy a Major in this field. Supported by our consultations with the University College Health Studies Program and the Department of Philosophy, we plan to have the Health Care Ethics Major formally closed by next year when the remaining students (4) should have fulfilled their requirements.

The Dalla Lana School of Public Health has been in consultation with the FAS over the development of a new undergraduate program in public health. This would have significant implications for our current Global Health Major and Specialist programs, as well as our Environment & Health Major and Specialist programs. Given that these discussions are in progress, there is no plan to make any major changes to these POSs for the 2015-2016 academic year. However, there is a need in the short term to evaluate the viability of the Global Health Specialist program, since only 1 student has enrolled in the program in the last two years with a current total of 5 students. In contrast, the Global Health Major currently has 198 students enrolled, suggesting that there is significant interest in this subject, but that this interest is either fulfilled in the context of a double major and/or that the structure of the Specialist program is inadequate. In the coming months we will continue to consult with FAS and Dalla Lana in order to consolidate a plan for the future of the Global Health programs in HBP.
This leads us to the current proposals to revise the Health & Disease, Neuroscience, Genes Genetics & Biotechnology, and Human Biology programs where we have made the most progress. In doing so, we had to be mindful of what students consistently view as the major strengths of our programs: interdisciplinary content and flexible course offerings. The proposed restructuring of each of these POSs attempted to balance these two priorities (with existing courses), but also to ensure that program objectives are clearly defined, that core competencies are addressed, and that human biology research serves as a guiding principle for the renewed framework. We are also making incremental progress in developing new courses to further support these changes.

The revised programs include several improvements and innovations that we believe will contribute to their success, some of which are highlighted here. First, with the exception of the Human Biology Major, which will remain as a Type 1 program, all Majors will be designated as Type 2L in order to improve not only resource management for these programs, but to elevate the overall quality of the student learning environment. Our estimate of the impact of this change suggests that we should expect ~10% reduction in total program enrolment. All Specialist POSs will remain as Type 3. Second, all HBP students regardless of their subject POS will be required to have introductory genetics and statistics courses to ensure that they have a firm foundation for the diversity of upper year courses that require a basic knowledge in these areas. Third, all Specialist students will be required to complete a senior research project course to further enhance their experience in critical analysis and discovery, and take at least one course in bioethics to promote knowledge translation in an area that is of social significance. Fourth, HBP faculty have made excellent progress in developing new and innovative methods of online content delivery and student interactions, while HBP has been working closely with CSB, EEB and the FAS to expand and modernize lab course offerings for HBP students in the planned renovations of the RW teaching labs. These resources will enhance the quality of the courses and in some cases provide increased course enrolment. Finally, the renewed, and streamlined, framework for each of our POSs will provide an improved guide for student course selection and rationale for fulfilling program objectives.

At various times during this curriculum renewal process we have benefited from the feedback of many colleagues from around the university and we continue this consultation process not only with the LSPC committee, but also with colleagues that have agreed to serve on advisory committees for our program. Once the program modifications are approved, we will work with these advisors to continually refine the HBP. Moreover, we are in the final stages of revising the HBP website, which will serve as a primary vehicle to broadly promote the new changes to the HBP.

6. **Summary of Changes** *(required for Minor Changes and Major Modifications A)*

- Clarified learning objectives and will make explicit reference to these objectives in the calendar
- Significant streamlining of course offerings
- Clarified program requirements and progress through the years
- Many courses are using online tools to enhance the learning experience
- Community engaged learning introduced into 2 courses and others are being planned
- Introductory genetics and statistics is now required; 4th year research project course is now required
- New Courses: HMB360 (Neurogenomics) and HMB401 (Patents in medicine) were approved last year; new courses on human development and metals in human biology are in progress

7. **Departmental/College Resource Implications**

*Please provide a statement of the resource requirements for the program, and an indication of whether you can meet these requirements through your existing resources, or have received additional resources from the Dean. Please give details for all relevant resource areas below.*

<table>
<thead>
<tr>
<th>Estimated enrolment per academic</th>
<th>Maintain limit to enrolment at 44 (current is 21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New courses necessary to mount for this program</td>
<td>No new courses are necessary for 2015-2016</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Additional instructor requirements</td>
<td>New CLT Lecturer approved by FAS will help to rebalance teaching loads for HBP faculty</td>
</tr>
<tr>
<td>Teaching assistant requirements</td>
<td>Supported by HBP budget</td>
</tr>
<tr>
<td>Laboratory equipment requirements</td>
<td>Labs currently offered in DTL (Medicine); new labs in RW will require initial OTO support from FAS</td>
</tr>
<tr>
<td>Computing resource requirements</td>
<td>Current support is adequate</td>
</tr>
<tr>
<td>Libraries resource requirements</td>
<td>Current support is adequate</td>
</tr>
</tbody>
</table>

DELETE the statement that DOES NOT apply:

- I will provide these resources required for this program from my existing budget.
- I have received decanal approval for the additional resources required for this program. (Please send documentation.)

DATE: January 5, 2015  
Name of Chair/Program Director: Vince Tropepe

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**PART III – Additional Information for Major Modifications only**

8. Impact on your Units or Others

As most courses listed in the revised curriculum are currently listed in the HBP calendar, we do not anticipate any major impact on other units to continue to have their courses cross-listed. Nonetheless, there are no HBP records showing that a Course Cross-Listing and Access Agreement has been established between HBP and collaborating units. The plan is to review the cross-listed courses with all partnering units in order to ensure that access agreements are up-to-date. This process has started with 13 units (with others to follow) and will continue over the next several weeks.

9. For Major Modification A only (i.e., existing program showing significant changes to the Learning Outcomes, the modes of delivery or the program requirements, such as required service learning)

**Impact on Students and Student Accommodation**

Current students will be allowed to complete their program according to the current requirements. New students entering the program in 2015-2016 will follow the revised curriculum.
PART I – Calendar Entry

1. Description

Neuroscience is an interdisciplinary field that aims to understand the brain and nervous system through the integration of research at the molecular, cellular and organismal levels and across various stages of development, maturation, and aging. The translation of neuroscience has important implications for understanding healthy human behaviour and for promoting the development of effective strategies for diagnosing and treating nervous system disorders.

The objective of the Neuroscience Major program is to provide students with a solid foundation in the interdisciplinary field of neuroscience and to facilitate the integration of concepts from across the life sciences, social sciences and humanities. In addition, students will gain experience with quantitative approaches, and develop effective communication skills to provide an appropriate background essential to research and problem solving in this field.

Enrolment in the Neuroscience Major program is limited. Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 2L program (see the Arts & Science Subject POSt Enrolment instructions for details). Students are required to complete 8.0 FCE for the program.

Year 1: Fundamental Life Science

1. Required 2.5 FCE in the following core science courses:
   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1

Note: Each course of these 2.5 FCE must have a final mark of at least 60% to be eligible. Achieving the minimum marks does not guarantee admission to the program.

2. Required 0.5 FCE introductory psychology course:
   - PSY100H1

Year 2: Foundations in neuroscience

3. Required 2.5 FCE from core introductory courses that enable the study of neuroscience:
   - HMB200H1, HMB265H1/BIO260H1, BCH210H1, BIO230H1/BIO255H1, STA220H1/PSY201H1/HMB325H1

Year 3: Selected topics in neuroscience with greater depth and self-directed learning

4. Required 1.5 FCE from courses emphasizing the molecular and cellular basis of brain structure and function:
   - HMB300H1/HMB320H1, CSB332H1, PSL300H1

5. Required 0.5 FCE from depth courses in molecular, cellular and systems neuroscience:
   - HMB360H1/BCH311H1/CSB325H1/CSB328H1/CSB345H1/CSB346H1/
their analytical reasoning and practicing effective communication. etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

3. Learning Outcomes

3.1 General learning outcomes:

Students are introduced to their POS in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of applying it to different domains of our everyday lives. They are designed to be rigorous with respect to the level of detail and challenging with respect to how student learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our
students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in a wide range of neuroscience topics and how these concepts are applied.
2. Identify, analyze and critically evaluate data from neuroscience research from the primary literature.
3. Understand and apply appropriate quantitative techniques needed to examine neuroscience data.
4. Identify and critically evaluate contemporary ethical perspectives on neuroscience research.
5. Write and speak effectively about neuroscience issues to both scientific and broader audiences.

4. Degree Objectives

4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265, BIO260), neurobiology (HMB200, HMB220), and systems neuroscience (PSY260, PSY280), and to provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced neuroscience through courses that highlight the molecular and cellular basis of the structure-function relationship in the brain, such as neurogenomics (HMB360), neuroanatomy (HMB320), and the neurobiology of behaviour (HMB300). Further depth in these subjects is available at the 3rd year level in courses that focus on the neurobiology of the synapse (CSB332), behavioural genetics (PSY390), or human physiology (PSL301). In 4th year, students can further engage in specialized courses in memory and learning (PSY460 and PSY470), neurogenesis (CSB430), cellular neurophysiology (CSB432), and the pathobiology of neurodegenerative disease (LMP410). Other advanced courses complement these specialized topics by integrating concepts from other fields, such as health care ethics (HMB406), exercise and mental health (HMB473), nutritional neurosciences (NFS489), and abnormal psychology (PSY440).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265, HMB300, HMB360 there are assignments and tests that focus on the application of course concepts and information through problem-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. In HMB220, students produce a written “debate” assignment where they are required to research and gather evidence for both sides of a topic, evaluate that evidence and then form conclusions. As with all life science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical component of the student learning
experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources. The program also uses creative ways to facilitate reflective thinking. For example, in HMB471, students engage in a semester-long self-test “lab” to assess the effects of stress control techniques on performance. Moreover, HMB440 integrates community engaged learning as a primary method for teaching students about neurobiology of dementia and its societal implications.

4.2.2 COMMUNICATION

Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research proposals (HMB440) or learning to transform highly specialized and detailed research findings into an engaging and informative story that is understandable to an informed public (CSB430). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses (HMB300, HMB360). Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, Allen Brain Atlas, etc.) to acquire relevant information from the primary literature, and genome and gene expression databases. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping (HMB265), GWAS analysis (HMB360), and statistically analyzing altered physical parameters due to exercise (HMB471), the program also requires that students take basic statistics courses (STA220H1/PSY201H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY

Several courses will introduce students to some of the bioethical, social and health policy issues and controversies surrounding specific topics in neuroscience, including prenatal diagnosis (HMB360), mental health (HMB440), ethics in new biotechnologies (HMB306), and health care ethics (HMB406). Students in HMB220 partner with the Geneva Centre for Autism to promote social awareness. The overall objective is to challenge students to think about the benefits of modern neuroscience, the limits of these benefits, and negative repercussions that neuroscience applications might have on society, including medicine, law and biotechnology.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of neuroscience and other life science courses. Students in the Major program are encouraged to complete a 4th year research project course (HMB499), a literature research project course (HMB491), or a summer research project course (HMB496), although this is not a requirement. Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of neuroscience and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance
5. Rationale and Background Information

The HBP completed a self-study in the spring (March 2014), which identified several major objectives to enhance the overall quality of the program. In addition, an external review of the HBP was completed in the fall (November 2014) and several of the recommendations from that review align with the program changes that were articulated in the self-study. A revision of the subject POSTs was among the top priorities for quality enhancement and as a result we re-evaluated each of the courses listed in our calendar with the goal of ensuring that they are listed because of their pedagogical merit rather than historical convenience. During this process, we also carefully considered the HBP's ability to offer such a large range of subject POSTs (12 in total) given the expertise of the unit and our ability to offer rigorous programing through partnerships with other departments. While several POSTs have healthy enrolments and are relatively popular with life science students, others were showing signs of declining interest or relatively weak content.

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DATE: January 5, 2015  Name of Chair/Program Director: Vince Tropepe

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**PART III – Additional Information for Major Modifications only**

8. **Impact on your Units or Others**

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**Impact on Students and Student Accommodation**

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1. **Description**

Neuroscience is an interdisciplinary field that aims to understand the brain and nervous system through the integration of research at the molecular, cellular and organismal levels and across various stages of development, maturation, and aging. The translation of neuroscience has important implications for understanding healthy human behaviour and for promoting the development of effective strategies for diagnosing and treating nervous system disorders.

The objective of the Neuroscience Specialist program is to provide students with a solid foundation in the interdisciplinary field of neuroscience and to facilitate the integration of concepts from across the life sciences, social sciences and humanities. In addition, students will acquire skills in laboratory science, experience with quantitative approaches, and develop effective communication skills to provide an appropriate background essential to research and problem solving in this field.

Enrolment in the Neuroscience Specialist program is limited. Students apply for admission on the Arts & Science Faculty Registrar’s Office website for a Type 3 program (see the Arts & Science Subject POSt Enrolment instructions for details). Students are required to complete 14.0 FCE for the program.

**Year 1: Fundamental Life Science**

1. Required 2.5 FCE in the following core science courses:
   - BIO120H1, BIO130H1, (CHM138H1, CHM139H1)/CHM151Y1, MAT135H1/PHY131H1/PHY151H1
   
   **Note:** Each course of these 2.5 FCE must have a final mark of at least 60%, and students must have an average on the 2.5 FCE of at least 70% to be eligible. Achieving the minimum marks does not guarantee admission to the program.

2. Required 0.5 FCE introductory psychology course:
   - PSY100H1

**Year 2: Foundations in neuroscience**

3. Required 3.0 FCE from core introductory courses that enable the study of neuroscience:
   - HMB200H1, HMB265H1/BIO260H1, BCH210H1, BIO230H1/BIO255H1, STA220H1/PSY201H1/HMB325H1, PSL300H1

4. Required 0.5 FCE from introductory courses in the field of systems neuroscience:
   - LIN200H1/PSY260H1/PSY270H1/PSY280H1

5. Required 0.5 FCE from bioethics courses:
   - PHL281H1/HMB306H1
Year 3: Selected topics in neuroscience with greater depth and self-directed learning

6. Required 2.0 FCE from courses emphasizing the molecular and cellular basis of brain structure and function:
   - HMB300H1, HMB320H1, CSB332H1, BCH311H1/CSB349H1/PSL350H1

7. Required 0.5 FCE from courses that will enable the development of skills in laboratory science:
   - HMB310H1/CSB330H1/CSB350H1/BCH370H1/PSL372H1

8. Required 1.5 FCE from depth courses in molecular, cellular, and systems neuroscience:
   - HMB360H1/CSB325H1/CSB332H1/CSB345H1/CSB346H1/EHB322H1*/JLP315H1/JLP374H1/PCL201H1/PCL302H1/PSL304H1/PSL305H1/PSL374H1/
     PSY342H1/PSY371H1/PSY372H1/PSY390H1/PSY396H1/PSY397H1

   *Requires EEB220H1 as a prerequisite

Year 4: Advanced topics in neuroscience that emphasize primary research and critical analysis:

9. Required 1.5 FCE from courses with advanced fundamental and translational topics in neuroscience:
   - HMB406H1/HMB420H1/HMB430H1/HMB440H1/HMB471H1/HMB473H1/CSB430H1/CSB443H1/CSB445H1/JLS474H1/JLP471H1/NEW335H1/NFS489H1/LMP410H1/PCL475Y1/
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   *Additional prerequisites are required

10. Required 1.0 FCE undergraduate research project course:
    - HMB499Y1

2. Academic Context

The Neuroscience Specialist program has been revised to emphasize fundamental concepts in neuroscience and how these concepts have impacted society. The field of neuroscience is multidisciplinary, ranging from ion channel function and neurotransmission to neural circuit connectivity and behaviour. The application of neuroscience is equally diverse, encompassing medical diagnosis and treatment, such as brain imaging and stem cell therapy, policies on mental health and sports safety, the pharmaceutical industry, and many other areas. One only has to look as far as recent news media to find articles on “neurolaw” and “neuroeconomics” to appreciate the extent to which neuroscience has penetrated our society. The program is designed to provide students with a firm foundation in neuroscience through courses in HBP as well as courses that are offered through other departments.

Students graduating with a BSc in the Neuroscience program will be able to communicate effectively with the public, NGOs, private sector, and government on the basic principles of neuroscience and issues surrounding its application in society. Students will also be able to specialize by pursuing neuroscience research through graduate studies, further training as a health professional, or pursuing advanced degrees in law, business, or biotechnology.

3. Learning Outcomes

3.1 General learning outcomes:
Students are introduced to their POS in 2nd year with foundational courses designed to provide a broad overview of the subject area. Other introductory courses revolve around subject areas that are integral to all of our programs and that require some additional detailed instruction, such as genetics and statistics. As students progress through their programs to 3rd year, they become increasingly exposed to smaller, specialized courses in their fields. Generally, these courses are designed to focus on specific topics in more detail and to encourage more self-directed and group learning. By building on their fundamental knowledge, these courses examine ways of applying it to different domains of our everyday lives. They are designed to be rigorous with respect to the level of detail and challenging with respect to how student learning is evaluated, whether through writing or online assignments, oral presentations, or short-answer based examinations. A hallmark of the 3rd year in our specialist programs of study is the opportunity to enrol in laboratory courses. Finally, in 4th year students are further engaged to practice their critical thinking by taking specialized seminar-based courses in each of their respective fields. These courses are designed so that students analyse and critically evaluate cutting-edge primary research and present this information in scholarly formats (e.g. formal seminars, grant proposals, literature review articles, etc.). Assignments of this nature give students the opportunity for extensive self-directed learning, sharpening their analytical reasoning and practicing effective communication.

A central objective of the Human Biology Program is to facilitate the development of core competencies in our students, which includes: critical and creative thinking, self-directed learning, quantitative and analytical reasoning, effective communication, scholarship and research. As a result, we aim to prepare our students for future careers where an interdisciplinary education in the biological and health sciences would be an asset, such as academic research and teaching, health professions, and public policy on research, health, education, and the environment.

The Human Biology Program offers diverse experiential learning opportunities for our students, which currently includes international placements in global health and disease, service learning with various organizations in the Toronto community, undergraduate research in various life science laboratories on campus and affiliated hospital research institutes, and focused biological science instruction in laboratory courses.

Our Human Biology faculty are at the cutting edge of teaching innovation by providing technology-enhanced learning tools, new methods for collaborative learning and peer evaluation, and emphasizing critical thinking and effective communication. Our strong academic relationships with other departments at the University are a key component of our interdisciplinary approach to teaching. This approach facilitates engaging the diversity and excellence of scholars in these other units to teach in our courses, or enable our students to have access to other courses that are relevant to their program of study.

3.2 Specific learning outcomes:

By the end of this program, students will be able to:

1. Demonstrate an understanding of the fundamental concepts in a wide range of neuroscience topics and how these concepts are applied.
2. Identify, analyze and critically evaluate data from neuroscience research from the primary literature.
3. Acquire basic laboratory skills in the life sciences.
4. Understand and apply appropriate quantitative techniques needed to examine neuroscience data.
5. Identify and critically evaluate contemporary ethical perspectives on neuroscience research.
6. Gain research experience in neuroscience through the collection, analysis and interpretation of scientific data.
7. Write and speak effectively about neuroscience issues to both scientific and broader audiences.

4. Degree Objectives

4.1 DEPTH OF KNOWLEDGE

Introductory courses are designed to expose students to fundamental concepts in genetics (HMB265, BIO260), neurobiology (HMB200, HMB220), and systems neuroscience (PSY260, PSY280), and to provide a core knowledge base in these areas from which students will build. Starting in 3rd year, students are introduced to more advanced neuroscience through courses that highlight the molecular and cellular basis of the structure-function relationship.
in the brain, such as neurogenomics (HMB360), neuroanatomy (HMB320), and the neurobiology of behaviour (HMB300). Further depth in these subjects is available at the 3rd year level in courses that focus on the neurobiology of the synapse (CSB332), behavioural genetics (PSY390), or human physiology (PSL301). In 4th year, students can further engage in specialized courses in memory and learning (PSY460 and PSY470), neurogenesis (CSB430), cellular neurophysiology (CSB432), and the pathobiology of neurodegenerative disease (LMP410). Other advanced courses complement these specialized topics by integrating concepts from other fields, such as health care ethics (HMB406), exercise and mental health (HMB473), nutritional neurosciences (NFS489), and abnormal psychology (PSY440).

4.2 COMPETENCIES

4.2.1 CRITICAL AND CREATIVE THINKING

Students engage in critical thinking early on in the program. For example, in HMB265, HMB300, HMB360 there are assignments and tests that focus on the application of course concepts and information through problem-based learning, whereas written assignments and oral presentations are based on the synthesis and critical analysis of information and techniques from both primary and review articles. In HMB220, students produce a written “debate” assignment where they are required to research and gather evidence for both sides of a topic, evaluate that evidence and then form conclusions. As with all life science programs, the integration of primary research findings into all of our courses, but especially in 3rd and 4th year, is a critical component of the student learning experience. Students are taught how to interpret and critically analyze research as well as develop the skills in synthesizing information from multiple sources. The program also uses creative ways to facilitate reflective thinking. For example, in HMB471, students engage in a semester-long self-test “lab” to assess the effects of stress control techniques on performance. Moreover, HMB440 integrates community engaged learning as a primary method for teaching students about neurobiology of dementia and its societal implications.

4.2.2 COMMUNICATION

Students learn effective written and oral strategies for communicating their analyses and critiques. For example, seminar courses often require students to be creative and persuasive in developing research proposals (HMB440) or learning to transform highly specialized and detailed research findings into an engaging and informative story that is understandable to an informed public (CSB430). Team-based learning and peer evaluations, either in class or online, are also integrated in several different courses (HMB300, HMB360). Seminar presentations or poster presentations are common among most advanced courses and this enables students to develop key skills in explaining, discussing, critically analyzing and synthesizing research findings in an oral presentation format. Students also have opportunities to cultivate an ability to interact and debate issues in a group setting with guest speakers that are experts in their fields, preparing them with communication skills that will be useful in a professional workplace.

4.2.3 INFORMATION LITERACY

In order to complete written and oral assignments, students are required to learn to use Internet based search engines (e.g. PubMed, Google Scholar, Ensembl, Allen Brain Atlas, etc.) to acquire relevant information from the primary literature, and genome and gene expression databases. Students are typically evaluated on their effective gathering and use of this information through enhanced citations, and the ability to use PowerPoint, Keynote, blogs and other presentation formats.

4.2.4 QUANTITATIVE REASONING

While many courses will integrate quantitative analysis and reasoning, such as genetic mapping (HMB265), GWAS analysis (HMB360), and statistically analyzing altered physical parameters due to exercise (HMB471), the program also requires that students take basic statistics courses (STA220H1/PSY201H1 and STA221H1/PSY202H1/HMB325H1) that will serve as a foundation for understanding concepts and analyzing research in other courses. Students are also required to complete one 3rd year laboratory course and one 4th year research project course, which provides consecutive opportunities to gain first hand experience acquiring and analyzing quantitative data.

4.2.5 SOCIAL AND ETHICAL RESPONSIBILITY
Several courses will introduce students to some of the bioethical, social and health policy issues and controversies surrounding specific topics in neuroscience, including prenatal diagnosis (HMB360), mental health (HMB440), and health care ethics (HMB406). Students in HMB220 partner with the Geneva Centre for Autism to promote social awareness. The program also requires that students take at least one course on bioethics (PHL281 or HMB306). The overall objective is to challenge students to think about the benefits of modern neuroscience, the limits of these benefits, and negative repercussions that neuroscience applications might have on society, including medicine, law and biotechnology.

4.3 AN INTEGRATIVE, INQUIRY-BASED ACTIVITY

Seminar courses in 4th year provide a major opportunity for students to integrate knowledge from across a spectrum of neuroscience and other life science courses. A hallmark of the Specialist program is the requirement to complete a 4th year research project course (HMB499). Students will typically identify suitable supervisors in hospital research institutes or campus-based laboratories and research groups. Research project course oversight includes an HBP faculty advisor and undergraduate research staff that facilitate the placements, guide workshops on research presentation skills or apply statistical analyses (in collaboration with Department of Statistical Sciences), as well as organize research presentation days (with research faculty to serving as assessors). Students gain invaluable first-hand experience integrating their knowledge of neuroscience and other related subjects, learn to apply their quantitative reasoning and analytical skills, practice effective communication and team-based learning, and learn about ethical standards in research.

PART II – Internal Information for Governance

5. Rationale and Background Information

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