

DATE: June 29, 2024

TO: Senate

FROM: Dr. David Hornsby, Vice-Provost and Associate Vice-President (Academic), and Chair, Senate Quality Assurance and Planning Committee

RE: 2024-2025 2025-26 Calendar Curriculum Proposals  
**Undergraduate and Graduate Major Modifications & Governance change**

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**Background**

Following Faculty Board approval, as part of academic quality assurance, major curriculum modifications and governance changes are considered by the Senate Quality Assurance and Planning Committee (SQAPC) before being recommended to Senate. Major curriculum modifications are also considered by the Senate Committee on Curriculum, Admissions and Studies Policy (SCCASP).

**Library Reports (as required)**

In electronic communication members of the Library staff, upon review of the proposals, confirmed no additional resources were required for the 2025-26 major modifications included below.

**Documentation**

Recommended calendar language, along with supplemental documentation as appropriate, are provided for consideration and approval.

**Omnibus Motion**

In order to expedite business with the multiple changes that are subject to Senate approval at this meeting, the following omnibus motion will be moved. Senators may wish to identify any of the following 4 major modifications and governance change that they feel warrant individual discussion that will then not be covered by the omnibus motion. Independent motions as set out below will nonetheless be written into the Senate minutes for those major modifications that Senators agree can be covered by the omnibus motion.

**THAT** Senate approve the major modifications and governance change as presented below.

**Major Modifications**

**1. MEng Technology Innovation Management**

SCCASP approval: May 7, 2024

SQAPC approval: May 9, 2024

**Senate Motion June 7, 2024**

**THAT** Senate approve the change in degree name from the MEng in Technology Innovation Management to the M.Tech. in Technology Innovation Management as presented with effect in Fall 2025.

**2. Bachelor of Health Sciences Honours with concentration**

SCCASP approval: May 28, 2024

SQAPC approval: May 23, 2024

**Senate Motion June 7, 2024**

**THAT** Senate approve the major modification to the Bachelor of Health Sciences (Hons) with concentration program as presented with effect from Fall 2025.

**3. Earth Sciences, concentration in Environmental Geosciences**

SCCASP approval: April 16, 2024

SQAPC approval: May 28, 2024 (e-vote)

**Senate Motion June 7, 2024**

**THAT** Senate approve the introduction of the Concentration in Environmental Geosciences as presented with effect from Fall 2025.

**4. Latin American and Caribbean Studies**

SCCASP approval: N/A

SQAPC approval: May 28, 2024 (e-vote)

**Senate Motion June 7, 2024**

**THAT** Senate approve that the governance for the programs in Latin American and Caribbean Studies be moved from the Department of History to the Institute of Interdisciplinary Studies as presented with effect from Fall 2024.

## MEMORANDUM

**To:** Vice-President's Academic and Research Committee (VPARC)

**From:** Tony Bailetti, Associate Professor, Sprott, SCE

**CC:** Patrice Smith, Dean, Faculty of Graduate and Postdoctoral Affairs  
Daniel Siddiqi, Associate Dean (Programs), FGPA  
Howard Nemiroff, Dean, Sprott School of Business  
Robin Ritchie, Associate Dean (Professional Graduate Programs), Sprott  
Larry Kostiuk, Dean, Faculty of Engineering and Design  
Richard Dansereau, Associate Dean (Graduate Studies and Postdoctoral Affairs), FED

**Date:** January 15, 2024

**Subject:** Major Modification to M.Eng. Technology Innovation Management Track A1:  
*Rename M.Eng, Technology Innovation Management to M. Tech, Technology Innovation Management*

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### **Modification Description**

Proposed Change:

The pathway in the TIM program that is currently called a Master of Engineering in Technology Innovation Management (MEng in TIM) will be renamed a Master of Technology in Technology Innovation Management (MTech in TIM).

Rationale:

In a memo dated September 6, 2023, VPARC was informed of the change in governance structure pertaining to all TIM programming. The purpose of the proposed degree name change is to recognize that TIM is now solely within the governance structure of the Sprott School of Business. As a result, offering a degree within the Sprott School named MEng is confusing. Consequently, the MEng name change became a required collateral change.

The modification is a name change only. There is no impact to the program structure, mode of delivery or graduation requirements. The present structure of the MEng includes TIMG courses as core, with additional requirements and optional electives available in Business (including TIMG courses), Engineering, or Science. As such, there is no effect on the offerings.

### **Impact on Other Programs**

There is no impact on other programs presently offered.

### **Impact on Learning Outcomes and Curriculum Map**

No impact

### **Societal Need**

No impact

### **Students**

Students currently registered in the MEng in TIM pathway will be able to complete the MEng in TIM or switch to the MTech in TIM.

### **Resources**

No impact

### **Governance**

Please see the memo to VPARC dated September 6, 2023.

### **Appendix A**

What follows is a brief historical timeline of the development of how the MEng in TIM pathway came to be, justifying the steps necessary to put forth a name change modification.

- The Faculty of Engineering and Design initiated the Telecommunications Technology Management (TTM) program in 1994, offering a MASc degree (thesis-based). Three faculty members from the School of Business were jointly appointed to support program delivery. Program governance rested within the Faculty of Engineering.
- In 2002, Carleton University transitioned the TTM program into the Technology Innovation Management (TIM) program, authorized to confer both MASc (thesis-based) and MEng (project-based) degrees.
- In 2014, the governance of the TIM program underwent a significant change. Curriculum governance shifted from the Faculty of Engineering to a collaborative arrangement between the Sprott School of Business, the Faculty of Engineering, and the Faculty of Graduate Studies.
- In 2016, as a consequence of the addition of the Master of Entrepreneurship, the MEng TIM program became a named pathway in the TIM program.
- In April 2022, the Dean of Sprott and the Dean of Engineering began the transition of program governance from the Faculty of Engineering to the Sprott School of Business.

As of January 8, 2024, there are a total of 230 students enrolled in the TIM program. Among them, 76 students are registered in the MEng in Technology Innovation Management (MEng in TIM) pathway, accounting for 33% of the TIM program's enrollment.

Date Submitted: 03/20/24 4:32 pm

Viewing: **MENG-TIM : M.Tech. ~~M.Eng.~~**  
**Technology Innovation Management**

Last approved: 03/20/24 4:27 pm

Last edit: 05/09/24 9:51 am

Last modified by: nataliephelan

[Changes proposed by: sandrabauer](#)

## In Workflow

1. TIMG ChairDir GR
2. BUS Dean
3. BUS GFCC
4. BUS FBoard
5. PRE SCCASP
6. SCCASP
7. SQAPC
8. Senate
9. CalEditor

## Approval Path

1. 04/22/24 3:02 pm  
Robin Ritchie  
(robinritchie): Approved  
for TIMG ChairDir GR
2. 04/22/24 3:03 pm  
Robin Ritchie  
(robinritchie): Approved  
for BUS Dean
3. 04/22/24 3:03 pm  
Robin Ritchie  
(robinritchie): Approved  
for BUS GFCC
4. 04/29/24 4:06 pm  
Robin Ritchie  
(robinritchie): Approved  
for BUS FBoard
5. 05/08/24 11:59 am  
Natalie Phelan  
(nataliephelan):  
Approved for PRE  
SCCASP
6. 05/13/24 11:06 am  
Erika Strathearn  
(erikastrathearn):  
Approved for SCCASP
7. 05/14/24 8:40 am  
Christina Noja  
(christinanoja): Approved  
for SQAPC

## History

1. May 8, 2017 by Sandra Bauer (sandrabauer)

- 2. Apr 11, 2018 by Mike Labreque (mikelabreque)
- 3. Apr 1, 2020 by Sandra Bauer (sandrabauer)
- 4. Apr 30, 2020 by Sarah Cleary (sarahcleary)
- 5. Mar 20, 2024 by Sandra Bauer (sandrabauer)

Calendar Pages Using this Program [Technology Innovation Management](#)

Effective Date	2025-26
Workflow	majormod
Program Code	MENG-TIM
Level	Graduate
Faculty	Sprott School of Business
Academic Unit	Technology Innovation Management Program
Degree	<del>Master of Engineering</del>
Title	<del>M.Tech. M.Eng.</del> Technology Innovation Management

## Program Requirements

### ~~M.Eng.~~ Master of Technology Technology Innovation Management (5.5 credits)

Students in the Master of Technology ~~Master of Engineering~~ program are required to complete a total of of 5.5 credits, of credits of which at least 5.0 must be at the 5000-level or above, as follows:

Requirements - Project pathway (5.5 credits)

<b>1. 1.5 credits in</b> compulsory courses including:	1.5
<a href="#">TIMG 5001</a> [0.5] Principles of Technology Innovation Management	
<a href="#">TIMG 5002</a> [0.5] Technology Entrepreneurship	
<a href="#">TIMG 5003</a> [0.5] Issues in Technology Innovation Management	
<b>2. 2.0 credits in</b> approved restricted elective courses	2.0
<b>3. 1.0 credit in</b> approved non-restricted electives	1.0
<b>4. 1.0 credit in</b> a graduate project	1.0
Total Credits	5.5

#### Restricted Elective Courses

Students in the M.Tech. M.Eng. program must complete 1.0 credit in the field of technology innovation management and 1.0 credit in engineering, business or science. Courses in the field of technology innovation management begin with the prefix TIMG.

Non-Restricted Elective Courses

Students in the M.Tech. ~~M.Eng.~~ program are required to complete 1.0 credit from courses offered in engineering, business, or science.

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New Resources	No New Resources
Summary	<p>Change name of program from M.Eng. TIM to M.Tech.-TIM</p> <p>The pathway in the TIM program that is currently called a Master of Engineering in Technology Innovation Management (MEng in TIM) will be renamed a Master of Technology in Technology Innovation Management (MTech in TIM).</p>
Rationale for change	<p>Per 2024.01.15 Sprott/SCE executive summary to VPARC In a memo dated September 6, 2023, VPARC was informed of the change in governance structure pertaining to all TIM programming. The purpose of the proposed degree name change is to recognize that TIM is now solely within the governance structure of the Sprott School of Business. As a result, offering a degree within the Sprott School named MEng is confusing. Consequently, the MEng name change became a required collateral change. The modification is a name change only. There is no impact to the program structure, mode of delivery or graduation requirements. The present structure of the MEng includes TIMG courses as core, with additional requirements and optional electives available in Business (including TIMG courses), Engineering, or Science. As such, there is no effect on the offerings.</p>
Transition/Implementation	Students currently registered in the MEng in TIM pathway will be able to complete the MEng in TIM or switch to the MTech in TIM.

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Program reviewer comments      **nataliephelan (05/09/24 9:51 am):** At SQAPC's request, added to transition plan.

## Sandra Bauer

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**From:** Larry Kostiuk  
**Sent:** Saturday, January 13, 2024 6:09 PM  
**To:** Sandra Bauer; Richard Dansereau  
**Cc:** Dan Siddiqi; Sandra Bauer  
**Subject:** Re: MEng TIM Name Change - Response required by January 18, 2024  
**Attachments:** ESforMTech\_20240111[66].docx

Hi,

I did some small (non-necessary) edits, which you can ignore.

Larry

---

**From:** Sandra Bauer <SandraBauer@Cunet.Carleton.Ca>  
**Date:** Thursday, January 11, 2024 at 1:17 PM  
**To:** Larry Kostiuk <LarryKostiuk@cunet.carleton.ca>, Richard Dansereau <RichardDansereau@cunet.carleton.ca>  
**Cc:** Dan Siddiqi <DanielSiddiqi@cunet.carleton.ca>, Sandra Bauer <SandraBauer@Cunet.Carleton.Ca>  
**Subject:** MEng TIM Name Change - Response required by January 18, 2024

Greetings,

The process for executive summaries requires that before proposals can proceed to VPARC, explicit statements of acknowledgment and assent be collected from each of the individuals listed in the from: and cc: fields.

Would you kindly respond to this message by reply email by the date indicated in the subject line of this email, indicating your assent that the proposal goes forward to VPARC.

Thanks,

---

**Sandra Bauer** (she/her)  
Program Officer/Graduate Calendar Editor  
Faculty of Graduate and Postdoctoral Affairs  
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**Sandra Bauer**

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**From:** Howard Nemiroff  
**Sent:** Thursday, January 11, 2024 1:29 PM  
**To:** Sandra Bauer; Robin Ritchie  
**Cc:** Dan Siddiqi; Sandra Bauer  
**Subject:** Re: MEng Tim Name Change - Response required by January 18, 2024

Thanks Sandra – I support this going forward to VPARC.

\*\*\*\*\*

Howard B. Nemiroff, Ph.D.  
Dean, Sprott School of Business

Carleton University  
1125 Colonel By Drive  
Ottawa, ON K1S 5B6

v: 613.520.2600, x2038  
e: [howard.nemiroff@carleton.ca](mailto:howard.nemiroff@carleton.ca)



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**From:** Sandra Bauer <[SandraBauer@Cunet.Carleton.Ca](mailto:SandraBauer@Cunet.Carleton.Ca)>  
**Date:** Thursday, January 11, 2024 at 1:15 PM  
**To:** Howard Nemiroff <[HowardNemiroff@Cunet.Carleton.Ca](mailto:HowardNemiroff@Cunet.Carleton.Ca)>, Robin Ritchie <[RobinRitchie@Cunet.Carleton.Ca](mailto:RobinRitchie@Cunet.Carleton.Ca)>  
**Cc:** Dan Siddiqi <[DanielSiddiqi@cunet.carleton.ca](mailto:DanielSiddiqi@cunet.carleton.ca)>, Sandra Bauer <[SandraBauer@Cunet.Carleton.Ca](mailto:SandraBauer@Cunet.Carleton.Ca)>  
**Subject:** MEng Tim Name Change - Response required by January 18, 2024

Greetings,

The process for executive summaries requires that before proposals can proceed to VPARC, explicit statements of acknowledgment and assent be collected from each of the individuals listed in the from: and cc: fields.

Would you kindly respond to this message by reply email by the date indicated in the subject line of this email, indicating your assent that the proposal goes forward to VPARC.

Thanks,

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**Sandra Bauer** (she/her)  
Program Officer/Graduate Calendar Editor  
Faculty of Graduate and Postdoctoral Affairs

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Thank you

*Christina Noja*

Director  
Office of Academic Programs  
and Strategic Initiatives

**From:** Dan Siddiqi <[DanielSiddiqi@cunet.carleton.ca](mailto:DanielSiddiqi@cunet.carleton.ca)>  
**Sent:** March 7, 2024 8:54 AM  
**To:** Christina Noja <[ChristinaNoja@cunet.carleton.ca](mailto:ChristinaNoja@cunet.carleton.ca)>  
**Cc:** Howard Nemiroff <[HowardNemiroff@Cunet.Carleton.Ca](mailto:HowardNemiroff@Cunet.Carleton.Ca)>  
**Subject:** MTECH in Technology Innovation Management

Hello Christina,

Howard and I met briefly to discuss the concerns raised at VPARC that the name of the degree "Masters of Technology in Technology Innovation Management" is a bit of a mouthful given the word Technology appearing twice in close proximity. We understand these concerns but relay to VPARC that this name was carefully considered and negotiated across a large number of stakeholders and that this was the compromise result. Furthermore, it is pretty normal for degrees to restate their name. For example, Carleton offers a Masters of Engineering in Engineering Practice, a Bachelor of Arts in Art History, a Bachelor of Science in Earth Sciences, etc. This does not strike us as an especially exceptional naming practice, so the compromise doesn't seem to have very high costs.

Thanks for reaching out to us,

Dan

Daniel Siddiqi

*Associate Dean (Programs), Faculty of Graduate and Postdoctoral Affairs  
Professor of Linguistics, School of Linguistics and Language Studies*

*Carleton University*

*249 Paterson Hall (SLaLS); 512E Tory Hall (FGPA)*

*613-520-2600 ext 1249 (Paterson); ext 1809 (Tory)*

## MEMORANDUM

**To:** Senate Quality Assurance and Planning Committee (SQAPC) for A2s

**From:** Martin Holcik, Department of Health Sciences

**CC:** Maria De Rosa, Julia Wallace

**Date:** May 3, 2024

**Subject:** Major Modification to Bachelor of Health Sciences Track [A2]

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### **Modification Description** (1-1.5 pages)

This request is to streamline entry into BHSc and has been recommended by the recent cyclical review of the BHSc program and in discussions with the Admissions Office.

At the end of May 2023, the BHSc program underwent its first cyclical review. One of the review panel's recommendations (3b) was to "Delay selection of a more limited number of concentrations until after the second year, with deliberate exposure to those areas in the common curriculum of Yrs 1-2."

Currently, incoming BHSc students must select one of five concentrations at the time of application. This choice is based on their limited knowledge of the program, gleaned from the viewbook and other recruitment materials, visits to OUF and/or Carleton Open Houses. As a result, many students switch concentrations during or after the first year once they learn more about the breadth of health sciences fields. In addition, some students get confused with the OUAC application process and apply to the wrong program entirely.

To alleviate these issues, we propose to create a **single-point entry** into BHSc. Once in the program, students will make evidence-based decisions about which concentration to enroll in. Since the courses BHSc students take in their first year are the same for all BHSc students, irrespective of their concentrations, our proposed change will not impact program progression nor require additional curricular changes. This change also has no impact on the learning outcomes of the program. In addition, this change will not affect existing students.

### **Impact on Other Programs** (½ page)

This modification will have no impact on other programs.

### **Societal Need** (½ page) (***Only applicable if introducing an A1 modification or a new concentration***)

N/A

### **Student Demand** (½ page)

As part of the BHSc cyclical review, the external review panel met with students currently enrolled in the program. The committee recommendation was based partially on the student feedback, reflecting their need and preferences.

**Resources** (1-2 pages)

No additional resources are required. Student advising is already in place to help students choose a concentration before registering for the second year. We are working with RO to create a system to ensure students declare concentration before being allowed to register for the second year (similar to some other programs at Carleton).

Date Submitted: 02/12/24 12:57 pm

## Viewing: **HBHS-35X : Bachelor of Health Sciences Honours with Concentration**

Last approved: 04/20/23 4:28 pm

Last edit: 02/15/24 10:56 am

Last modified by: nataliephelan

[Changes proposed by: sandracloutier](#)

### In Workflow

1. **HLTH ChairDir UG**
2. **SCI Dean**
3. **SCI FCC**
4. **SCI FBoard**
5. **PRE SCCASP**
6. SCCASP
7. SQAPC
8. Senate
9. PRE CalEditor
10. CalEditor

### Approval Path

1. 02/12/24 1:19 pm  
Martin Holcik  
(martinholcik): Approved for HLTH ChairDir UG
2. 02/15/24 11:53 am  
Julia Wallace  
(juliawallace): Approved for SCI Dean
3. 03/22/24 12:24 pm  
Julia Wallace  
(juliawallace): Approved for SCI FCC
4. 03/22/24 12:28 pm  
Julia Wallace  
(juliawallace): Approved for SCI FBoard

### History

1. Mar 4, 2014 by sandra
2. May 20, 2014 by sandra
3. May 30, 2014 by sandra
4. Jan 19, 2017 by Sandra Bauer (sandrabauer)
5. Apr 24, 2017 by Sandra Bauer (sandrabauer)
6. Jun 7, 2017 by Sandra Bauer (sandrabauer)
7. Jun 7, 2017 by Sandra Bauer (sandrabauer)
8. Jan 30, 2018 by Sandra Cloutier (sandracloutier)
9. Mar 21, 2019 by Sandra Cloutier (sandracloutier)

Calendar Pages Using this Program [Health Sciences](#)

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Effective Date	2025-26
Workflow	<a href="#">majormod</a> <a href="#">minormod</a>
Program Code	HBHS-35X
Level	Undergraduate
Faculty	Faculty of Science
Academic Unit	Department of Health Sciences
Degree	Bachelor of Health Sciences Honours
Title	Bachelor of Health Sciences Honours with Concentration

## Program Requirements

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### Health Sciences with Concentration B.H.Sc. [Honours \(20.0 credits\)](#)

[Before the second year of study, students in this program must register in one of the concentrations listed below.](#)

#### A. Credits Included in the Major CGPA (10.0 credits)

- |                                    |  |
|------------------------------------|--|
| <b>1. 4.5 credits in:</b>          | 4.5  |
| <a href="#">HLTH 1000</a> [0.5]    | Fundamentals of Health                             |
| <a href="#">HLTH 1002</a> [0.5]    | Health Science Communication                       |
| <a href="#">HLTH 2001</a> [0.5]    | Health Research Methods and Skills                 |
| <a href="#">HLTH 2002</a> [0.5]    | Molecular and Cellular Pathology                   |
| <a href="#">HLTH 2003</a> [0.5]    | Social Determinants of Health                      |
| <a href="#">HLTH 3101</a> [0.5]    | Global Health                                      |
| <a href="#">HLTH 3201</a> [0.5]    | Epidemiology                                       |
| <a href="#">HLTH 3302</a> [0.5]    | Immunity and Immune-Related Disorders              |
| <a href="#">HLTH 3404</a> [0.5]    | Psychosocial and Biological Interactions in Health |
| <b>2. 1.5 credits in:</b>          | 1.5  |
| a) Project/Field Placement pathway |  |
| 0.5 credit from:                   |  |
| <a href="#">HLTH 3901</a> [0.5]    | Emerging Issues in Health Sciences I               |
| <a href="#">HLTH 3902</a> [0.5]    | Emerging Issues in Health Sciences II              |
| <a href="#">HLTH 3903</a> [0.5]    | Emerging Issues in Health Sciences III             |
| <a href="#">HLTH 3904</a> [0.5]    | Emerging Issues in Health Sciences IV              |
| <a href="#">HLTH 3905</a> [0.5]    | Emerging Issues in Health Sciences V               |

and

1.0 credit from:

<a href="#">HLTH 4907</a> [1.0]	Capstone Course – Group Research Project
<a href="#">HLTH 4909</a> [1.0]	Capstone Course – Field Placement and Research Project
<a href="#">HLTH 4910</a> [1.0]	Honours Individual Research Thesis

OR

b) Essay pathway

0.5 credit in HLTH elective at the 3000 level or above

and

1.0 credit in:

<a href="#">HLTH 4906</a> [1.0]	Capstone course – Research Essay
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<b>3. 0.5 credit in</b> HLTH at the 3000 level or above		0.5
<b>4. 3.5 credits in</b> concentration electives at the 3000 level or above		3.5
B. Credits Not Included in the Major CGPA (10.0 credits)		
<b>5. 2.5 credits in:</b>		2.5
<a href="#">BIOL 1103</a> [0.5]	Foundations of Biology I	
<a href="#">BIOL 1104</a> [0.5]	Foundations of Biology II	
<a href="#">CHEM 1001</a> [0.5]	General Chemistry I	
<a href="#">CHEM 1002</a> [0.5]	General Chemistry II	
<a href="#">MATH 1007</a> [0.5]	Elementary Calculus I	
<b>6. 1.0 credit from:</b>		1.0
<a href="#">ECON 1001</a> [0.5]	Introduction to Microeconomics	
& <a href="#">ECON 1002</a> [0.5]	Introduction to Macroeconomics	
or		
<a href="#">PSYC 1001</a> [0.5]	Introduction to Psychology I	
& <a href="#">PSYC 1002</a> [0.5]	Introduction to Psychology II	
<b>7. 1.0 credit in:</b>		1.0
<a href="#">STAT 2507</a> [0.5]	Introduction to Statistical Modeling I	
<a href="#">STAT 2509</a> [0.5]	Introduction to Statistical Modeling II	
<b>8. 1.0 credit in:</b>		1.0
<a href="#">BIOL 2104</a> [0.5]	Introductory Genetics	
<a href="#">BIOL 2200</a> [0.5]	Cellular Biochemistry	
<b>9. 1.0 credit in</b> approved 2000-level concentration electives		1.0
<b>10. 0.5 credit from:</b>		0.5
<a href="#">PHIL 1550</a> [0.5]	Introduction to Ethics and Social Issues	
<a href="#">PHIL 2408</a> [0.5]	Bioethics	
<b>11. 3.0 credits in</b> free electives.		3.0

NOTE: The maximum allowed combined number of minors and concentrations for any student is two.

Total Credits		20.0
<del>Honours (20.0 credits)</del>		

New Resources No New Resources

Summary Viewbook mod 24-25, effective date 25-26.

Rationale for change This request is to streamline entry into BHSc and has been recommended by the recent cyclical review of the BHSc program and in discussions with the Admissions folks. Currently, incoming students have to select one of five concentrations in BHSc at the time of application. This choice is based on their limited knowledge of the program. As a result, many



students end up switching concentrations during or after the first year. In addition, some students get confused with the OUAC application process and apply to the wrong program entirely. To alleviate these issues, we propose to create a single-point entry into BHSc. Once in the program, students can make evidence-based decisions about which program to enroll in. Since the courses BHSc students take in their first year are the same for all students, irrespective of their concentrations, our proposed change will not impact program progression, nor will it require additional curricular changes.

#### Transition/Implementation

This change will have no impact on the existing students. Since the courses BHSc students take in their first year are the same for all students, irrespective of their concentrations, our proposed change will not impact program progression, nor will it require additional curricular changes.

Student advising is already in place to help students choose a concentration before registering for the second year.

We are working with RO on creating a system that will ensure students declare concentration before being allowed to register for the second year (similar to some other programs at Carleton)

---

#### Program reviewer comments

**nataliephelan (02/14/24 1:29 pm):** Per R. Green, changed to minor mod workflow.

**nataliephelan (02/15/24 10:56 am):** Per R. Green, reverting back to major mod workflow.

Key: 1034

## MEMORANDUM

**To:** Senate Quality Assurance and Planning Committee (SQAPC)

**From:** Earth Sciences

**CC:** Maria DeRosa, Dean of Sciences

**Date: (Revised)** December 19, 2023

**Subject:** Major Modification to EARTH BSc Honors – Earth Sciences with Concentration in Environmental Geosciences. Track A2

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### **Modification Description**

The proposed modification is the introduction of a new Earth Sciences Honors program with a concentration in Environmental Geosciences.

### **Rationale for creation of a new program**

All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

The new curriculum has been approved by the Science Committee on Academic Planning (SCAP) and Science Faculty Board (SFB) and is summarized in Appendix 1. The core of the program is very similar to the core of the Honors program in Earth Sciences; the differences lie in the focus of the palette of optional non-core courses on topics that would allow graduates to qualify for professional status with the Environmental stream of the Professional Geoscientists of Ontario. An undergraduate degree with a concentration in Environmental Geosciences will play a pivotal role in enhancing the job prospects of graduating students by aligning them with a burgeoning field that addresses critical environmental challenges. The demand for professionals with expertise in Environmental Geosciences continues to rise, creating diverse and promising well-paying career opportunities for graduates without a requirement to obtain an advanced degree in various industries.

### **Impact on Other Programs** (½ page)

The proposed new program is expected to contribute significantly to the growth of student enrollment in the Earth Sciences department. The impact on other Earth Sciences programs will be positive in that there will be somewhat larger class sizes in core Earth Science courses. We see this as a net positive because our core classes are not currently oversubscribed so the addition of people to the sum of our

programs will boost overall enrolment in the department and add to the progress and momentum of all parts of the department.

The impact on other academic units will be minimal. Because the parts of the curriculum choices outside the Earth Sciences department consist of choices from a palette of different courses in different units, and the total number of students involved is expected to be moderate (e.g., 5 to 10 per year), the class sizes in the cognate departments will not be affected in any material way. The Institute for Environmental and Interdisciplinary Science and the departments of Geography and Chemistry have all approved of the proposed curriculum and overall program composition and designation both at SCAP and at SFB.

### **Societal Need**

Canadian society is increasingly conscious of the need for well-trained professionals to work in fields related to Environmental Geosciences. The areas of application include; baseline studies for any number of infrastructure projects at all scales, monitoring of environmental-social-governance (ESG) components of projects during their operation, and remediation of environmental problems like orphaned legacy resource or industrial infrastructure or planned decommissioning of mines and other industrial sites. The graduates of this program will find ample opportunity to put their knowledge to work in the service of society.

### **Student Demand**

Anticipated student demand for the new Department of Earth Sciences Honors Environmental Geoscience program is conservatively estimated to be initially between 5 and 10 new registrations per year. The goal is to grow this number in the coming years, aiming for the new concentration to contribute to eventually substantially increasing the overall number of Earth Sciences majors. Notably, during recent recruitment events, there has been a noticeable shift in interest among potential Earth Sciences majors towards environmentally oriented career options. This has been problematic, as having no specific Environmental Geoscience program we are at a disadvantage compared to other Ontario universities, notably our primary competitor, the University of Ottawa, where their Earth Sciences department has recently rebranded to the Department of Earth and Environmental Science, and now offers multiple environmental programs.

Additionally, recent graduates from our own department have shared anecdotal reports of an increasing trend towards them obtaining positions in environmental firms, such as WSP, Stantec, Minnow, etc. There is a significant demand for employees with a geological background in these firms, who often command higher salaries than their counterparts with only environmental sciences credentials. This is attributed, in large part, to our graduates possessing the necessary courses for PGO accreditation. These alumni express the view that having a diploma indicating specific Environmental Geoscience credentials would have been beneficial for their career paths.

Government of Canada Job Bank data supports the notion of excellent job opportunities for Environmental Geoscientists in Ontario and much of Canada, with an anticipated need for 10,100 new

positions in the next three years<sup>1</sup>. The recent federal government announcement mandating that all new vehicles be electric by 2035 is expected to further increase this demand, given the current inadequate global supply of critical minerals required for electric vehicle manufacturing to meet this deadline. Beyond the requirement for additional environmental geoscientists for critical mineral exploration other new environmental geoscientists will be required to carry out mandatory environmental assessments.

Furthermore, new entrants to our programs seeking a career in Environmental Geoscience currently encounter a somewhat confusing array of program choices. The absence of a clearly outlined pathway for constructing a customized Environmental Geosciences concentration within the core Earth Sciences program poses a challenge. The Earth Sciences department believes that this ambiguity dissuades many potential applicants, a perspective supported anecdotally through conversations with current undergraduate students in our programs. Establishing a PGO-compliant program with the proposed name "Honors BSc in Earth Sciences with a concentration in Environmental Geosciences" aims to address this obstacle, making it unequivocally clear to prospective students that a viable career path exists in this domain.

1. Government of Canada Job Bank job opportunities for Environmental Geologists in Canada over the new 3 years (accessed December 20, 2023) - <https://www.jobbank.gc.ca/marketreport/outlook-occupation/2547/ca;jsessionid=4666C407BCC788DA0AC52ECD14BD998E.jobsearch76>

### **Resources**

The anticipated demand for resources is very minimal. All of the courses within the new concentration are already taught within the Faculty. Addition of a few extra students to existing classes will not affect teaching resources or the need for administrative support. There are some courses within the program curriculum that are offered by cognate departments including Geography and Chemistry. All such course requirements have already been approved by the respective departments through discussions at SCAP and SFB. There will be no additional space requirements nor any requirement for additional equipment. In essence, the goal in creating this new concentration is to increase the number of students taking courses that already exist, by increasing overall program enrolment. This is understood to be one of the principal goals of the Faculty.

### **Core Courses Defining the Concentration**

As required by the Carleton Glossary there is a requirement for "A program Element recorded on the transcript and diploma constituted by at least 3.5 credits of required courses at the undergraduate level". The full requirements for the concentration are provided in Appendix 1 below.

Listed below are 4.5 credits within the proposed concentration that are the core courses within the concentration. They are listed by the section that they are found in the program requirements for Honors BSc in Earth Sciences with concentration in Environmental Sciences.

**1. 1.0 credit in:**

ERTH 1006 [0.5] Exploring Planet Earth

ERTH 1009 [0.5] The Earth System Through Time

**5. 2.5 credits in:**

ERTH 3003 [0.5] Geochemistry and Geochronology

ERTH 3205 [0.5] Physical Hydrogeology

ERTH 3405 [0.5] Geophysical Methods

ERTH 3806 [0.5] Structural Geology

GEOG 3108 [0.5] Soil Properties

**8. 1.0 credit from:**

ERTH 4908 [1.0] Honors Thesis

ERTH 4909 [0.5] Research in Earth Sciences (and 0.5 credit in EARTH at the 4000 level)

**Appendix 1. Program requirements for Hons BSc in Earth Sciences with concentration in Environmental Sciences.**

A. Credits Included in the Major CGPA (11.5 credits)

**1. 1.0 credit in:**

ERTH 1006 [0.5] Exploring Planet Earth

ERTH 1009 [0.5] The Earth System Through Time

**2. 3.5 credits in:**

ERTH 2102 [0.5] Mineralogy to Petrology

ERTH 2104 [0.5] Igneous Systems, Geochemistry and Processes

ERTH 2105 [0.5] Geodynamics

ERTH 2314 [0.5] Sedimentation and Stratigraphy

ERTH 2406 [0.5] Geology and Map Interpretation

ERTH 2802 [0.5] Field Geology I

GEOG 2013 [0.5] Weather and Water

**3. 1.0 credit from:**

ERTH 2312 [0.5] Paleontology

ERTH 3204 [0.5] Mineral Deposits

ERTH 3207 [0.5] Metamorphic Petrology and Processes

**4. 0.5 credits from:**

ERTH 3203 [0.5] Sedimentology

ERTH 3206 [0.5] Sedimentary Depositional Systems

**5. 2.5 credits in:**

ERTH 3003 [0.5] Geochemistry and Geochronology

ERTH 3205 [0.5] Physical Hydrogeology

ERTH 3405 [0.5] Geophysical Methods

ERTH 3806 [0.5] Structural Geology

GEOG 3108 [0.5] Soil Properties

**6. 1.0 credit from:**

ERTH 4006 [0.5] Geobiology

ERTH 4008 [0.0] Topics in Paleobiology and Evolution

ERTH 4206 [0.5] Contaminant and Remediation Hydrogeology

ERTH 4815 [0.5] Natural Hazards in Canada

**7. 1.0 credit in EARTH at the 4000-level**

**8. 1.0 credit from:**

ERTH 4908 [1.0] Honors Thesis

ERTH 4909 [0.5] Research in Earth Sciences (and 0.5 credit in EARTH at the 4000 level)

B. Credits Not Included in the Major CGPA (9.0 credits)

**9. 1.0 credit in:**

MATH 1007 [0.5] Elementary Calculus I

MATH 1107 [0.5] Linear Algebra I

**10. 1.0 credit in:**

CHEM 1001 [0.5] General Chemistry I

CHEM 1002 [0.5] General Chemistry II

**11. 1.0 credit in:**

PHYS 1007 [0.5] Elementary University Physics I

PHYS 1008 [0.5] Elementary University Physics II

**12. 2.0 credits in:**

BIOL 1103 [0.5] Foundations of Biology I

BIOL 1104 [0.5] Foundations of Biology II

COMP 1005 [0.5] Introduction to Computer Science I

STAT 2507 [0.5] Introduction to Statistical Modeling I

**13. 1.0 credit in Science Continuation Courses (not EARTH)**

BIOL 2600 [0.5] Ecology

BIOL 3601 [0.5] Ecosystems and Environmental Change

GEOG 3103 [0.5] Watershed Hydrology

GEOG 3104 [0.5] Principles of Biogeography

GEOG 3105 [0.5] Climate and Atmospheric Change

GEOG/ENSC 3106 [0.5] Aquatic Science and Management

CHEM 2302 [0.5] Analytical Chemistry I

CHEM 2303 [0.5] Analytical Chemistry II

CHEM 2800 [0.5] Foundations for Environmental Chemistry

CHEM 3305 [0.5] Advanced Analytical Chemistry Laboratory

CHEM 3800 [0.5] The Chemistry of Environmental Pollutants

**14. 1.5 credits in:**

ERTH 2004 [0.5] Maps, Satellites and the Geospatial Revolution

PHIL 2380 [0.5] Introduction to Environmental Ethics

ERTH 2402 [0.5] Climate Change: An Earth Sciences Perspective

**15. 1.0 credit in** approved courses outside the faculty of Science and Engineering and Design

**16. 0.5 credit in** free electives

**Total Credits 20.5**



## Appendix 2. Curriculum map and learning outcomes

## Appendix 2. Learning Outcomes Curriculum Map – B.Sc. Honours with Concentration in Environmental Geosciences (20.5 credits)

Indicate at what level (if any) the learning outcome is addressed by each course or program component using the following coding scheme:

**I** = Outcome introduced; **R** = Outcome reinforced; **M** = Outcome mastered; - not applicable/covered; **X** = Outcome assessed

Program Components		1. Identify common minerals, rocks and fossils.	2. Construct and interpret datasets and maps (e.g., geological, hydrological, geochemical, GIS, paleontological, geophysical).	3. Develop a comprehensive knowledge of surficial and internal Earth processes and their principles through time.	4. Explain the origin, consumption and impacts of humans on natural resources (e.g., energy, mineral, water, atmosphere).	5. Conduct geological mapping or geophysical surveys, evaluate and interpret data, and construct internally consistent models.	6. Critically evaluate geoscience data and their uncertainty to produce a scientific report.	7. Critically evaluate geoscience data and present orally.	8. Produce independent research.	9. Demonstrate initiative, problem solving skills, teamwork and appreciation of knowledge limitations.	10. Understand and follow best professional practices (e.g. health and safety, ethics, social, legal, PGO).
Course level	Course number										
<b>1000-Level</b>	ERTH 1006	I	I	I	I	-	-	-	-	I	I
	ERTH 1009	I	I	I	I	-	-	-	-	I	I
<b>2000-Level</b>	ERTH 2102	I	I	I	I	-	I	-	I	R	R
	ERTH 2104	R	I	R	-	-	I	-	-	R	R
	ERTH 2105	-	I	R	-	I	I	-	-	I	-
	ERTH 2312	I	R	R	-	-	-	I	-	R	R
	ERTH 2314	R	I	R	R	I	I	I	-	I	R
	ERTH 2406	IR	IR	I	-	IR	I	-	-	I	I
	ERTH 2802	IR	IR	I	I	IR	IR	I	I	IR	IR
	GEOG 2013	-	I	I	I	-	-	-	-	I	-
<b>3000-Level</b>	ERTH 3003	-	R	R	-	-	R	-	-	R	-
	ERTH 3203	R	R	R	R	R	R	R		R	R

	ERTH 3204	R	R	R	M	-	R	-	-	-	-
	ERTH 3205	-	R	R	R	-	-	-	-	-	-
	ERTH 3206	R	R	R	R	R	R	R	-	R	R
	ERTH 3207	R	R	R	R	-	R	-	R	R	R
	GEOG 3108	R	R	R	R	-	R	-	-	R	-
	ERTH 3405	-	R	RM	R	M	M	-	-	M	-
	ERTH 3806	R	R	IR	R	R	R	-	-	R	R
4000-Level	ERTH 4006	M	M	R	I	M	M	M	R	R	R
	ERTH 4206	-	R	M	M	-	R	R	-	R	-
	ERTH 4815	-	RM	RM	RM	RM	RM	RM	RM	RM	-
	ERTH 4908	M	M	M	M	-	M	M	M	M	M
	ERTH 4909	M	M	M	M	-	M	-	M	M	M

## STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new **Earth Sciences Honors program with a concentration in Environmental Geosciences**. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

Because the parts of the curriculum choices outside the Earth Sciences department consist of choices from a palette of different courses in different units, and the total number of students involved is expected to be moderate (we estimate 5-10 students per year), the class sizes in the cognate departments will not be affected in any material way.

I support this change unconditionally.

I do not support this change.

I support this change, with the following reservations:

BIOL 1103 and 1104 are both prerequisites for BIOL2600 but only BIOL1104 is listed in the attached course list. If BIOL 1103 is not part of the core program, the course list here would have to be adjusted.

Signature:

Name: Bruce McKay

Title: Chair and Professor

Academic Unit: Biology

Date: Dec 20, 2023

Notes:

## STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new **Earth Sciences Honors program with a concentration in Environmental Geosciences**. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

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I support this change unconditionally.

I do not support this change.

I support this change, with the following reservations:

Suggestions, perhaps more than reservations, but:

- GEOG 3104 is listed in requirement 13, but to take it they would also have to use its prerequisite as the only other Science Continuation course. Not impossible, but our BSc coordinator raised this as a slightly awkward option.
- Murray also offered that GEOG 3003 might be a better option there, and these students would already have its prereq due to other program requirements.

Signature:



Name: Scott Mitchell

Title: Chair

Academic unit: Geography & Environmental Studies

Date: 18 Dec 2023

Notes:

STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new **Earth Sciences Honors program with a concentration in Environmental Geosciences**. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

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I support this change unconditionally.

I do not support this change.

I support this change, with the following reservations:

Signature:



Name: **Thomas Gregoire**

Title: **Chair**

Academic unit: **Physics**

Date **Dec. 20 2023**

Notes:

## STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new **Earth Sciences Honors program with a concentration in Environmental Geosciences**. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

Because the parts of the curriculum choices outside the Earth Sciences department consist of choices from a palette of different courses in different units, and the total number of students involved is expected to be moderate (we estimate 5-10 students per year), the class sizes in the cognate departments will not be affected in any material way.

I support this change unconditionally.

I do not support this change.

I support this change, with the following reservations:

As Director of the Institute of Environmental and Interdisciplinary Science, I have no concerns with this new concentration (in fact – I am fully supportive). We have an Environmental Science degree with a concentration in Earth Sciences but the new proposed degree reflects the fact that for some career paths there is need for more emphasis on Earth Sciences but through an environmental lens.

The only reason for listing a “reservation” is that there have been preliminary discussions re potentially changing the name of the unit (Earth Sciences) to something else that may include the word “environmental”. If that were to be the case we have some concerns re confusion for potential applicants. Quite simply, although we are in support of this new concentration that does not mean tacit approval for a unit-level name change without significant discussion and thought.

Steven J. Cooke

Director of the Institute of Environmental and Interdisciplinary Science

January 10, 2024

## STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new Earth Sciences Honors program with a concentration in Environmental Geosciences. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

Because the parts of the curriculum choices outside the Earth Sciences department consist of choices from a palette of different courses in different units, and the total number of students involved is expected to be moderate (we estimate 5-10 students per year), the class sizes in the cognate departments will not be affected in any material way.

I support this change unconditionally.  I do not support this change

I support this change, with the following reservations:

Signature:



Name: Seán Barry

Title: Professor and Chair

Academic unit: Chemistry

Date: 2023/12/14

Notes: 7



STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new **Earth Sciences Honors program with a concentration in Environmental Geosciences**. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

Because the parts of the curriculum choices outside the Earth Sciences department consist of choices from a palette of different courses in different units, and the total number of students involved is expected to be moderate (we estimate 5-10 students per year), the class sizes in the cognate departments will not be affected in any material way.

I support this change unconditionally.

I do not support this change.

I support this change, with the following reservations:

Signature:



Name: Robert Burk

Title: Interim Director

Academic unit: School of Math and Stats

Date: December 12, 2023

Notes:

STATEMENT OF SUPPORT FROM SISTER UNIT

RE: The proposed modification is the introduction of a new **Earth Sciences Honors program with a concentration in Environmental Geosciences**. All Honors Earth Sciences programs are designed to cover the knowledge requirements of the Professional Geoscientists of Ontario (PGO), which is a professional society to which all practicing geoscientists must belong. The PGO recognizes three streams of education and workplace experience: Geology, Environmental Geoscience, and Geophysics. Current programs provide curricula geared towards either Geology or Geophysics, but not Environmental Geoscience. The new program is designed to rectify this gap, providing members of the Earth Sciences department with a direct route to professional registration.

Because the parts of the curriculum choices outside the Earth Sciences department consist of choices from a palette of different courses in different units, and the total number of students involved is expected to be moderate (we estimate 5-10 students per year), the class sizes in the cognate departments will not be affected in any material way.

- I support this change unconditionally.  
 I do not support this change.  
 I support this change, with the following reservations:

Signature:



Name: Annie Larivée

Title: Chair

Academic unit: Department of Philosophy

Date: Dec. 12, 2023

Notes:

# New Program Proposal

Date Submitted: 03/27/24 8:44 am

Viewing: **TBD-2226 : Earth Sciences with Concentration in Environmental Geosciences**

Last edit: 05/23/24 11:55 am

Last modified by: nataliephelan

[Changes proposed by: kristinjallen](#)

## In Workflow

1. **ERTH ChairDir UG**
2. **SCI Dean**
3. **SCI FCC**
4. **SCI FBoard**
5. **PRE SCCASP**
6. **SCCASP**
7. **SQAPC**
8. Senate
9. PRE CalEditor
10. CalEditor

## Approval Path

1. 09/19/23 3:02 pm  
Natalie Phelan  
(nataliephelan):  
Approved for CalEditor
2. 09/20/23 1:59 pm  
James Mungall  
(jamesmungall):  
Approved for EARTH  
ChairDir UG
3. 10/13/23 2:28 pm  
Julia Wallace  
(juliawallace): Approved  
for SCI Dean
4. 11/07/23 1:39 pm  
Julia Wallace  
(juliawallace): Approved  
for SCI FCC
5. 11/07/23 1:58 pm  
Julia Wallace  
(juliawallace): Approved  
for SCI FBoard
6. 03/05/24 10:28 am  
Natalie Phelan  
(nataliephelan):  
Approved for PRE  
SCCASP
7. 03/06/24 12:40 pm  
Erika Strathearn  
(erikastrathearn):  
Rollback to PRE SCCASP  
for SCCASP
8. 03/22/24 1:01 pm  
Natalie Phelan  
(nataliephelan): Rollback  
to Initiator

- 9. 03/27/24 9:12 am  
Tim Patterson  
(timpatterson): Approved  
for EARTH ChairDir UG
- 10. 04/10/24 11:58 am  
Julia Wallace  
(juliawallace): Approved  
for SCI Dean
- 11. 04/10/24 11:59 am  
Julia Wallace  
(juliawallace): Approved  
for SCI FCC
- 12. 04/10/24 11:59 am  
Julia Wallace  
(juliawallace): Approved  
for SCI FBoard
- 13. 04/10/24 1:38 pm  
Erika Strathearn  
(erikastrathearn):  
Approved for PRE  
SCCASP
- 14. 04/16/24 11:26 am  
Erika Strathearn  
(erikastrathearn):  
Approved for SCCASP

Effective Date	2025-26
Workflow	majormod
Program Code	TBD-2226
Level	Undergraduate
Faculty	Faculty of Science
Academic Unit	Department of Earth Sciences
Degree	Bachelor of Science Honours
Title	Earth Sciences with Concentration in Environmental Geosciences

## Program Requirements

---

### Earth Sciences with Concentration in Environmental Geosciences B.Sc. Honours (20.5 credits)

A. Credits Included in the Major CGPA (11.5 credits)

**1. 1.0 credit in:**

1.0

- [ERTH 1006](#) [0.5]      Exploring Planet Earth
- [ERTH 1009](#) [0.5]      The Earth System Through Time

<b>2. 3.5 credits in:</b>		3.5
<a href="#"><u>ERTH 2102</u></a> [0.5]	Mineralogy to Petrology	
<a href="#"><u>ERTH 2104</u></a> [0.5]	Igneous Systems, Geochemistry and Processes	
<a href="#"><u>ERTH 2105</u></a> [0.5]	Geodynamics	
<a href="#"><u>ERTH 2314</u></a> [0.5]	Sedimentation and Stratigraphy	
<a href="#"><u>ERTH 2406</u></a> [0.5]	Geology and Map Interpretation	
<a href="#"><u>ERTH 2802</u></a> [0.5]	Field Geology I	
<a href="#"><u>GEOG 2013</u></a> [0.5]	Weather and Water	
<b>3. 1.0 credit from:</b>		1.0
<a href="#"><u>ERTH 2312</u></a> [0.5]	Paleontology	
<a href="#"><u>ERTH 3204</u></a> [0.5]	Mineral Deposits	
<a href="#"><u>ERTH 3207</u></a> [0.5]	Metamorphic Petrology and Processes	
<b>4. 0.5 credit from:</b>		0.5
<a href="#"><u>ERTH 3203</u></a> [0.5]	Sedimentology	
<a href="#"><u>ERTH 3206</u></a> [0.5]	Sedimentary Depositional Systems	
<b>5. 2.5 credits in:</b>		2.5
<a href="#"><u>ERTH 3003</u></a> [0.5]	Geochemistry and Geochronology	
<a href="#"><u>ERTH 3205</u></a> [0.5]	Physical Hydrogeology	
<a href="#"><u>ERTH 3405</u></a> [0.5]	Geophysical Methods	
<a href="#"><u>ERTH 3806</u></a> [0.5]	Structural Geology	
<a href="#"><u>GEOG 3108</u></a> [0.5]	Soil Properties	
<b>6. 0.5 credit in:</b>		0.5
<a href="#"><u>ERTH 4006</u></a> [0.5]	Field Environmental Geobiology	
<b>7. 0.5 credit from:</b>		0.5
<a href="#"><u>ERTH 4008</u></a> [0.5]	Topics in Paleobiology and Evolution	
<a href="#"><u>ERTH 4206</u></a> [0.5]	Contaminant and Remediation Hydrogeology	
<a href="#"><u>ERTH 4815</u></a> [0.5]	Natural Hazards in Canada	
<b>8. 1.0 credit in EARTH at the 4000-level</b>		1.0
<b>9. 1.0 credit from:</b>		1.0
<a href="#"><u>ERTH 4908</u></a> [1.0]	Honours Thesis	
<a href="#"><u>ERTH 4909</u></a> [0.5]	Research in Earth Sciences (and 0.5 credit in EARTH at the 4000 level)	
*See Note 1 below		
B. Credits Not Included in the Major CGPA (9.0 credits)		
<b>10. 1.0 credit in:</b>		1.0
<a href="#"><u>MATH 1007</u></a> [0.5]	Elementary Calculus I	
<a href="#"><u>MATH 1107</u></a> [0.5]	Linear Algebra I	
<b>11. 1.0 credit in:</b>		1.0
<a href="#"><u>CHEM 1001</u></a> [0.5]	General Chemistry I	
<a href="#"><u>CHEM 1002</u></a> [0.5]	General Chemistry II	
<b>12. 1.0 credit in:</b>		1.0
<a href="#"><u>PHYS 1007</u></a> [0.5]	Elementary University Physics I	
<a href="#"><u>PHYS 1008</u></a> [0.5]	Elementary University Physics II	
<b>13. 2.0 credits in:</b>		2.0
<a href="#"><u>BIOL 1103</u></a> [0.5]	Foundations of Biology I	
<a href="#"><u>BIOL 1104</u></a> [0.5]	Foundations of Biology II	
<a href="#"><u>COMP 1005</u></a> [0.5]	Introduction to Computer Science I	

<a href="#">STAT 2507</a> [0.5]	Introduction to Statistical Modeling I	
<b>14. 1.0 credit in</b>	Science Continuation Courses (not EARTH)	<b>1.0</b>
<a href="#">BIOL 2600</a> [0.5]	Ecology	
<a href="#">BIOL 3601</a> [0.5]	Ecosystems and Environmental Change	
<a href="#">CHEM 2302</a> [0.5]	Analytical Chemistry I	
<a href="#">CHEM 2303</a> [0.5]	Analytical Chemistry II	
<a href="#">CHEM 2800</a> [0.5]	Foundations for Environmental Chemistry	
<a href="#">CHEM 3305</a> [0.5]	Advanced Analytical Chemistry Laboratory	
<a href="#">CHEM 3800</a> [0.5]	The Chemistry of Environmental Pollutants	
<a href="#">GEOG 3103</a> [0.5]	Watershed Hydrology	
<a href="#">GEOG 3104</a> [0.5]	Principles of Biogeography	
<a href="#">GEOG 3105</a> [0.5]	Climate and Atmospheric Change	
<a href="#">GEOG 3106</a> [0.5]	Aquatic Science and Management	
<b>15. 1.5 credits in:</b>		<b>1.5</b>
<a href="#">ERTH 2004</a> [0.5]	Maps, Satellites and the Geospatial Revolution	
<a href="#">ERTH 2402</a> [0.5]	Climate Change: An Earth Sciences Perspective	
<a href="#">PHIL 2380</a> [0.5]	Introduction to Environmental Ethics	
<b>16. 1.0 credit in</b>	approved courses outside the faculty of Science and Engineering and Design	<b>1.0</b>
<b>17. 0.5 credit in</b>	free electives.	<b>0.5</b>
Total Credits		<b>20.5</b>

**Note 1:** the thesis ([ERTH 4908](#)) or research project ([ERTH 4909](#)) is to be undertaken in the field of Environmental Geoscience.

New Resources	No New Resources
Summary	Add new program BSc Earth Sciences Honours with concentration in Environmental Geosciences
Rationale	This new program will fill a gap in the market, to help prepare students to become professional environmental geoscientists upon graduation. Currently there is no specialized program in the Department like this, which is PGO compliant.
Transition/Implementation	Advising will be done by the Undergrad Admin and Faculty UG advisor. The Department will let Admissions and Academic Advising know about the new program.  *New edit March 27-replacing NSCI 1000 with BIOL 1103 to fix the pre-requisite concerns from BIOL and GEOG departments.

Program reviewer comments

**nataliephelan (10/20/23 1:10 pm):** Added credit totals.  
**nataliephelan (10/23/23 12:31 pm):** Added title and total credit count.  
**nataliephelan (12/01/23 9:43 am):** Arranged items 14 and 15 into alpha-numeric order.  
**nataliephelan (03/05/24 12:14 pm):** Changed eff date to 25-26. Viewbook mod in the 24-25 cycle.  
**erikastrathearn (03/06/24 12:40 pm):** Rollback: Not approved at SCCASP, to be discussed at SQUAPC first and brought back to SCCASP based on concerns brought forward.  
**nataliephelan (03/22/24 1:01 pm):** Rollback: Further edits  
**nataliephelan (05/17/24 1:15 pm):** At the request of the department, created a new item #6 for EARTH 4006 which is now mandatory; adjusted the newly renumbered item #7 to keep the overall credit total correct, and renumbered the remaining items. Changes made as a result of SQAPC feedback.  
**nataliephelan (05/23/24 11:55 am):** At the request of SQAPC, added a note to clarify that the capstone component is to be undertaken in the area of the concentration.

## MEMORANDUM

**To:** Vice-President's Academic and Research Committee (VPARC)

**From:**

Audra A. Diptée, Coordinator of Latin America and Caribbean Studies  
Julie Garlen, Director of the Institute of Interdisciplinary Studies

**CC:**

Anne Bowker (Dean of FASS)  
Paul Keen (Associate Dean of Faculty Affairs)  
James Miller (Chair of History)

**Date:** April 28, 2024

**Subject:** Change in Governance: Latin America & Caribbean Studies

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### **Description of change**

The Latin American and Caribbean Studies (LACS) program is requesting that it be moved from the Department of History to the Institute of Interdisciplinary Studies (IIS).

It was housed in IIS until 2018 when it was moved to the Department of History. However, as LACS is an interdisciplinary program, it is much better suited to IIS where it will be among other programs committed to interdisciplinarity.

There will be no change to the program structure and mode of delivery.

**Context:** In 2018, the LACS program was moved to the Department of History which has served as its *administrative* home. Decisions concerning the *academic programs* in LACS are the responsibility of the LACS Management committee which is comprised of faculty members from various departments who are affiliated with the program (further details can be found in under the section addressing Governance).

LACS launched its collaborative Masters program in the 2020/2021 academic year. This program allows students in affiliated departments to specialize in Latin American and Caribbean Studies. The programs currently affiliated are as follows: *History, Political Science, Political Economy, Women and Gender Studies, Geography, Anthropology and Sociology, and International Affairs.*

### **Impact on Other Programs**

The proposed governance change will have a minimal impact on other programs and/or units at Carleton, including the Institute of Interdisciplinary Studies. A part-time graduate programs

administrator has been hired and is currently being housed in IIS, sharing office space with another part-time graduate programs administrator, so sufficient administrative space is available. The current Institute Administrator will be the direct staff supervisor for the admin position, and the Director will assume the responsibility of manager. These additions will have a minimal impact on administrative responsibilities as the LACS staff member will primarily be working directly with the program director, who has already been engaged in overseeing the program and facilitating administrative needs. The Institute Administrator and Director will oversee work as needed and incorporate the LACS staff member into the departmental team.

The move of LACS will not involve faculty supervision, as LACS faculty are housed in other units across campus. Therefore, the impact on human resources will be minimal and the administration of other programs will not be affected. However, housing LACS in IIS will be beneficial in that IIS faculty will enjoy greater access to graduate students and opportunities to contribute courses and research expertise. LACS fits well with the interdisciplinary nature of the existing programs in IIS.

### **Resources**

This change will not affect resources.

- There will be *no* change to the Dean and Faculty affiliation.
- There will be *no* change to faculty affiliations or workload.
- There will be *no* affect to the level of administrative support provided to students. The administrators will report to the Director of the Institute of Interdisciplinary Studies and work closely with the Coordinator of the Latin American and Caribbean Studies program.
- **Space:** As LACS is an interdisciplinary program with faculty over 35 faculty members who are in different departments, there is no need to relocate faculty or students.



**Appendix A:**

***C: GOVERNANCE***

**Governance**

**Coordinator:** The LACS coordinator is the faculty member responsible for managing the LACS undergraduate and graduate programs according to the decisions made by the LACS Steering Committee. The coordinator serves a (renewable) three-year term and serves at the pleasure of the LACS Steering Committee. The coordinator is appointed by the Dean of FASS. The coordinator receives a 0.5 course reduction annually. The coordinator will also serve as the Chair of the LACS Steering Committee and will report to the committee at least once per semester.

**Steering Committee:** The steering committee is responsible for making decisions related to program affairs. It consists of five members. Committee members serve rotating three-year (renewable) terms and are nominated by participating LACS faculty.

The steering committee's duties include oversight of curriculum and managing program related matters concerning the minor, the BGINs LACS specialization, and the MA LACS specialization. This includes the assessment and development of learning outcomes. Proposed changes made by the steering committee are circulated to the larger community of LACS-affiliated faculty for feedback and comments as necessary.

**Admissions Committee (MA Program):** The steering committee will serve this role. The committee will receive and assess student applications.

**Institute of Interdisciplinary Studies:** The Director of the Institute of Interdisciplinary Studies will serve in an advisory capacity concerning administrative and program matters. All LACS program decisions are left to the LACS steering committee.

**Student Participation:** Given that LACS is such a relatively small program, it has not yet implemented a system for student participation in the governance structures. To get student input, LACS does in-person exit interviews with all graduate students who have taken the required courses (LACS 5000 and LACS 5800). The purpose of these interviews is to get feedback from students. At the undergraduate level, all students specializing in LACS are also invited to meet with the LACS faculty coordinator each academic year for input. Students who have registered in LACS undergraduate course (LACS 1001, 1002, 4001, 4819) are invited to participate in an online survey (even if they are not registered in the LACS specialization).