## Requirements Information

**Invalid Combinations**
Yes,

**List of Invalid Combinations**

Geography and Environmental Management Minor

Geography and Environmental Management (Joint Honours)

Geomatics (Joint Honours)

**Average Requirement**
Yes,

Proposed

**Minimum Average(s) Required**

- A minimum cumulative overall average of 65.0%.
- A minimum cumulative special major average of 60.0% in all BIOL, CHEM, EARTH, MATH, and PHYS courses.
- A minimum cumulative major average of 70.0% in all AVIA, ENVS, GDS, and GEOG courses.

Existing

**Minimum Average(s) Required**

- A minimum cumulative overall average of 65.0%.
- A minimum cumulative special major average of 60.0% in all BIOL, CHEM, EARTH, MATH, and PHYS courses.
- A minimum cumulative major average of 70.0% in all ENVS and GEOG courses.

Proposed

**Graduation Requirements**

**Unit Requirements**

- Complete a total of 20.0 units:
  - 12.0 units of required courses.
  - 2.0 units of approved courses.
  - 6.0 units of elective courses
- A minimum of 14.5 units must be at the 200-level or above.

**Undergraduate Communications Requirement**

Students are required to complete ENVS131 with a final grade of 60.0% or higher to meet the Undergraduate Communication Requirement (UCR). The UCR milestone on a student's academic record will indicate one of the following rules has been met:

1. ENVS131 has been completed with a final grade of 60.0% or higher.
2. The UCR milestone has been earned by the student while enrolled in another University of Waterloo faculty.
3. At time of admission to the Faculty of Environment, a transfer credit from an external accredited post-secondary institution has been granted for ENVS131.

**Notes**

1. If a grade of 60.0% or higher is not achieved in ENVS131, a student will be eligible to repeat the course to meet the UCR milestone requirement. See Faculty of Environment Regulations for information on repeating courses.
2. Earning an UCR milestone and the satisfactory completion of ENVS131 are two unique and distinct degree requirements. Both requirements must be satisfied to be eligible for a Faculty of Environment, Bachelor of Science degree.
3. Students who have not attained the UCR milestone by the end of their 2B term must meet with their academic advisor to discuss the completion of this requirement.

Existing

**Graduation Requirements**

**Unit Requirements**

- Complete a total of 20.0 units:
  - 14.5 units of required courses.
  - 2.0 units of approved courses.
  - 3.5 units of elective courses; 2.0 units must be at the 300-level or above.
- A minimum of 14.5 units must be at the 200-level or above.

**Undergraduate Communications Requirement**

Students are required to complete ENVS131 with a final grade of 60.0% or higher to meet the Undergraduate Communication Requirement (UCR). The UCR milestone on a student's academic record will indicate one of the following rules has been met:

1. ENVS131 has been completed with a final grade of 60.0% or higher.
2. The UCR milestone has been earned by the student while enrolled in another University of Waterloo faculty.
3. At time of admission to the Faculty of Environment, a transfer credit from an external accredited post-secondary institution has been granted for ENVS131.

**Notes**

1. If a grade of 60.0% or higher is not achieved in ENVS131, a student will be eligible to repeat the course to meet the UCR milestone requirement. See Faculty of Environment Regulations for information on repeating courses.
2. Earning an UCR milestone and the satisfactory completion of ENVS131 are two unique and distinct degree requirements. Both requirements must be satisfied to be eligible for a Faculty of Environment, Bachelor of Science degree.

3. Students who have not attained the UCR milestone by the end of their 2B term must meet with their academic advisor to discuss the completion of this requirement.

Proposed

**Co-operative Education Program Requirements**

1. Complete a minimum of four credited work terms:
    1. A minimum of three must be standard work terms.
2. Complete a minimum of four Professional Development (PD) courses:
    1. PD1: Must be taken in an academic term prior to the first work term.
    2. PD12: Must be taken during the first work term.
    3. Two additional PD courses: To be taken during the second, third, or fourth work terms.

**Additional Constraints and Notes**

1. Students missing a co-op requirement by the end of their 3B term will normally be removed from co-op, unless they have successfully been employed for four work terms. These students will remain in co-op but will not be eligible for a co-op degree.
2. Students not meeting their plan's co-op requirements may be considered for transfer to another Faculty of Environment academic regular plan.
3. PD courses are graded with either a CR (credit granted) or NCR (failed, no credit granted). There are no numerical values associated with these grades, and therefore they will not be used in plan average calculations. The unit weighting for PD courses is not counted towards the total minimum unit degree requirements for any Faculty of Environment academic plan.
4. See the table below for the sequencing of academic and work terms. Transfer students may be required to follow a different sequencing.

**Legend for Study/Work Sequence Chart**

| Key | Description |
|---|---|
| F,W,S | Terms: F=September-December; W=January-April; S=May-August |
| 1,2,3,4 plus A or B | Academic year and term. |
| WT | Scheduled work term. |
| off | Neither an academic term nor a work term. |

**Study/Work Sequence Chart**

| F | W | S | F | W | S | F | W | S | F | W | S | F | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 1B | off | 2A | WT | 2B | WT | 3A | WT | 3B | WT | WT | 4A | 4B |

Existing

**Co-operative Education Program Requirements**

1. Complete a minimum of four credited work terms:
    1. A minimum of three must be standard work terms.
2. Complete a minimum of four Professional Development (PD) courses:
    1. PD1: Must be taken in an academic term prior to the first work term.
    2. PD12: Must be taken during the first work term.
    3. Two additional PD courses: To be taken during the second, third, or fourth work terms.

**Additional Constraints and Notes**

1. Students missing a co-op requirement by the end of their 3B term will normally be removed from co-op, unless they have successfully been employed for four work terms. These students will remain in co-op but will not be eligible for a co-op degree.
2. Students not meeting their plan's co-op requirements may be considered for transfer to another Faculty of Environment academic regular plan.
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4. See the table below for the sequencing of academic and work terms. Transfer students may be required to follow a different sequencing.

**Legend for Study/Work Sequence Chart**

| Key | Description |
|---|---|
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| 1,2,3,4 plus A or B | Academic year and term. |
| WT | Scheduled work term. |
| off | Neither an academic term nor a work term. |

**Study/Work Sequence Chart**

| F | W | S | F | W | S | F | W | S | F | W | S | F | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 1B | off | 2A | WT | 2B | WT | 3A | WT | 3B | 4A | WT | WT | 4B |

1. Required Courses
   - **11Units to Complete**
   - 
   - Complete all of the following
   - Complete all the following:
   - EARTH121 - Introductory Earth Sciences (0.50)
   - ENVS131 - Communications for Environmental Professions (0.50)
   - ENVS178 - Environmental Applications of Data Management and Statistics (0.50)
   - ENVS195 - Introduction to Environmental Studies (0.50)
   - ENVS200 - Field Ecology (0.50)
   - ENVS278 - Applied Statistics for Environmental Research (0.50)
   - GEOG102 - Global Environmental Systems: Processes and Change (0.50)
   - GEOG181 - Designing Effective Maps (0.50)
   - GEOG205 - Principles of Geomorphology (0.50)
   - GEOG209 - Hydroclimatology (0.50)
   - **Course Not Found**
   - GEOG417 - Climate Change Communication (0.50)
   - **Course Not Found**
   - 
   - Complete 1 of the following:
   - BIOL220 - Introduction to Plant Structure and Function (0.50)
   - BIOL240 - Fundamentals of Microbiology (0.50)
   - 

- Complete 1 of the following:
- CHEM120 - General Chemistry 1 (0.50)
- PHYS111 - Physics 1 (0.50)
-
- Complete 1 of the following:
- **GEOG202 - Geography of the Global Economy (0.50)**
- **GEOG225 - Global Environment and Health (0.50)**
-
- Complete 1 of the following:
- GEOG207 - Climate Change Fundamentals (0.50)
- **Course Not Found**
-
- Complete 1 of the following:
- GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
- PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
- GEOG271 - Earth from Space Using Remote Sensing (0.50)
-
- **Complete 3 of the following:**
- **Course Not Found**
- **Course Not Found**
- GEOG303 - Physical Hydrology (0.50)
- **GEOG304 - Carbon in the Biosphere (0.50)**
- GEOG305 - Fluvial Geomorphology (0.50)
- GEOG320 - The Cryosphere (0.50)
- **SCI201 - Global Warming and Climate Change (0.50)**
-
- **Complete 2 of the following:**
- GEOG307 - Societal Adaptation to Climate Change (0.50)
- **GEOG314 - Climate Services (0.50)**
- **GEOG359 - Low Carbon Transition (0.50)**
-
- Complete 1 of the following:
- MATH104 - Introductory Calculus for Arts and Social Science (0.50)
- MATH127 - Calculus 1 for the Sciences (0.50)
-
- **Grand Total Units: 11**
- ~~14.5Units to Complete~~
- ~~GEOG203 - Environment and Development in a Global Perspective (0.50)~~
- ~~GEOG294 - Approaches to Research in Physical Geography (0.50)~~
- ~~GEOG309 - Physical Climatology (0.50)~~
- ~~GEOG310 - Geodesy and Surveying (0.50)~~
- ~~GEOG391 - Field Research (0.50)~~
- ~~BIOL251 - Fundamentals of Ecology (0.50)~~
- ~~ERS484 - Soil Ecosystem Dynamics (0.50)~~
- ~~GEOG403 - Eutrophication: From Process to Water-Quality Management (0.50)~~
- ~~GEOG404 - Soil Ecosystem Dynamics (0.50)~~
- ~~GEOG405 - Wetlands (1.00)~~
- ~~GEOG459 - Energy and Sustainability (1.00)~~
- ~~Grand Total Units: 14.5~~

**Course Requirements (no units)**

Required Courses

- No Rules

1. Approved Courses List
    - 
    - Complete all of the following
    - Complete 2.0 units from the following list.
    - Choose any of the following:
    - **BIOL462 - Applied Wetland Science (0.50)**
    - **EARTH444 - Applied Wetland Science (0.50)**
    - **Course Not Found**
    - **ERS484 - Soil Ecosystem Dynamics (0.50)**
    - **Course Not Found**
    - **GEOG403 - Eutrophication: From Process to Water-Quality Management (0.50)**
    - **GEOG404 - Soil Ecosystem Dynamics (0.50)**
    - GEOG407 - Environmental Hydrology of Terrestrial Ecosystems (0.50)
    - GEOG408 - Earth's Future Climates (0.50)
    - GEOG420 - Ice Sheets and Glaciers (0.50)
    - **GEOG457 - Wildfire and Landscape Change (0.50)**
    - GEOG490B - Honours Thesis Completion (1.00)
    - ~~GEOG409 - Energy Balance Climatology (0.50)~~
    - ~~GEOG452 - Climate Change and Environment Project (1.00)~~

**Are there cross-listed courses listed in requirements?**

Yes,

**Cross-Listings Options**

All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. Students must take GEOG490A if intending to take GEOG490B; GEOG490A will count as an elective.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. Students must take GEOG490A if intending to take GEOG490B; GEOG490A will count as a 300-level or above elective.

Proposed

**Notes**

- GEOG202 provides a strong foundation for the Economy & Society Specialization, wherein GEOG225 provides a strong foundation for the Environment, Society, & Well-Being Specialization. Students interested in either or both these specializations are encouraged to complete the respective foundational course(s).
- See list of academic advisors.
- See Geography and Environmental Management website for recommended course sequences.

Existing

**Notes**

- See list of academic advisors.
- See Geography and Environmental Management website for recommended course sequences.

## Specializations

**Specializations for this Major**
Yes - Optional,

Proposed

**Specialization Details**

Students may choose to focus their elective choices by completing two of five available specializations.

Existing

**Specialization Details**

Students may choose to focus their elective choices by completing one of three available specializations.

1. CEC-Aviation Specialization, CEC-Economy & Society Specialization,
    - **Not Found**
    - **, CEC-Geomatics Specialization, or**
    - **Not Found**

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# G-Earth Systems Science Specialization - Earth Systems Science Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**

Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the GEM and Aviation programs.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the earth systems science specialization, there was consensus that students should achieve foundational knowledge in geomorphology and hydroclimatology (achieved by the pre-req required to take upper-year courses in the specialization: GEOG 205 and GEOG 209), as well as foundations at the 300-level in each of these streams. Degree requirements have been adjusted to reflect this curriculum.

Additional constraints removed since the thesis will no longer count towards the specialization.
Total units will be 2.5 units once GEOG405 proposal to cross-list the course with EARTH444 and BIOL462, which will lessen the unit weight from 1.0 to 0.50, is approved.

Related agenda proposals:

- GA-Earth Systems Science Specialization
- GEM-Earth Systems Science Specialization
- EARTH444
- BIOL462
- GEOG405
- GEOG402

**Consultations (Departmental)**

Consultations with Earth Sciences and the Associate Dean, Undergraduate in Science have taken place regarding the use of EARTH courses, and cross-listed options.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

**Program/Plan Name**
Earth Systems Science Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geomatics

**Admissions Entry Point**

Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a total of 2.5 units.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

**Course Requirements (units)**

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - 
    - Complete all of the following
    - Complete 1 of the following:
    - GEOG303 - Physical Hydrology (0.50)
    - GEOG320 - The Cryosphere (0.50)
    - 
    - Complete 1 of the following:
    - **Course Not Found**
    - GEOG304 - Carbon in the Biosphere (0.50)
    - GEOG305 - Fluvial Geomorphology (0.50)
    - 
    - Complete 2 of the following:
    - **BIOL462 - Applied Wetland Science (0.50)**
    - **EARTH444 - Applied Wetland Science (0.50)**
    - ERS484 - Soil Ecosystem Dynamics (0.50)
    - **Course Not Found**
    - **GEOG403 - Eutrophication: From Process to Water-Quality Management (0.50)**
    - GEOG404 - Soil Ecosystem Dynamics (0.50)
    - GEOG407 - Environmental Hydrology of Terrestrial Ecosystems (0.50)
    - GEOG420 - Ice Sheets and Glaciers (0.50)
    - GEOG453 - Urban Stormwater Management (0.50)
    - **GEOG457 - Wildfire and Landscape Change (0.50)**
    - PLAN453 - Urban Stormwater Management (0.50)
    - 
    - **Complete 1 additional course from any of the above course lists.**
    - ~~Complete all the following:~~
    - ~~ENVS200 - Field Ecology (0.50)~~
    - ~~GEOG205 - Principles of Geomorphology (0.50)~~
    - ~~GEOG209 - Hydroclimatology (0.50)~~
    - ~~GEOG405 - Wetlands (1.00)~~
    - ~~Complete 1 of the following~~
    - ~~ERS456 - Transforming Canadian Resource Management (1.00)~~
    - ~~GEOG456 - Transforming Canadian Resource Management (1.00)~~
    - ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~GEOG368 - Ecology and Conservation for Planning (0.50)~~
    - ~~PLAN341 - Ecology and Conservation for Planning (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~Complete 4 of the following:~~
    - ~~GEOG300 - Geomorphology and the Southern Ontario Environment (0.50)~~
    - ~~GEOG309 - Physical Climatology (0.50)~~
    - ~~GEOG408 - Earth's Future Climates (0.50)~~
    - ~~GEOG409 - Energy Balance Climatology (0.50)~~
    - ~~GEOG418 - Cold Region Climates (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG405 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# GA-Earth Systems Science Specialization - Earth Systems Science Specialization

Top

## Effective Date and Career

**Career**
Proposed

Undergraduate,

Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the GEM and Geomatics programs.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the earth systems science specialization, there was consensus that students should achieve foundational knowledge in geomorphology and hydroclimatology (achieved by the pre-reqs required to take upper-year courses in the specialization: GEOG205 and GEOG209), as well as foundations at the 300-level in each of these streams. Degree requirements have been adjusted to reflect this curriculum.

Additional constraints removed since the thesis will no longer count towards the specialization.
Total units will be 2.5 units once GEOG405 proposal to cross-list the course with EARTH444 and BIOL462, which will lessen the unit weight from 1.0 to 0.50, is approved.
Related agenda proposals:

- G-Earth Systems Science Specialization
- GEM-Earth Systems Science Specialization
- EARTH444
- BIOL462
- GEOG405
- GEOG402

**Consultations (Departmental)**

Consultations with Earth Sciences and the Associate Dean, Undergraduate in Science have taken place regarding the use of EARTH courses, and cross-listed options.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

**Program/Plan Name**
Earth Systems Science Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geography & Aviation

**Admissions Entry Point**

Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a total of 2.5 units.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

**Course Requirements (units)**

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - 
    - Complete all of the following
    - Complete 1 of the following:
    - GEOG303 - Physical Hydrology (0.50)
    - GEOG320 - The Cryosphere (0.50)
    - 
    - Complete 1 of the following:
    - **Course Not Found**
    - GEOG304 - Carbon in the Biosphere (0.50)
    - GEOG305 - Fluvial Geomorphology (0.50)
    - 
    - Complete 2 of the following:
    - **BIOL462 - Applied Wetland Science (0.50)**
    - **EARTH444 - Applied Wetland Science (0.50)**
    - ERS484 - Soil Ecosystem Dynamics (0.50)
    - **Course Not Found**
    - **GEOG403 - Eutrophication: From Process to Water-Quality Management (0.50)**
    - GEOG404 - Soil Ecosystem Dynamics (0.50)
    - GEOG407 - Environmental Hydrology of Terrestrial Ecosystems (0.50)
    - GEOG420 - Ice Sheets and Glaciers (0.50)
    - GEOG453 - Urban Stormwater Management (0.50)
    - **GEOG457 - Wildfire and Landscape Change (0.50)**
    - PLAN453 - Urban Stormwater Management (0.50)
    - 
    - **Complete 1 additional course from any of the above course lists.**
    - ~~Complete all the following:~~
    - ~~ENVS200 - Field Ecology (0.50)~~
    - ~~GEOG205 - Principles of Geomorphology (0.50)~~
    - ~~GEOG209 - Hydroclimatology (0.50)~~
    - ~~GEOG405 - Wetlands (1.00)~~
    - ~~Complete 1 of the following~~
    - ~~ERS456 - Transforming Canadian Resource Management (1.00)~~
    - ~~GEOG456 - Transforming Canadian Resource Management (1.00)~~
    - ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~GEOG368 - Ecology and Conservation for Planning (0.50)~~
    - ~~PLAN341 - Ecology and Conservation for Planning (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~Complete 4 of the following:~~
    - ~~GEOG300 - Geomorphology and the Southern Ontario Environment (0.50)~~
    - ~~GEOG309 - Physical Climatology (0.50)~~
    - ~~GEOG408 - Earth's Future Climates (0.50)~~
    - ~~GEOG409 - Energy Balance Climatology (0.50)~~
    - ~~GEOG418 - Cold Region Climates (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG405 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# GEM-Earth Systems Science Specialization - Earth Systems Science Specialization

Top

## Effective Date and Career

**Career**
Proposed

Undergraduate,

Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the Aviation and Geomatics programs.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the earth systems science specialization, there was consensus that students should achieve foundational knowledge in geomorphology and hydroclimatology (achieved by the pre-req required to take upper-year courses in the specialization: GEOG 205 and GEOG 209), as well as foundations at the 300-level in each of these streams.

Degree requirements have been adjusted to reflect this curriculum.

Additional constraints removed since the thesis will no longer count towards the specialization.
Total units will be 2.5 units once GEOG405 proposal to cross-list the course with EARTH444 and BIOL462, which will lessen the unit weight from 1.0 to 0.50, is approved.
Related agenda proposals:

- G-Earth Systems Science Specialization
- GA-Earth Systems Science Specialization
- EARTH444
- BIOL462
- GEOG405
- GEOG402

**Consultations (Departmental)**

Consultations with Earth Sciences and the Associate Dean, Undergraduate in Science have taken place regarding the use of EARTH courses, and cross-listed options.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

**Program/Plan Name**
Earth Systems Science Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geography & Environmental Management, or JH-Geography & Environmental Management

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a total of 2.5 units.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

**Course Requirements (units)**

Required Courses

- 0Units to Complete

- No Rules

1. Required Courses
    - 
    - Complete all of the following
    - Complete 1 of the following:
    - GEOG303 - Physical Hydrology (0.50)
    - GEOG320 - The Cryosphere (0.50)
    - 
    - Complete 1 of the following:
    - **Course Not Found**
    - GEOG304 - Carbon in the Biosphere (0.50)
    - GEOG305 - Fluvial Geomorphology (0.50)
    - 
    - Complete 2 of the following:
    - **BIOL462 - Applied Wetland Science (0.50)**
    - **EARTH444 - Applied Wetland Science (0.50)**
    - ERS484 - Soil Ecosystem Dynamics (0.50)
    - **Course Not Found**
    - **GEOG403 - Eutrophication: From Process to Water-Quality Management (0.50)**
    - GEOG404 - Soil Ecosystem Dynamics (0.50)
    - GEOG407 - Environmental Hydrology of Terrestrial Ecosystems (0.50)
    - GEOG420 - Ice Sheets and Glaciers (0.50)
    - GEOG453 - Urban Stormwater Management (0.50)
    - **GEOG457 - Wildfire and Landscape Change (0.50)**
    - PLAN453 - Urban Stormwater Management (0.50)
    - 
    - **Complete 1 additional course from any of the above course lists.**
    - ~~Complete all the following:~~
    - ~~ENVS200 - Field Ecology (0.50)~~
    - ~~GEOG205 - Principles of Geomorphology (0.50)~~
    - ~~GEOG209 - Hydroclimatology (0.50)~~
    - ~~GEOG405 - Wetlands (1.00)~~
    - ~~Complete 1 of the following~~
    - ~~ERS456 - Transforming Canadian Resource Management (1.00)~~
    - ~~GEOG456 - Transforming Canadian Resource Management (1.00)~~
    - ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~GEOG368 - Ecology and Conservation for Planning (0.50)~~
    - ~~PLAN341 - Ecology and Conservation for Planning (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~Complete 4 of the following:~~
    - ~~GEOG300 - Geomorphology and the Southern Ontario Environment (0.50)~~
    - ~~GEOG309 - Physical Climatology (0.50)~~
    - ~~GEOG408 - Earth's Future Climates (0.50)~~
    - ~~GEOG409 - Energy Balance Climatology (0.50)~~
    - ~~GEOG418 - Cold Region Climates (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG405 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# CEC-Economy & Society Specialization - Economy and Development Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the Aviation, CEC and Geomatics programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**

Not Applicable,

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the economy and society specialization, there was consensus that students could focus on either economy/development themes or well-being themes. Hence it was decided to split the specializations into two separate streams (one for economy and development and a new specialization for well-being).

Additional constraints edited since thesis completion no longer counts towards a specialization.

Addition of note to provide a recommendation to students to take GEOG202, although not required.

Related agenda proposals:

- G-Economy & Society Specialization
- GA-Economy & Society Specialization
- GEM-Economy & Society Specialization

Note: The notation under Course Requirements (no units) will be removed upon approval of this proposal by SUC. Until then, it cannot be removed.

**Consultations (Departmental)**

Planning and SERS notified of cross-listed courses included in specialization

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

Proposed

**Program/Plan Name**
Economy and Development Specialization

Existing

**Program/Plan Name**
Economy and Society Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Climate & Environmental Change

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a minimum of 2.5 units.
  - 1.0 unit must be at the 400-level.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
    - **2.5 - 3.5Units to Complete**
    - 
    - **Complete 5 of the following:**
    - **ENVS220 - Ecological Economics (0.50)**
    - **ENVS401 - Canadian Law, Indigenous Peoples, and Natural Resource Development (0.50)**
    - **ERS456 - Transforming Canadian Resource Management (1.00)**
    - GEOG203 - Environment and Development in a Global Perspective (0.50)
    - GEOG311 - Economic Geography and Society (0.50)
    - **GEOG319 - Economic Analyses for Regional Planning (0.50)**
    - GEOG323 - Tourism Impacts - International Perspectives (0.50)
    - GEOG356 - Resources Management (0.50)
    - **GEOG368 - Ecology and Conservation for Planning (0.50)**
    - GEOG411 - The Digital Economy (0.50)
    - GEOG423 - Sustainable Tourism (0.50)
    - GEOG426 - Geographies of Development (0.50)
    - **GEOG456 - Transforming Canadian Resource Management (1.00)**
    - REC383 - Tourism Impacts - International Perspectives (0.50)
    - **PLAN320 - Economic Analyses for Regional Planning (0.50)**
    - **PLAN341 - Ecology and Conservation for Planning (0.50)**
    - 
    - **Grand Total Units: 2.5 - 3.5**
    - ~~5.5Units to Complete~~
    - ~~Complete all of the following~~
    - ~~Complete all the following:~~
    - ~~GEOG202 - Geography of the Global Economy (0.50)~~
    - ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
    - ~~GEOG415 - Economy and Society Project (1.00)~~
    - ~~Complete 4 of the following:~~
    - ~~ERS361 - Food Systems and Sustainability (0.50)~~
    - ~~GEOG219 - How Pandemics Change the World (0.50)~~
    - ~~GEOG222 - Geographical Study of Canada (0.50)~~
    - ~~GEOG225 - Global Environment and Health (0.50)~~
    - ~~GEOG233 - Geography of Tourism (0.50)~~
    - ~~GEOG302 - Geographies of Work and Employment (0.50)~~
    - ~~GEOG325 - Geographies of Health (0.50)~~
    - ~~GEOG336 - Space, Power, and Politics: Citizenship in a Changing World (0.50)~~
    - ~~GEOG349 - Urban Form and Spatial Structure (0.50)~~
    - ~~GEOG361 - Food Systems and Sustainability (0.50)~~
    - ~~GEOG436 - Feminist Economic Geography: Gender, Identities and Social Change (0.50)~~
    - ~~PLAN349 - Urban Form and Spatial Structure (0.50)~~
    - ~~Complete 2 of the following:~~
    - ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
    - ~~GEOG307 - Societal Adaptation to Climate Change (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~Grand Total Units: 5.5~~

1. Required Courses
    - 
    - No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG415 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# G-Economy & Society Specialization - Economy and Development Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the Aviation, CEC and Geomatics programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the economy and society specialization, there was consensus that students could focus on either economy/development themes or well-being themes. Hence it was decided to split the specializations into two separate streams (one for economy and development and a new specialization for well-being).

Additional constraints edited since thesis completion no longer counts towards a specialization.

Addition of note to provide a recommendation to students to take GEOG202, although not required.

Related agenda proposals:

- CEC-Economy & Society Specialization
- GA-Economy & Society Specialization
- GEM-Economy & Society Specialization

**Consultations (Departmental)**

Planning and SERS notified of cross-listed courses included in specialization

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

| Proposed |
| --- |
| **Program/Plan Name**<br>Economy and Development Specialization |
| Existing |
| **Program/Plan Name**<br>Economy and Society Specialization |

## Admissions

**Specialization is available for students in the following majors**

H-Geomatics

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a minimum of 2.5 units.
  - 1.0 unit must be at the 400-level.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
   - **2.5 - 3.5Units to Complete**
   - 
   - **Complete 5 of the following:**
   - **ENVS220 - Ecological Economics (0.50)**
   - **ENVS401 - Canadian Law, Indigenous Peoples, and Natural Resource Development (0.50)**
   - **ERS456 - Transforming Canadian Resource Management (1.00)**
   - GEOG203 - Environment and Development in a Global Perspective (0.50)
   - GEOG311 - Economic Geography and Society (0.50)

- **GEOG319 - Economic Analyses for Regional Planning (0.50)**
- GEOG323 - Tourism Impacts - International Perspectives (0.50)
- GEOG356 - Resources Management (0.50)
- **GEOG368 - Ecology and Conservation for Planning (0.50)**
- GEOG411 - The Digital Economy (0.50)
- GEOG423 - Sustainable Tourism (0.50)
- GEOG426 - Geographies of Development (0.50)
- **GEOG456 - Transforming Canadian Resource Management (1.00)**
- REC383 - Tourism Impacts - International Perspectives (0.50)
- **PLAN320 - Economic Analyses for Regional Planning (0.50)**
- **PLAN341 - Ecology and Conservation for Planning (0.50)**
-
- **Grand Total Units: 2.5 - 3.5**
- ~~5.5Units to Complete~~
- ~~Complete all of the following~~
- ~~Complete all the following:~~
- ~~GEOG202 - Geography of the Global Economy (0.50)~~
- ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
- ~~GEOG415 - Economy and Society Project (1.00)~~
- ~~Complete 4 of the following:~~
- ~~ERS361 - Food Systems and Sustainability (0.50)~~
- ~~GEOG219 - How Pandemics Change the World (0.50)~~
- ~~GEOG222 - Geographical Study of Canada (0.50)~~
- ~~GEOG225 - Global Environment and Health (0.50)~~
- ~~GEOG233 - Geography of Tourism (0.50)~~
- ~~GEOG302 - Geographies of Work and Employment (0.50)~~
- ~~GEOG325 - Geographies of Health (0.50)~~
- ~~GEOG336 - Space, Power, and Politics: Citizenship in a Changing World (0.50)~~
- ~~GEOG349 - Urban Form and Spatial Structure (0.50)~~
- ~~GEOG361 - Food Systems and Sustainability (0.50)~~
- ~~GEOG436 - Feminist Economic Geography: Gender, Identities and Social Change (0.50)~~
- ~~PLAN349 - Urban Form and Spatial Structure (0.50)~~
- ~~Complete 2 of the following:~~
- ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
- ~~GEOG307 - Societal Adaptation to Climate Change (0.50)~~
- ~~GEOG316 - Multivariate Statistics (0.50)~~
- ~~GEOG318 - Spatial Analysis (0.50)~~
- ~~PLAN351 - Multivariate Statistics (0.50)~~
- ~~PLAN353 - Spatial Analysis (0.50)~~
- ~~Grand Total Units: 5.5~~

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG415 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# GA-Economy & Society Specialization - Economy and Development Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the Aviation, CEC and Geomatics programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the economy and society specialization, there was consensus that students could focus on either economy/development themes or well-being themes. Hence it was decided to split the specializations into two separate streams (one for economy and development and a new specialization for well-being).

Additional constraints edited since thesis completion no longer counts towards a specialization.

Addition of note to provide a recommendation to students to take GEOG202, although not required.

Related agenda proposals:

- CEC-Economy & Society Specialization
- G-Economy & Society Specialization
- GEM-Economy & Society Specialization

**Consultations (Departmental)**

Planning and SERS notified of cross-listed courses included in specialization

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

Proposed

**Program/Plan Name**
Economy and Development Specialization

Existing

**Program/Plan Name**
Economy and Society Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geography & Aviation

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a minimum of 2.5 units.
  - 1.0 unit must be at the 400-level.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
   - **2.5 - 3.5Units to Complete**
   -

- **Complete 5 of the following:**
- **ENVS220 - Ecological Economics (0.50)**
- **ENVS401 - Canadian Law, Indigenous Peoples, and Natural Resource Development (0.50)**
- **ERS456 - Transforming Canadian Resource Management (1.00)**
- GEOG203 - Environment and Development in a Global Perspective (0.50)
- GEOG311 - Economic Geography and Society (0.50)
- **GEOG319 - Economic Analyses for Regional Planning (0.50)**
- GEOG323 - Tourism Impacts - International Perspectives (0.50)
- GEOG356 - Resources Management (0.50)
- **GEOG368 - Ecology and Conservation for Planning (0.50)**
- GEOG411 - The Digital Economy (0.50)
- GEOG423 - Sustainable Tourism (0.50)
- GEOG426 - Geographies of Development (0.50)
- **GEOG456 - Transforming Canadian Resource Management (1.00)**
- REC383 - Tourism Impacts - International Perspectives (0.50)
- **PLAN320 - Economic Analyses for Regional Planning (0.50)**
- **PLAN341 - Ecology and Conservation for Planning (0.50)**
-
- **Grand Total Units: 2.5 - 3.5**
- ~~5.5Units to Complete~~
- ~~Complete all of the following~~
- ~~Complete all the following:~~
- ~~GEOG202 - Geography of the Global Economy (0.50)~~
- ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
- ~~GEOG415 - Economy and Society Project (1.00)~~
- ~~Complete 4 of the following:~~
- ~~ERS361 - Food Systems and Sustainability (0.50)~~
- ~~GEOG219 - How Pandemics Change the World (0.50)~~
- ~~GEOG222 - Geographical Study of Canada (0.50)~~
- ~~GEOG225 - Global Environment and Health (0.50)~~
- ~~GEOG233 - Geography of Tourism (0.50)~~
- ~~GEOG302 - Geographies of Work and Employment (0.50)~~
- ~~GEOG325 - Geographies of Health (0.50)~~
- ~~GEOG336 - Space, Power, and Politics: Citizenship in a Changing World (0.50)~~
- ~~GEOG349 - Urban Form and Spatial Structure (0.50)~~
- ~~GEOG361 - Food Systems and Sustainability (0.50)~~
- ~~GEOG436 - Feminist Economic Geography: Gender, Identities and Social Change (0.50)~~
- ~~PLAN349 - Urban Form and Spatial Structure (0.50)~~
- ~~Complete 2 of the following:~~
- ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
- ~~GEOG307 - Societal Adaptation to Climate Change (0.50)~~
- ~~GEOG316 - Multivariate Statistics (0.50)~~
- ~~GEOG318 - Spatial Analysis (0.50)~~
- ~~PLAN351 - Multivariate Statistics (0.50)~~
- ~~PLAN353 - Spatial Analysis (0.50)~~
- ~~Grand Total Units: 5.5~~

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG415 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# GEM-Economy & Society Specialization - Economy and Development Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**

Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the Aviation, CEC and Geomatics programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the economy and society specialization, there was consensus that students could focus on either economy/development themes or well-being themes. Hence it was decided to split the specializations into two separate streams (one for economy and development and a separate, new specialization for well-being).

Additional constraints edited since thesis completion no longer counts towards a specialization.

Addition of note to provide a recommendation to students to take GEOG202, although not required.

Related agenda proposals:

- CEC-Economy & Society Specialization
- G-Economy & Society Specialization
- GA-Economy & Society Specialization

**Consultations (Departmental)**

Planning and SERS notified of cross-listed courses included in specialization.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**

Faculty of Environment

**Undergraduate Credential Type**

Specialization

Proposed

**Program/Plan Name**

Economy and Development Specialization

Existing

**Program/Plan Name**

Economy and Society Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geography & Environmental Management, or JH-Geography & Environmental Management

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a minimum of 2.5 units.
  - 1.0 unit must be at the 400-level.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
    - **2.5 - 3.5Units to Complete**
    - 
    - **Complete 5 of the following:**
    - **ENVS220 - Ecological Economics (0.50)**
    - **ENVS401 - Canadian Law, Indigenous Peoples, and Natural Resource Development (0.50)**
    - **ERS456 - Transforming Canadian Resource Management (1.00)**
    - GEOG203 - Environment and Development in a Global Perspective (0.50)
    - GEOG311 - Economic Geography and Society (0.50)
    - **GEOG319 - Economic Analyses for Regional Planning (0.50)**
    - GEOG323 - Tourism Impacts - International Perspectives (0.50)
    - GEOG356 - Resources Management (0.50)
    - **GEOG368 - Ecology and Conservation for Planning (0.50)**
    - GEOG411 - The Digital Economy (0.50)
    - GEOG423 - Sustainable Tourism (0.50)
    - GEOG426 - Geographies of Development (0.50)
    - **GEOG456 - Transforming Canadian Resource Management (1.00)**
    - REC383 - Tourism Impacts - International Perspectives (0.50)
    - **PLAN320 - Economic Analyses for Regional Planning (0.50)**
    - **PLAN341 - Ecology and Conservation for Planning (0.50)**
    - 
    - **Grand Total Units: 2.5 - 3.5**
    - ~~5.5Units to Complete~~
    - ~~Complete all of the following~~
    - ~~Complete all the following:~~
    - ~~GEOG202 - Geography of the Global Economy (0.50)~~
    - ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
    - ~~GEOG415 - Economy and Society Project (1.00)~~
    - ~~Complete 4 of the following:~~
    - ~~ERS361 - Food Systems and Sustainability (0.50)~~
    - ~~GEOG219 - How Pandemics Change the World (0.50)~~
    - ~~GEOG222 - Geographical Study of Canada (0.50)~~
    - ~~GEOG225 - Global Environment and Health (0.50)~~
    - ~~GEOG233 - Geography of Tourism (0.50)~~
    - ~~GEOG302 - Geographies of Work and Employment (0.50)~~
    - ~~GEOG325 - Geographies of Health (0.50)~~
    - ~~GEOG336 - Space, Power, and Politics: Citizenship in a Changing World (0.50)~~
    - ~~GEOG349 - Urban Form and Spatial Structure (0.50)~~
    - ~~GEOG361 - Food Systems and Sustainability (0.50)~~
    - ~~GEOG436 - Feminist Economic Geography: Gender, Identities and Social Change (0.50)~~
    - ~~PLAN349 - Urban Form and Spatial Structure (0.50)~~
    - ~~Complete 2 of the following:~~
    - ~~GEOG306 - Human Dimensions of Natural Hazards (0.50)~~
    - ~~GEOG307 - Societal Adaptation to Climate Change (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~Grand Total Units: 5.5~~

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the GEOG415 required course by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# H-Geography & Environmental Management - Geography and Environmental Management (Bachelor of Environmental Studies - Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar. No course substitutions necessary, since there are no changes to 100-level requirements. All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Yes,

**Co-operative Education Consultation**

Consultation with CEE and students groups has been conducted. A feasibility study was conducted and CEE is in support of the proposed coop sequencing changes.

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

Currently, our students have many 200-level degree requirements which are centered around obtaining foundational knowledge in the core areas of expertise in our department: human geography, physical geography, geospatial data science, and climate change. Currently, our plan requires students to complete 6 out of 7 foundational courses in these areas. We have reduced some of our 200-level foundational courses, and are now asking students to complete one course from each pillar (four courses total) rather than six. We are also shifting research methods requirements to the 300-level.

We also propose to add a foundational field ecology course as part of an expanded common core within our faculty, and to give our students field/lab experience at the 200-level.

Created new course codes for geospatial data science courses (GDS - still to be added), so have added into MAV calculations. De-listed AVIA/GEOG cross-lists, so have also added AVIA course codes into MAV calculations.

We have added new specializations available for this program (seven in total).

As GEM has reduced the specialization requirements from 5.5 to 2.5 units, students can now fit in two specializations within their degree requirements (i.e., they are required to take a certain number of GEOG/ENVS/GDS/AVIA elective courses and can fit in up to two specializations within these requirements). Further, we have removed course overlap between the specializations (and refined the focus) so that specialization titles better reflect student skillsets. Since students may develop more than one skillset within their course requirements, allowing them to reflect this as a credential is important for future career prospects.

Economy and Society specialization is being renamed to Economy and Development - this will be updated upon SUC approval.

GEOG181, GEOG271, and GEOG281 course subject will change to GDS, once approved by SUC.

Related proposals:

- Degree: ENVS
- Remote Sensing Specialization
- Environment, Society and Wellbeing Specialization
- GEOG207
- SCI205
- GEOG390

**Consultations (Departmental)**

Consultations have occurred within the department on all foundational areas of knowledge (including via a dept retreat and several departmental meetings). Sub-committees within the department were developed to guide this curriculum review.

**Supporting Documentation**

- Considerations for COOP sequence change in GEM, GEOMATICS, CEC Fall 2024.pdf

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**

Faculty of Environment

**Undergraduate Credential Type**

Major

**Program Type**

Honours

**Degree**

Bachelor of Environmental Studies

**Program/Plan Name**

Geography and Environmental Management (Bachelor of Environmental Studies - Honours)

**Systems of Study**
Co-operative, Regular,

## Admissions

**Admissions Entry Point**
Direct Entry,

## Requirements Information

**Invalid Combinations**
Yes,

**List of Invalid Combinations**

Geomatics (Joint Honours)

**Average Requirement**
Yes,

Proposed

**Minimum Average(s) Required**

- A minimum cumulative overall average of 65.0%.
- A minimum cumulative major average of 70.0% in all AVIA, ENVS, GDS, and GEOG courses.

Existing

**Minimum Average(s) Required**

- A minimum cumulative overall average of

65.0%.
- A minimum cumulative major average of 70.0% in all ENVS and GEOG courses.

Proposed

**Graduation Requirements**

- See Bachelor of Environmental Studies degree-level requirements.
- Complete a total of 20.0 units:
  - Complete 6.5 units of required courses.
  - Complete 5.0 units of additional AVIA, ENVS, GDS, or GEOG courses:
    - 0.5 unit must be at the 200-level or above.
    - 2.0 unit must be at the 300-level or above.
    - 2.5 units must be at the 400-level.
  - Complete 8.5 units of elective courses.

Existing

**Graduation Requirements**

- See Bachelor of Environmental Studies degree-level requirements.
- Complete a total of 20.0 units:
  - Complete 7.5 units of required courses.
  - Complete 4.5 units of additional ENVS or GEOG courses:
    - 1.0 unit must be at the 200-level or above.
    - 1.0 unit must be at the 300-level or above.
    - 2.5 units must be at the 400-level.
  - Complete 8.0 units of elective courses.

**Co-operative Education Program Requirements**

For students in the co-operative system of study, see Bachelor of Environmental Studies co-operative education program requirements.

1. Required Courses
   - **6Units to Complete**
   -
   - Complete all of the following
   - Complete all the following:
   - ENVS131 - Communications for Environmental Professions (0.50)
   - ENVS178 - Environmental Applications of Data Management and Statistics (0.50)
   - ENVS195 - Introduction to Environmental Studies (0.50)
   - **ENVS200 - Field Ecology (0.50)**
   - ENVS278 - Applied Statistics for Environmental Research (0.50)
   - GEOG100 - On Becoming a Geographer (0.50)
   - GEOG102 - Global Environmental Systems: Processes and Change (0.50)
   - GEOG181 - Designing Effective Maps (0.50)
   - **Course Not Found**

- 
- Complete 1 of the following:
- GEOG207 - Climate Change Fundamentals (0.50)
- **Course Not Found**
- 
- Complete 1 of the following:
- GEOG205 - Principles of Geomorphology (0.50)
- GEOG209 - Hydroclimatology (0.50)
- 
- Complete 1 of the following:
- GEOG202 - Geography of the Global Economy (0.50)
- **GEOG225 - Global Environment and Health (0.50)**
- 
- Complete 1 of the following:
- GEOG271 - Earth from Space Using Remote Sensing (0.50)
- GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
- PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
- 
- **Grand Total Units: 6**
- ~~7.5Units to Complete~~
- ~~Complete 6 of the following:~~
- ~~GEOG203 - Environment and Development in a Global Perspective (0.50)~~
- ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
- ~~GEOG294 - Approaches to Research in Physical Geography (0.50)~~
- ~~GEOG391 - Field Research (0.50)~~
- ~~GEOG392 - International Field Research (0.50)~~
- ~~Grand Total Units: 7.5~~

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. If a minimum grade of 60.0% is achieved in ENVS131, the Undergraduate Communication Requirement (UCR) milestone will be granted. If the minimum grade is not met, see Bachelor of Environmental Studies degree-level requirements and contact the Geography and Environmental Management academic advisor.

3. Up to three independent study GEOG475 courses may be taken.

Proposed

**Notes**

- GEOG202 provides a strong foundation for the Economy & Society Specialization, wherein GEOG225 provides a strong foundation for the Environment, Society, & Well-Being Specialization. Students interested in either or both these specializations are encouraged to complete the respective foundational course(s).
- See list of academic advisors.
- See Geography and Environmental Management website for recommended course sequences.
- For an overview of the academic and career objectives see the Department of Geography and Environmental Management website.

Existing

**Notes**

- See list of academic advisors.
- See Geography and Environmental Management website for recommended course sequences.
- For an overview of the academic and career objectives see the Department of Geography and Environmental Management website.

## Specializations

**Specializations for this Major**
Yes - Optional,

Proposed

**Specialization Details**

Students may choose to focus their elective choices by completing two of seven available specializations.

Existing

**Specialization Details**

Students may choose to focus their elective choices by completing one of five available specializations.

1. GEM-Aviation Specialization, GEM-Climate Change & Environment Specialization, GEM-Earth Systems Science Specialization, GEM-Economy & Society Specialization,
    - **Not Found**
    - **, GEM-Geomatics Specialization, or**
    - **Not Found**

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# JH-Geography & Environmental Management - Geography and Environmental Management (Joint Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**

**Academic Unit Approval**

Change, 2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar. No course substitutions will be required, since there are no changes to first-year requirements. All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
No,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

Currently, our students have many 200-level degree requirements which are centered around obtaining foundational knowledge in the core areas of expertise in our department: human geography, physical geography, geospatial data science, and climate change. Currently, our plan requires students to complete 6 out of 7 foundational courses in these areas. We have reduced some of our 200-level foundational courses, and are now asking students to complete one course from each pillar (four courses total) rather than six. We are also shifting research methods requirements to the 300-level, retiring GEOG 293 and GEOG 294, and

creating a new mandatory GEOG 390 course focused on research methods.

We also propose to add a foundational field ecology course (ENVS 200) as part of an expanded common core within our faculty, and to give our students field/lab experience at the 200-level.

Adjusted required GEOG elective course units, in order to add up to 8.0 units, and to reflect reduced 200-level course load to make space for additional 300 and 400-level GEOG/ENVS/GDS/AVIA electives.

Created new course codes for geospatial data science courses, so have added into MAV calculations. De-listed AVIA/GEOG cross-lists, so have also added AVIA course codes into MAV calculations.

As GEM has reduced the specialization requirements from 5.5 to 2.5 units, students can now fit in two specializations within their degree requirements (i.e., they are required to take a certain number of GEOG/ENVS/GDS/AVIA elective courses and can fit in up to two specializations within these requirements). Further, we have removed course overlap between the specializations (and refined the focus) so that specialization titles better reflect student skillsets. Since students may develop more than one skillset within their course requirements, allowing them to reflect this as a credential is important for future career prospects.

Economy and Society specialization is being renamed to Economy and Development - this will be updated upon SUC approval.

GEOG181, GEOG271, and GEOG181, course subject will be updated to GDS, upon SUC approval.

Related proposals:

- GEM-Remote Sensing
- GEM-Environment, Society and Well-being

**Consultations (Departmental)**

No consultations necessary.

## General Program/Plan Information

**Faculty** **Academic Unit**

Faculty of Environment

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Major

**Program Type**
Joint Honours

**Program/Plan Name**
Geography and Environmental Management (Joint Honours)

## Admissions

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- Before declaring this academic plan, see invalid credential combinations.

## Requirements Information

**Invalid Combinations**
Yes,

**List of Invalid Combinations**

Climate and Environmental Change (Bachelor of Sciences - Honours)

Geography and Aviation (Bachelor of Environmental Studies - Honours)

Geomatics (Bachelor of Environmental Studies - Honours)

**Average Requirement**
Yes,

Proposed

**Minimum Average(s) Required**

- A minimum cumulative major average of 70.0% in all AVIA, ENVS, GDS, and GEOG courses.
- Must satisfy the major average requirement for the first major.

Existing

**Minimum Average(s) Required**

- A minimum cumulative major average of 70.0% in all ENVS and GEOG courses.
- Must satisfy the major average requirement for the first major.

**Graduation Requirements**

- Complete a total of 8.5 units.

**Course Requirements (units)**

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - 
    - Complete all of the following
    - Complete all the following:
    - ENVS195 - Introduction to Environmental Studies (0.50)
    - ENVS178 - Environmental Applications of Data Management and Statistics (0.50)
    - **ENVS200 - Field Ecology (0.50)**
    - ENVS278 - Applied Statistics for Environmental Research (0.50)
    - GEOG102 - Global Environmental Systems: Processes and Change (0.50)
    - GEOG181 - Designing Effective Maps (0.50)
    - **Course Not Found**
    - 
    - Complete 1 of the following:
    - GEOG207 - Climate Change Fundamentals (0.50)
    - **Course Not Found**
    - 
    - Complete 1 of the following:
    - GEOG202 - Geography of the Global Economy (0.50)
    - **GEOG225 - Global Environment and Health (0.50)**
    - 
    - Complete 1 of the following:
    - GEOG205 - Principles of Geomorphology (0.50)
    - GEOG209 - Hydroclimatology (0.50)
    - 
    - Complete 1 of the following:
    - GEOG271 - Earth from Space Using Remote Sensing (0.50)
    - GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - 
    - **Complete 3.0 additional units of AVIA, ENVS, GDS, or GEOG courses at the 300-level or higher, of which a minimum of 1.5 units must be at the 400-level**
    - ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
    - ~~GEOG294 - Approaches to Research in Physical Geography (0.50)~~
    - ~~GEOG391 - Field Research (0.50)~~
    - ~~GEOG392 - International Field Research (0.50)~~
    - ~~Complete 6 of the following:~~
    - ~~GEOG203 - Environment and Development in a Global Perspective (0.50)~~
    - ~~Complete 0.5 unit of ENVS or GEOG courses at the 300-level~~
    - ~~Complete 1.5 units of ENVS or GEOG courses at the 400-level~~

**Course Lists**

Required Courses

- No Rules

| **Are there cross-listed courses listed in requirements?** | **Cross-Listings Options** |
|---|---|

Yes, All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. Courses in the home department equivalent to ENVS178; ENVS278; GEOG490A and GEOG490B must be approved by the Associate Chair, Undergraduate Studies, Geography and Environmental Management to count towards plan requirements.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. Courses in the home department equivalent to ENVS178; ENVS278; GEOG293 or GEOG294; GEOG490A and GEOG490B must be approved by the Associate Chair, Undergraduate Studies, Geography and Environmental Management to count towards plan requirements.

Proposed

**Notes**

- GEOG202 provides a strong foundation for the Economy & Society Specialization, wherein GEOG225 provides a strong foundation for the Environment, Society, & Well-Being Specialization. Students interested in either or both these specializations are encouraged to complete the respective foundational course(s).
- See list of academic advisors.

Existing

**Notes**

- See list of academic advisors.

## Specializations

**Specializations for this Major**
Yes - Optional,

Proposed

**Specialization Details**

Students may choose to focus their elective choices by completing two of seven available specializations.

Existing

**Specialization Details**

Students may choose to focus their elective choices by completing one of five available specializations.

1. GEM-Aviation Specialization, GEM-Climate Change & Environment Specialization, GEM-Earth Systems Science Specialization, GEM-Economy & Society Specialization,
    - **Not Found**
    - **, GEM-Geomatics Specialization, or**
    - **Not Found**

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# 3G-Geography & Environmental Management - Geography and Environmental Management (Bachelor of Environmental Studies - Three-Year General)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
No,

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

We have made some adjustments to our 200-level foundations courses and associated requirements for students. Students are now required to take one course from each of our foundational pillars (climate change, human geography, physical geography, and geospatial data science) rather than 6/7 courses.

We also propose to add a foundational field ecology course as part of an expanded common core within our faculty, and to give our students field/lab experience at the 200-level.

Created new course codes for geospatial data science courses, so have added into MAV calculations. De-listed AVIA/GEOG cross-lists, so have also added AVIA course codes into MAV calculations.

GEOG181, GEOG271, and GEOG281 course subject will change to GDS, once approved by SUC.

Related agenda proposals: N/A

**Consultations (Departmental)**

No consultations necessary.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**

Faculty of Environment

**Undergraduate Credential Type**

Major

**Program Type**

Three Year General

**Degree**

Bachelor of Environmental Studies

**Program/Plan Name**
Geography and Environmental Management (Bachelor of Environmental Studies - Three-Year General)

**Systems of Study**
Regular,

## Admissions

**Admissions Entry Point**
Declare Plan,

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
Yes,

Proposed

**Minimum Average(s) Required**

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 65.0% in all AVIA, ENVS, GDS, and GEOG courses.

Existing

**Minimum Average(s) Required**

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 65.0% in all ENVS and GEOG courses.

Proposed

**Graduation Requirements**

- See Bachelor of Environmental Studies degree-level requirements.
- Complete a total of 15.0 units:
  - Complete 5.0 units of required courses.
  - Complete 0.5 unit of AVIA, ENVS, GDS, or GEOG courses.
  - Complete 2.0 units of additional AVIA, ENVS, GDS, or GEOG courses:
    - 0.5 unit must be at the 200-level or above.
    - 1.5 unit must be at the 300-level or above.
  - Complete 7.5 units of elective courses.

Existing

**Graduation Requirements**

- See Bachelor of Environmental Studies degree-level requirements.
- Complete a total of 15.0 units:
  - Complete 5.5 units of required courses.
  - Complete 0.5 unit of ENVS or GEOG courses.
  - Complete 1.5 units of additional ENVS or GEOG courses:
    - 0.5 unit must be at the 200-level or above.
    - 1.0 unit must be at the 300-level or above.
  - Complete 7.5 units of elective courses.

1. Required Courses
   - **5Units to Complete**
   -

- Complete all of the following
- Complete all the following:
- ENVS131 - Communications for Environmental Professions (0.50)
- ENVS178 - Environmental Applications of Data Management and Statistics (0.50)
- ENVS195 - Introduction to Environmental Studies (0.50)
- GEOG102 - Global Environmental Systems: Processes and Change (0.50)
- GEOG181 - Designing Effective Maps (0.50)
- **ENVS200 - Field Ecology (0.50)**
- 
- **Complete 1 of the following:**
- GEOG207 - Climate Change Fundamentals (0.50)
- **Course Not Found**
- 
- **Complete 1 of the following:**
- GEOG205 - Principles of Geomorphology (0.50)
- GEOG209 - Hydroclimatology (0.50)
- 
- **Complete 1 of the following:**
- GEOG202 - Geography of the Global Economy (0.50)
- **GEOG225 - Global Environment and Health (0.50)**
- 
- **Complete 1 of the following:**
- GEOG271 - Earth from Space Using Remote Sensing (0.50)
- GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
- PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
- 
- **Grand Total Units: 5**
- ~~5.5Units to Complete~~
- ~~Complete 6 of the following:~~
- ~~GEOG203 - Environment and Development in a Global Perspective (0.50)~~
- ~~Grand Total Units: 5.5~~

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. If a minimum grade of 60.0% is achieved in ENVS131, the Undergraduate Communication Requirement (UCR) milestone will be granted. If the minimum grade is not met, see Bachelor of Environmental Studies degree-level requirements and contact the Geography and Environmental Management academic advisor.

**Notes**

- See list of academic advisors.
- For an overview of the academic and career objectives see the Department of Geography and Environmental Management website.

## Specializations

**Specializations for this Major**

Yes - Optional,

**Specialization Details**

Students may choose to focus their elective choices by completing the available specialization.

**Specializations List**

GEM-Aviation Specialization

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment

## Dependencies

# Geography & Environmental Management Minor - Geography and Environmental Management Minor

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2023

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Some current students, who have already declared the minor, will be allowed to take courses with GDS or AVIA course codes. The requirement term will be changed for this students accordingly.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, our department has decided to create a new course code for courses focused on Geomatics/Geospatial Data Science (new course code = GDS). Minor requirements need to be changed to reflect that students taking GDS courses can count this towards their minor requirements.

We are also delisting many of the GEOG/AVIA cross-listed courses so that they will just have an AVIA course code. To accommodate this change, we are adding AVIA course codes as an option to count towards the GEM minor requirements as well.

Additional constraint added, restricting the use of AVIA professional pilot and ground instruction courses from being used towards this minor. AVIA professional pilot and ground instruction courses are graded CR, and such would not contribute to the minor average. Also, allowing these courses to count would allow Science and Aviation students to qualify for this minor without completing any additional courses.

Note: under course requirements, complete all of the following, will be removed upon approval.

**Consultations (Departmental)**

No consultations necessary.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**

Faculty of Environment

**Undergraduate Credential Type**
Minor

**Program/Plan Name**
Geography and Environmental Management Minor

## Admissions

**Admissions Entry Point**
Declare Plan,

**Declaration Audience**
This credential is open to students enrolled in any degree program.

**Declaration Requirements**

- Before requesting admission to this academic plan, see invalid credential combinations.

## Requirements Information

**Invalid Combinations**
Yes,

**List of Invalid Combinations**

Climate and Environmental Change (Bachelor of Sciences - Honours)

Geography and Aviation (Bachelor of Environmental Studies - Honours)

Geomatics (Bachelor of Environmental Studies - Honours)

Geomatics (Joint Honours)

**Average Requirement**
Yes,

**Minimum Average(s) Required**

- A minimum cumulative minor average of 65.0%.

Proposed

**Graduation Requirements**

- Complete a total of 5.0 units in AVIA, ENVS, GDS, and GEOG courses.
  - Students may use no more than 2.0 units of ENVS courses.

Existing

**Graduation Requirements**

- Complete a total of 5.0 units in GEOG and ENVS courses.
  - Students may use no more than 2.0 units of ENVS courses.

1. Required Courses
   - 0Units to Complete
   -
   - No Rules

**Course Requirements (no units)**

Required Courses

- No Rules

1. Required Courses
    - 
    - **The following cannot be used towards this academic plan:**
    - **AVIA101 - Professional Pilot Program Course 1 (0.75)**
    - **AVIA102 - Professional Pilot Program Course 2 (0.50)**
    - **AVIA121 - Professional Pilot Program Course 1 (0.50)**
    - **AVIA141 - Preparatory Ground Instruction 1 (0.25)**
    - **AVIA142 - Preparatory Ground Instruction 2 (0.25)**
    - **AVIA203 - Professional Pilot Program Course 3 (0.50)**
    - **AVIA204 - Professional Pilot Program Course 4 (0.75)**
    - **AVIA205 - Professional Pilot Program Course 5 (0.50)**
    - **AVIA222 - Professional Pilot Program Course 2 (0.50)**
    - **AVIA223 - Professional Pilot Program Course 3 (0.50)**
    - **AVIA243 - Preparatory Ground Instruction 3 (0.25)**
    - **AVIA244 - Preparatory Ground Instruction 4 (0.25)**
    - **AVIA245 - Preparatory Ground Instruction 5 (0.25)**
    - **AVIA306 - Professional Pilot Program Course 6 (0.75)**
    - **AVIA307 - Professional Pilot Program Course 7 (0.75)**
    - **AVIA324 - Professional Pilot Program Course 4 (0.50)**
    - **AVIA325 - Professional Pilot Program Course 5 (0.50)**
    - **AVIA346 - Preparatory Ground Instruction 6 (0.25)**
    - **AVIA347 - Preparatory Ground Instruction 7 (0.25)**
    - **AVIA408 - Professional Pilot Program Course 8 (0.50)**
    - **AVIA426 - Professional Pilot Program Course 6 (0.75)**
    - ~~No Rules~~

**Are there cross-listed courses listed in requirements?**

No,

**Notes**

- See list of academic advisors.

## Specializations

## Undergraduate Plan Guidelines

**Adherence to Academic Plan Guidelines**
Yes,

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment

## Dependencies

# H-Geomatics - Geospatial Data Science (Bachelor of Environmental Studies - Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar. No course substitutions will be required, since there are no changes to first-year requirements. All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

**Is the credential name changing?**

Yes,

**Impact of Credential Name Change**

The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**

Yes,

**Co-operative Education Consultation**

Consultation with CEE and students groups has been conducted. A feasibility study was conducted and CEE is in support of the proposed coop sequencing changes.

**Creating or Changing Invalid Combinations**

Yes,

**Invalid Combinations Consultations**

With new Certificate in GIS

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, we are proposing to change the name of the Geomatics program to 'Geospatial Data Science', with the creation of corresponding course codes (GDS) to support this name and reflect the nature of the GDS courses.

Admissions in the Registrar's Office was consulted, regarding the incoming class of Fall 2026, and the proposed name change as it will differ from the plan which they applied to through OUAC.

Admissions is aware of this change, noting that a robust communication plan will be required to inform the incoming class.

The term Geomatics has a professional identity that is very strongly tied to surveying and traditionally, therefore, to civil engineering. When the Geomatics program was launched at the University of Waterloo, much of the surveying tradition was to be found in civil and environmental engineering department. However, while limited expertise in Geography connected with surveying, historically, since 2005, the dominant identity of the Geomatics plan has reflected the strong and deep expertise of geographical information systems, remote sensing and spatial analysis, with less emphasis on surveying. Over time, the applied GIS and remote sensing technologies have strengthened, and while surveying remains a part of the plan, the dominant interest amongst students and faculty within the Geomatics plan is in the geospatial data science aspects (GIS, remote sensing and geospatial analysis). These are the dominant elements for which our program and graduates are known for, and creates the core of our disciplinary identity.

High school students are aware of data science as a recognizable and viable career path especially with a dominance in AI applications. At Waterloo, the re-branding of geomatics to geospatial data science, which corresponding course codes, better reflects what is actually taught in our program, and is a description that will better connect with potential students from a recruitment perspective. Geospatial data science explicitly deals with the acquisition and analysis of geospatial data and its adoption for environmental, policy and planning applications. For several years now, our introductory course for Geomatics students has been named 'Geospatial Data Science', as an attempt to better communicate to our entering class, the specifics of the plan they are embarking on. Changing the degree name, therefore, to Geospatial Data Science will:

- Better reflect the nature of our teaching and learning expertise in GEM (GIS, remote sensing, geospatial analysis, environmental and policy applications)
- Better resonate with high school students who are interested in the environment applications of geospatial data science
- Better serve students by incorporating professor's research applications into lesson planning. (modified)
- Better prepare students for the co-op positions, so potential employers have a clear sense of the training the student has received.
- Enable us to better leverage our research applications into teaching
- Maintain a strong link which students can leverage through co-op and at post-graduation

As part of this curriculum review, revisions to degree requirements and new courses were created to better align with technological advancements in the field (e.g., adding a new course focused on AI in geospatial data science). Course focused solely on surveying (GEOG 310) is being retired.

Created new course codes for geospatial data science courses (GDS - still to be added), so have added into MAV calculations. De-listed AVIA/GEOG cross-lists, so have also added AVIA course codes into MAV calculations.

The new Certificate in GIS is being added as an invalid combination due to overlapping courses and content.

Combination with the Diploma of Excellence in GIS is allowed, due to the average requirement for the diploma (80%).

As GEM has reduced the specialization requirements from 5.5 to 2.5 units, students can now fit in two specializations within their degree requirements (i.e., they are required to take a certain number of GEOG/ENVS/GDS/AVIA elective courses and can fit in up to two specializations within these requirements). Further, we have removed course overlap between the specializations (and refined the focus) so that specialization titles better reflect student skillsets. Since students may develop more than one skillset within their course requirements, allowing them to reflect this as a credential is important for future career prospects.

Economy and Society specialization is being renamed to Economy and Development - this will be updated upon SUC approval.

GEOG181, GEOG187, GEOG270, GEOG271, GEOG281, GEOG371, GEOG381, GEOG387, GEOG471, and GEOG481, subject with change to GDS, once approved by SUC.

Related proposals:

- Certificate in GIS
- Environment, Society and Wellbeing Specialization
- Degree: ENVS
- GEOG287
- GEOG390

- PLAN387

**Consultations (Departmental)**

Consultations with Admissions in the Registrar's Office.

Consultations have occurred within the department on all foundational areas of knowledge (including via a dept retreat and several departmental meetings). Sub-committees within the department were developed to guide this curriculum review.

Consultations have occurred with Planning regarding cross-listed courses.

Consultations with Math and Science on the program name change have also occurred (still in progress).

2025-10-08: Math ADUG Benoit Charbonneau expressed support for program name change on behalf of Faculty of Mathematics.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Major

**Program Type**
Honours

**Degree**
Bachelor of Environmental Studies

Proposed

**Program/Plan Name**
Geospatial Data Science (Bachelor of Environmental Studies - Honours)

Existing

**Program/Plan Name**
Geomatics (Bachelor of Environmental Studies - Honours)

**Systems of Study**
Co-operative, Regular,

## Admissions

**Admissions Entry Point**
Direct Entry,

## Requirements Information

**Invalid Combinations**
Yes,

Proposed

**List of Invalid Combinations**

Certificate in Geographic Information Systems

Geography and Environmental Management (Joint Honours)

Geography and Environmental Management Minor

Existing

**List of Invalid Combinations**

Geography and Environmental Management Minor

Geography and Environmental Management (Joint Honours)

**Average Requirement**
Yes,

Proposed

**Minimum Average(s) Required**

- A minimum cumulative overall average of 65.0%.
- A minimum cumulative special major average of 60.0% in all CS and MATH courses.
- A minimum cumulative major average of 70.0% in all AVIA, ENVS, GDS, and GEOG courses.

Existing

**Minimum Average(s) Required**

- A minimum cumulative overall average of 65.0%.
- A minimum cumulative special major average of 60.0% in all CS and MATH courses.
- A minimum cumulative major average of 70.0% in all ENVS and GEOG courses.

**Graduation Requirements**

- See Bachelor of Environmental Studies degree-level requirements.
- Complete a total of 20.0 units.

**Co-operative Education Program Requirements**

For students in the co-operative system of study, see Bachelor of Environmental Studies co-operative education program requirements.

**Course Requirements (units)**

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - 
    - Complete all of the following
    - Complete all the following:
    - CS234 - Data Types and Structures (0.50)
    - CS338 - Computer Applications in Business: Databases (0.50)
    - ENVS131 - Communications for Environmental Professions (0.50)
    - ENVS178 - Environmental Applications of Data Management and Statistics (0.50)
    - ENVS195 - Introduction to Environmental Studies (0.50)
    - **ENVS200 - Field Ecology (0.50)**
    - ENVS278 - Applied Statistics for Environmental Research (0.50)
    - **Course Not Found**
    - GEOG102 - Global Environmental Systems: Processes and Change (0.50)
    - GEOG181 - Designing Effective Maps (0.50)
    - GEOG187 - Geospatial Data Science (0.50)
    - GEOG207 - Climate Change Fundamentals (0.50)
    - GEOG271 - Earth from Space Using Remote Sensing (0.50)
    - GEOG371 - Advanced Remote Sensing Techniques (0.50)
    - GEOG387 - Spatial Databases (0.50)
    - **Course Not Found**
    - GEOG471 - Remote Sensing Project (1.00)
    - 
    - Complete 1 of the following:
    - CS115 - Introduction to Computer Science 1 (0.50)
    - CS135 - Designing Functional Programs (0.50)
    - 
    - Complete 1 of the following:
    - CS116 - Introduction to Computer Science 2 (0.50)
    - CS136 - Elementary Algorithm Design and Data Abstraction (0.50)
    - 
    - Complete 1 of the following:
    - GEOG202 - Geography of the Global Economy (0.50)
    - **GEOG225 - Global Environment and Health (0.50)**
    - 
    - Complete 1 of the following:
    - GEOG205 - Principles of Geomorphology (0.50)
    - GEOG209 - Hydroclimatology (0.50)
    - 
    - Complete 1 of the following:
    - GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - 
    - Complete 1 of the following:
    - GEOG318 - Spatial Analysis (0.50)
    - PLAN353 - Spatial Analysis (0.50)

- 
- Complete 1 of the following:
- GEOG381 - Advanced Geographic Information Systems (0.50)
- PLAN381 - Advanced Geographic Information Systems (0.50)
- 
- Complete 1 of the following:
- 
- Complete 1 of the following:
- GEOG481 - Geographic Information Systems Project (1.00)
- PLAN481 - Geographic Information Systems Project (1.00)
- 
- Complete 1 of the following:
- MATH106 - Applied Linear Algebra 1 (0.50)
- MATH114 - Linear Algebra for Science (0.50)
- 
- Complete 1 of the following:
- **AVIA270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)**
- **GEOG270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)**
- 
- Complete 1 of the following
- Complete all of the following
- Complete all the following:
- GEOG490A - Honours Thesis Preparation (0.50)
- GEOG490B - Honours Thesis Completion (1.00)
- 
- **Complete 4.0 units of elective courses.**
- 
- **Complete 5.5 units of elective courses.**
- ~~GEOG310 - Geodesy and Surveying (0.50)~~
- ~~GEOG203 - Environment and Development in a Global Perspective (0.50)~~
- ~~GEOG293 - Approaches to Research in Human Geography (0.50)~~
- ~~GEOG294 - Approaches to Research in Physical Geography (0.50)~~
- ~~GEOG316 - Multivariate Statistics (0.50)~~
- ~~PLAN351 - Multivariate Statistics (0.50)~~
- ~~PLAN387 - Spatial Databases (0.50)~~
- ~~Complete 5.0 units of elective courses.~~
- ~~Complete 6.5 units of elective courses.~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

2. If a minimum grade of 60.0% is achieved in ENVS131, the Undergraduate Communication Requirement (UCR) milestone will be granted. If the minimum grade is not met, see Bachelor of Environmental Studies degree-level requirements and contact the Geomatics academic advisor.
3. Students who opt to take CS136 are required to take CS136L (0.25 unit) as they are listed corequisites. CS136L is graded as CR or NCR (Credit or No Credit). A CR grade in CS136L will be used towards the total unit requirement, but it is not required for this plan.

Proposed

**Notes**

- GEOG202 provides a strong foundation for the Economy & Society Specialization, wherein GEOG225 provides a strong foundation for the Environment, Society, & Well-Being Specialization. Students interested in either or both these specializations are encouraged to complete the respective foundational course(s).
- See list of academic advisors.
- See Geomatics website for recommended course sequences.
- For an overview of the academic and career objectives see the Department of Geography and Environmental Management website.

Existing

**Notes**

- See list of academic advisors.
- See Geomatics website for recommended course sequences.

- For an overview of the academic and career objectives see the Department of Geography and Environmental Management website.

## Specializations

**Specializations for this Major**
Yes - Optional,

Proposed

**Specialization Details**

Students may choose to focus their elective choices by completing two of five available specializations.

Existing

**Specialization Details**

Students may choose to focus their elective choices by completing one of four available specializations.

1. G-Aviation Specialization, G-Climate Change & Environment Specialization, G-Earth Systems Science Specialization, G-Economy & Society Specialization, or
    - **Not Found**

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment

## Dependencies

# JH-Geomatics - Geospatial Data Science (Joint Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2023

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar. No course substitutions will be required, since there are no changes to first-year requirements. All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

**Is the credential name changing?**

Yes,

**Impact of Credential Name Change**

The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**

No,

**Creating or Changing Invalid Combinations**

Yes,

**Invalid Combinations Consultations**

Adding the new Certificate in GIS

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, we are proposing to change the name of the Geomatics program to 'Geospatial Data Science', with the creation of corresponding course codes (GDS) to support this name and reflect the nature of the GDS courses.

Since this is not a direct entry academic plan, consultations with admissions was not required.

The term Geomatics has a professional identity that is very strongly tied to surveying and traditionally, therefore, to civil engineering. When the Geomatics program was launched at the University of Waterloo, much of the surveying tradition was to be found in civil and environmental engineering department. However, while limited expertise in Geography connected with surveying, historically, since 2005, the dominant identity of the Geomatics plan has reflected the strong and deep expertise of geographical information systems, remote sensing and spatial analysis, with less emphasis on surveying. Over time, the applied GIS and remote sensing technologies have strengthened, and while surveying remains a part of the plan, the dominant interest amongst students and faculty within the Geomatics plan is in the geospatial data science aspects (GIS, remote sensing and geospatial analysis). These are the dominant elements for which our program and graduates are known for, and creates the core of our disciplinary identity.

High school students are aware of data science as a recognizable and viable career path especially with a dominance in AI applications. At Waterloo, the re-branding of geomatics to geospatial data science, which

corresponding course codes, better reflects what is actually taught in our program, and is a description that will better connect with potential students from a recruitment perspective. Geospatial data science explicitly deals with the acquisition and analysis of geospatial data and its adoption for environmental, policy and planning applications. For several years now, our introductory course for Geomatics students has been named 'Geospatial Data Science', as an attempt to better communicate to our entering class, the specifics of the plan they are embarking on. Changing the degree name, therefore, to Geospatial Data Science will:

- Better reflect the nature of our teaching and learning expertise in GEM (GIS, remote sensing, geospatial analysis, environmental and policy applications)
- Better resonate with high school students who are interested in the environment applications of geospatial data science
- Better serve students by incorporating professor's research applications into lesson planning. (modified)
- Better prepare students for the co-op positions, so potential employers have a clear sense of the training the student has received.
- Enable us to better leverage our research applications into teaching
- Maintain a strong link which students can leverage through co-op and at post-graduation

As part of this curriculum review, revisions to degree requirements and new courses were created to better align with technological advancements in the field (e.g., adding a new course focused on AI in geospatial data science). Course focused solely on surveying (GEOG 310) is being retired.

Created new course codes for geospatial data science courses (GDS - still to be added), so have added into MAV calculations. De-listed AVIA/GEOG cross-lists, so have also added AVIA course codes into MAV calculations.

Economy and Society specialization is being renamed to Economy and Development - this will be updated upon SUC approval.

The new Certificate in GIS is being added as an invalid combination due to overlapping courses and content.

Combination with the Diploma of Excellence in GIS is allowed, due to the average requirement for the diploma (80%).

Related proposals:

- Certificate in GIS

**Note: GDS label is still under review. Motion will be pending the approval of this label for inclusion in the MAV. Courses that have been approved for this new label, will automatically be updated after SUC.**

**Consultations (Departmental)**

Consultations have occurred within the department on all foundational areas of knowledge (including via a dept retreat and several departmental meetings). Sub-committees within the department were developed to guide this curriculum review.

Consultations have occurred with Planning regarding cross-listed courses.

Consultations with Math and Science on the program name change have also occurred.

2025-10-08: Math ADUG Benoit Charbonneau expressed support for program name change on behalf of Faculty of Mathematics.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**

Faculty of Environment

**Undergraduate Credential Type**

Major

**Program Type**

Joint Honours

| Proposed |
| --- |
| **Program/Plan Name**<br>Geospatial Data Science (Joint Honours) |
| Existing |
| **Program/Plan Name**<br>Geomatics (Joint Honours) |

## Admissions

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- Before declaring this academic plan, see invalid credential combinations.

## Requirements Information

**Invalid Combinations**
Yes,

Proposed

**List of Invalid Combinations**

- Climate and Environmental Change (Bachelor of Sciences - Honours)
- Geography and Aviation (Bachelor of Environmental Studies - Honours)
- Geography and Environmental Management (Bachelor of Environmental Studies - Honours)
- Geography and Environmental Management Minor
- Certificate in Geographic Information Systems

Existing

**List of Invalid Combinations**

- Climate and Environmental Change (Bachelor of Sciences - Honours)

Geography and Aviation (Bachelor of Environmental Studies - Honours)

Geography and Environmental Management (Bachelor of Environmental Studies - Honours)

Geography and Environmental Management Minor

**Average Requirement**
Yes,

Proposed

**Minimum Average(s) Required**

- A minimum cumulative special major average of 60.0% in all CS and MATH courses.
- A minimum cumulative major average of 70.0% in all AVIA, ENVS, GDS, and GEOG courses.
- Must satisfy the major average requirement for the first major.

Existing

**Minimum Average(s) Required**

- A minimum cumulative special major average of 60.0% in all CS and MATH courses.
- A minimum cumulative major average of 70.0% in all ENVS and GEOG courses.
- Must satisfy the major average requirement for the first major.

**Graduation Requirements**

- Complete a total of 8.5 units.

**Course Requirements (units)**

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - 
    - Complete all of the following
    - Complete all the following:
    - CS234 - Data Types and Structures (0.50)
    - CS338 - Computer Applications in Business: Databases (0.50)
    - ENVS278 - Applied Statistics for Environmental Research (0.50)
    - GEOG271 - Earth from Space Using Remote Sensing (0.50)
    - **Course Not Found**
    - GEOG371 - Advanced Remote Sensing Techniques (0.50)
    - GEOG387 - Spatial Databases (0.50)
    - GEOG471 - Remote Sensing Project (1.00)
    - 
    - Complete 1 of the following:
    - CS115 - Introduction to Computer Science 1 (0.50)
    - CS135 - Designing Functional Programs (0.50)
    - 
    - Complete 1 of the following:
    - CS116 - Introduction to Computer Science 2 (0.50)
    - CS136 - Elementary Algorithm Design and Data Abstraction (0.50)
    - 
    - Complete 1 of the following:
    - GEOG181 - Designing Effective Maps (0.50)
    - GEOG187 - Geospatial Data Science (0.50)
    - 
    - Complete 1 of the following:
    - GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)
    - 
    - Complete 1 of the following:
    - GEOG381 - Advanced Geographic Information Systems (0.50)
    - PLAN381 - Advanced Geographic Information Systems (0.50)
    - 
    - Complete 1 of the following:
    - GEOG481 - Geographic Information Systems Project (1.00)
    - PLAN481 - Geographic Information Systems Project (1.00)
    - 
    - Complete 1 of the following:
    - MATH106 - Applied Linear Algebra 1 (0.50)
    - MATH114 - Linear Algebra for Science (0.50)
    - ~~GEOG310 - Geodesy and Surveying (0.50)~~
    - ~~PLAN387 - Spatial Databases (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**

Yes,

**Cross-Listings Options**

All cross-listings to be displayed,

**Additional Constraints**

1. Students who opt to take CS136 are required to take CS136L (0.25 unit) as they are listed corequisites. CS136L is graded as CR or NCR (Credit or No Credit). A CR grade in CS136L will be used towards the total unit requirement, but it is not required for this plan.

**Notes**

- See list of academic advisors.

## Specializations

**Specializations for this Major**

No,

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# CEC-Geomatics Specialization - Geographic Information Systems Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the Aviation and GEM programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the Geomatics specialization, there was consensus that students can focus on developing their skillset in either GIS or remote sensing, and so the specialization is being divided into two separate credentials (one for GIS and one for remote sensing). Previously, the specialization included both course streams.

Further this revision ensures student skillsets, as presented on their degree, will offer greater clarity. The term 'Geomatics' is often associated with surveying, so the change to reference 'GIS' is clearer.

Additional constraints about the thesis removed, since the thesis will no longer count towards the specialization.
Combination with the new Certificate in GIS is allowed.
GEOG381, GEOG387, and GEOG481, course subject will change to GDS, once approved by SUC.
Related agenda proposals:

- CEC-Remote Sensing Specialization
- GA-Remote Sensing Specialization
- GEM-Remote Sensing Specialization
- GA-Geomatics Specialization
- GEM-Geomatics Specialization
- PLAN387
- GEOG487
- PLAN487

**Consultations (Departmental)**

Consultations with Planning have occurred. Planning expressed support during a meeting held on Wed. Sept. 17, 2025.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

Proposed

**Program/Plan Name**
Geographic Information Systems Specialization

Existing

**Program/Plan Name**
Geomatics Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Climate & Environmental Change

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a total of 2.5 units.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
    - **2.5Units to Complete**
    -
    - **Complete all of the following**

- **Complete all the following:**
- **GEOG387 - Spatial Databases (0.50)**
-
- **Complete 1 of the following:**
- **GEOG318 - Spatial Analysis (0.50)**
- **PLAN353 - Spatial Analysis (0.50)**
-
- **Complete 1 of the following:**
- **GEOG381 - Advanced Geographic Information Systems (0.50)**
- **PLAN381 - Advanced Geographic Information Systems (0.50)**
-
- **Complete 1 of the following:**
- **GEOG481 - Geographic Information Systems Project (1.00)**
- **PLAN481 - Geographic Information Systems Project (1.00)**
-
- **Grand Total Units: 2.5**
- ~~0Units to Complete~~
- ~~No Rules~~

1. Required Courses
   -
   - **No Rules**
   - ~~Complete all of the following~~
   - ~~Complete all the following:~~
   - ~~GEOG271 - Earth from Space Using Remote Sensing (0.50)~~
   - ~~GEOG310 - Geodesy and Surveying (0.50)~~
   - ~~Complete 1 of the following:~~
   - ~~GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)~~
   - ~~PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)~~
   - ~~Complete 2 of the following:~~
   - ~~AVIA270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)~~
   - ~~GEOG270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)~~
   - ~~GEOG316 - Multivariate Statistics (0.50)~~
   - ~~GEOG318 - Spatial Analysis (0.50)~~
   - ~~GEOG325 - Geographies of Health (0.50)~~
   - ~~GEOG428 - Spatial Demography (0.50)~~
   - ~~PLAN351 - Multivariate Statistics (0.50)~~
   - ~~PLAN353 - Spatial Analysis (0.50)~~
   - ~~PLAN418 - Spatial Demography (0.50)~~
   - ~~Complete all of the following~~
   - ~~Complete 3.0 units, including at least one 1.0 unit course, from the following course list.~~
   - ~~Choose any of the following:~~
   - ~~GEOG371 - Advanced Remote Sensing Techniques (0.50)~~
   - ~~GEOG381 - Advanced Geographic Information Systems (0.50)~~
   - ~~GEOG387 - Spatial Databases (0.50)~~
   - ~~GEOG471 - Remote Sensing Project (1.00)~~
   - ~~GEOG481 - Geographic Information Systems Project (1.00)~~
   - ~~GEOG483 - Civic Technology and Digital Infrastructures (0.50)~~
   - ~~GEOG484 - Machine Learning in Geospatial Science (0.50)~~
   - ~~GEOG487 - Management Issues in Geographic Information Systems (0.50)~~
   - ~~PLAN381 - Advanced Geographic Information Systems (0.50)~~
   - ~~PLAN387 - Spatial Databases (0.50)~~
   - ~~PLAN481 - Geographic Information Systems Project (1.00)~~
   - ~~PLAN487 - Management Issues in Geographic Information Systems (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the specialization 1.0 unit course requirement, from the 3.0 units course list, by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# GA-Geomatics Specialization - Geographic Information Systems Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the CEC and GEM programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**

Not Applicable,

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**

No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the Geomatics specialization, there was consensus that students can focus on developing their skillset in either GIS or remote sensing, and so the specialization is being divided into two separate credentials (one for GIS and one for remote sensing [new specialization]). Previously, the specialization included both course streams.

Further this revision ensures student skillsets, as presented on their degree, will offer greater clarity. The term 'Geomatics' is often associated with surveying, so the change to reference 'GIS' is clearer.

Additional constraints about the thesis removed, since the thesis will no longer count towards the specialization.

Combination with the new Certificate in GIS is allowed.

GEOG381, GEOG387, and GEOG481, course subject will change to GDS, once approved by SUC.

Related agenda proposals:

- CEC-Remote Sensing Specialization
- GA-Remote Sensing Specialization
- GEM-Remote Sensing Specialization
- CEC-Geomatics Specialization
- GEM-Geomatics Specialization
- PLAN387
- GEOG487
- PLAN487

**Consultations (Departmental)**

Consultations with Planning have occurred. Planning expressed support during a meeting held on Wed. Sept. 17, 2025.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

Proposed

**Program/Plan Name**
Geographic Information Systems Specialization

Existing

**Program/Plan Name**
Geomatics Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geography & Aviation

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a total of 2.5 units.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
    - **2.5Units to Complete**
    - 
    - **Complete all of the following**
    - **Complete all the following:**
    - **GEOG387 - Spatial Databases (0.50)**
    - 
    - **Complete 1 of the following:**
    - **GEOG318 - Spatial Analysis (0.50)**
    - **PLAN353 - Spatial Analysis (0.50)**
    - 
    - **Complete 1 of the following:**
    - **GEOG381 - Advanced Geographic Information Systems (0.50)**
    - **PLAN381 - Advanced Geographic Information Systems (0.50)**
    - 
    - **Complete 1 of the following:**
    - **GEOG481 - Geographic Information Systems Project (1.00)**
    - **PLAN481 - Geographic Information Systems Project (1.00)**
    - 
    - **Grand Total Units: 2.5**
    - ~~0Units to Complete~~
    - ~~No Rules~~

1. Required Courses
    - 
    - **No Rules**
    - ~~Complete all of the following~~
    - ~~Complete all the following:~~
    - ~~GEOG271 - Earth from Space Using Remote Sensing (0.50)~~
    - ~~GEOG310 - Geodesy and Surveying (0.50)~~
    - ~~Complete 1 of the following:~~
    - ~~GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)~~
    - ~~PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)~~
    - ~~Complete 2 of the following:~~
    - ~~AVIA270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)~~
    - ~~GEOG270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~GEOG325 - Geographies of Health (0.50)~~
    - ~~GEOG428 - Spatial Demography (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~PLAN418 - Spatial Demography (0.50)~~

- ~~Complete all of the following~~
- ~~Complete 3.0 units, including at least one 1.0 unit course, from the following course list.~~
- ~~Choose any of the following:~~
- ~~GEOG371 - Advanced Remote Sensing Techniques (0.50)~~
- ~~GEOG381 - Advanced Geographic Information Systems (0.50)~~
- ~~GEOG387 - Spatial Databases (0.50)~~
- ~~GEOG471 - Remote Sensing Project (1.00)~~
- ~~GEOG481 - Geographic Information Systems Project (1.00)~~
- ~~GEOG483 - Civic Technology and Digital Infrastructures (0.50)~~
- ~~GEOG484 - Machine Learning in Geospatial Science (0.50)~~
- ~~GEOG487 - Management Issues in Geographic Information Systems (0.50)~~
- ~~PLAN381 - Advanced Geographic Information Systems (0.50)~~
- ~~PLAN387 - Spatial Databases (0.50)~~
- ~~PLAN481 - Geographic Information Systems Project (1.00)~~
- ~~PLAN487 - Management Issues in Geographic Information Systems (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the specialization 1.0 unit course requirement, from the 3.0 units course list, by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# GEM-Geomatics Specialization - Geographic Information Systems Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Students who began their studies in Fall 2025 will be shifted over to the Fall 2026 calendar, so this specialization will apply to them as well. No course substitutions will be required.

All students will be communicated about the change in writing via email, as well as through in-class visits by the Associate Chair, Undergraduate, to explain the calendar changes.

Changes also apply to identical specialization for the CEC and GEM programs.

**Is the credential name changing?**
Yes,

**Impact of Credential Name Change**
The name change applies only to future students (current students may opt in),

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

After an extensive curriculum review, including departmental and student consultation, we are making changes to all our specializations to:

1. Reduce the number of required units to make them more achievable for students and align with the specialization unit requirements in other units in our faculty.

2. Avoid overlap in course requirements with other specializations.

3. Ensure all courses align with the learning objectives of the specializations.

For the Geomatics specialization, there was consensus that students can focus on developing their skillset in either GIS or remote sensing, and so the specialization is being divided into two separate credentials (one for GIS and one for remote sensing). Previously, the specialization included both course streams.

Further this revision ensures student skillsets, as presented on their degree, will offer greater clarity. The term 'Geomatics' is often associated with surveying, so the change to reference 'GIS' is clearer.

Additional constraints about the thesis removed, since the thesis will no longer count towards the specialization.

Combination with the new Certificate in GIS is allowed.

GEOG381, GEOG387, and GEOG481, course subject will change to GDS, once approved by SUC.

Related agenda proposals:

- CEC-Remote Sensing Specialization
- GA-Remote Sensing Specialization
- GEM-Remote Sensing Specialization
- CEC-Geomatics Specialization
- GA-Geomatics Specialization
- PLAN387
- GEOG487
- PLAN487

**Consultations (Departmental)**

Consultations with Planning have occurred. Planning expressed support during a meeting held on Wed. Sept. 17, 2025.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Faculty**

Faculty of Environment

**Undergraduate Credential Type**

Specialization

Proposed

**Program/Plan Name**

Geographic Information Systems Specialization

Existing

**Program/Plan Name**

Geomatics Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Geography & Environmental Management, or JH-Geography & Environmental Management

**Admissions Entry Point**
Declare Plan,

**Declaration Requirements**

- It is recommended that students declare the addition of a specialization as early as possible by submitting a Plan Modification Form.

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

Proposed

**Graduation Requirements**

- Complete a total of 2.5 units.

Existing

**Graduation Requirements**

- Complete a total of 5.5 units.

1. Required Courses
    - **2.5Units to Complete**
    -
    - **Complete all of the following**
    - **Complete all the following:**
    - **GEOG387 - Spatial Databases (0.50)**
    -
    - **Complete 1 of the following:**
    - **GEOG318 - Spatial Analysis (0.50)**
    - **PLAN353 - Spatial Analysis (0.50)**
    -
    - **Complete 1 of the following:**
    - **GEOG381 - Advanced Geographic Information Systems (0.50)**
    - **PLAN381 - Advanced Geographic Information Systems (0.50)**
    -
    - **Complete 1 of the following:**
    - **GEOG481 - Geographic Information Systems Project (1.00)**
    - **PLAN481 - Geographic Information Systems Project (1.00)**
    -
    - **Grand Total Units: 2.5**
    - ~~0Units to Complete~~
    - ~~No Rules~~

1. Required Courses
    -
    - **No Rules**
    - ~~Complete all of the following~~
    - ~~Complete all the following:~~
    - ~~GEOG271 - Earth from Space Using Remote Sensing (0.50)~~
    - ~~GEOG310 - Geodesy and Surveying (0.50)~~
    - ~~Complete 1 of the following:~~
    - ~~GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)~~
    - ~~PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)~~
    - ~~Complete 2 of the following:~~
    - ~~AVIA270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)~~
    - ~~GEOG270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements (0.50)~~
    - ~~GEOG316 - Multivariate Statistics (0.50)~~
    - ~~GEOG318 - Spatial Analysis (0.50)~~
    - ~~GEOG325 - Geographies of Health (0.50)~~
    - ~~GEOG428 - Spatial Demography (0.50)~~
    - ~~PLAN351 - Multivariate Statistics (0.50)~~
    - ~~PLAN353 - Spatial Analysis (0.50)~~
    - ~~PLAN418 - Spatial Demography (0.50)~~
    - ~~Complete all of the following~~
    - ~~Complete 3.0 units, including at least one 1.0 unit course, from the following course list.~~
    - ~~Choose any of the following:~~
    - ~~GEOG371 - Advanced Remote Sensing Techniques (0.50)~~
    - ~~GEOG381 - Advanced Geographic Information Systems (0.50)~~
    - ~~GEOG387 - Spatial Databases (0.50)~~
    - ~~GEOG471 - Remote Sensing Project (1.00)~~
    - ~~GEOG481 - Geographic Information Systems Project (1.00)~~
    - ~~GEOG483 - Civic Technology and Digital Infrastructures (0.50)~~
    - ~~GEOG484 - Machine Learning in Geospatial Science (0.50)~~
    - ~~GEOG487 - Management Issues in Geographic Information Systems (0.50)~~
    - ~~PLAN381 - Advanced Geographic Information Systems (0.50)~~
    - ~~PLAN387 - Spatial Databases (0.50)~~

- ~~PLAN481 - Geographic Information Systems Project (1.00)~~
- ~~PLAN487 - Management Issues in Geographic Information Systems (0.50)~~

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Proposed

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.

Existing

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. GEOG490A and GEOG490B Thesis (1.5 units) topics - if related to the specialization - may be approved to count towards the specialization 1.0 unit course requirement, from the 3.0 units course list, by the Associate Chair, Undergraduate Studies, Department of Geography and Environmental Management.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# H-Knowledge Integration - Knowledge Integration (Bachelor of Knowledge Integration - Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
No,

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**

No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

Removing retired course.

GEOG courses being relabeled GDS will be updated automatically upon SUC approval.

Related agenda proposals:

- GEOG300

**Consultations (Departmental)**

No consultations required.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

School of Environment, Resources and Sustainability

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Major

**Program Type**
Honours

**Degree**
Bachelor of Knowledge Integration

**Program/Plan Name**
Knowledge Integration (Bachelor of Knowledge Integration - Honours)

**Systems of Study**
Regular,

## Admissions

**Admissions Entry Point**
Both,

**Declaration Requirements**

A Bachelor of Knowledge Integration (BKI) degree can be combined with any other University of Waterloo degree plan which academic units in Environment and other faculties have chosen to make available for joint honours. Knowledge Integration may be the primary credential (i.e., Bachelor of Knowledge Integration with "Z" academic plan) or the secondary credential (i.e., Bachelor of "Y" in academic plan "X" with Joint Honours Knowledge Integration).

## Requirements Information

**Invalid Combinations**

Yes,

**List of Invalid Combinations**

Diploma in Knowledge Integration

**Average Requirement**

Yes,

**Minimum Average(s) Required**

- A minimum cumulative overall average of 65.0%.
- A minimum cumulative major average of 70.0% from all the required courses listed below, all INTEG courses, and all courses counted towards the breadth requirements.

**Graduation Requirements**

**Unit Requirements**

- Complete a total of 20.5 units:
  - Complete 7.5 units of required courses.
  - Complete 8.0 units of elective courses, a maximum of 1.0 LAB unit may be counted.
  - Complete 5.0 units of breadth courses.
- At least 13.5 units must be at the 200-level or above.

**Undergraduate Communications Requirement**

Students are required to complete ENVS131 with a final grade of 60.0% or higher to meet the Undergraduate Communication Requirement (UCR). The UCR milestone on a student's academic record will indicate one of the following rules has been met:

1. ENVS131 has been completed with a final grade of 60.0% or higher.
2. The UCR milestone has been earned by the student while enrolled in another University of Waterloo faculty.
3. At time of admission to the Faculty of Environment, a transfer credit from an external accredited post-secondary institution has been granted for ENVS131.

**Notes**

1. If a grade of 60.0% or higher is not achieved in ENVS131, a student will be eligible to repeat the course to meet the UCR milestone requirement. See Faculty of Environment Regulations for information on repeating courses.
2. Earning an UCR milestone and the satisfactory completion of ENVS131 are two unique and distinct degree requirements. Both requirements must be satisfied to be eligible for a Bachelor of Knowledge Integration degree.
3. Students who have not attained the UCR milestone by the end of their 2B term must meet with their academic advisor to discuss the completion of this requirement.

**Course Requirements (units)**

Required Courses

- 0Units to Complete
- No Rules

**Course Requirements (no units)**

Required Courses

- Complete all of the following
- Complete all the following:
  - COMMST223 - Public Speaking (0.50)
  - ENVS131 - Communications for Environmental Professions (0.50)
  - ENVS195 - Introduction to Environmental Studies (0.50)
  - INTEG120 - The Art and Science of Learning (0.50)
  - INTEG121 - Collaboration, Design Thinking, and Problem Solving (0.50)
  - INTEG230 - The Museum Course: Preparation and Field Trip (0.25)
  - INTEG320 - The Museum Course: Research and Design (0.50)
  - INTEG321 - The Museum Course: Practicum and Presentation (0.75)
  - INTEG340 - Research Design and Methods (0.50)
  - INTEG420A - Senior Honours Project A (0.50)
  - INTEG420B - Senior Honours Project B (1.00)
  - PHIL145 - Critical Thinking (0.50)
- Complete 1 of the following:
  - INTEG220 - Nature of Scientific Knowledge (0.50)
  - PHIL290 - Nature of Scientific Knowledge (0.50)
- Complete 1 of the following:
  - INTEG221 - The Social Nature of Knowledge (0.50)
  - PHIL291 - The Social Nature of Knowledge (0.50)

1. Breadth Courses List
   - 
   - Complete all of the following
   - Computer Science Requirement
   - Complete 1 of the following:
   - CS105 - Introduction to Computer Programming 1 (0.50)
   - CS115 - Introduction to Computer Science 1 (0.50)
   - CS135 - Designing Functional Programs (0.50)
   - CS145 - Designing Functional Programs (Advanced Level) (0.50)
   - CS200 - Concepts for Advanced Computer Usage (0.50)
   - 
   - Conflict Management Requirement
   - Complete 1 of the following:
   - COMMST432 - Conflict Management (0.50)
   - ERS310 - Peace and the Environment (0.50)
   - LS271 - Conflict Resolution (0.50)
   - LS319 - Negotiation: Theories and Strategies (0.50)
   - PACS201 - Roots of Conflict, Violence, and Peace (0.50)
   - PACS202 - Conflict Resolution (0.50)
   - PACS310 - Peace and the Environment (0.50)
   - PACS313 - Community Conflict Resolution (0.50)
   - PACS323 - Negotiation: Theories and Strategies (0.50)
   - PACS327 - Cultural Approaches to Conflict Resolution (0.50)
   - 
   - English Requirement

- Complete 1 ENGL course at the 100- or 200-level
- Ethics and Social Justice Requirement
- Complete 1 of the following:
- ARBUS202 - Professional and Business Ethics (0.50)
- BLKST201 - Taking B(l)ack History (0.50)
- BLKST203 - Introduction to Anti-Racist Communication (0.50)
- COMMST203 - Introduction to Anti-Racist Communication (0.50)
- ENGL225 - Introduction to Anti-Racist Communication (0.50)
- ENVS105 - Environmental Sustainability and Ethics (0.50)
- ERS225 - Gendering Environmental Politics (0.50)
- GSJ201 - Gender and Social Justice in Popular Culture (0.50)
- GSJ205 - Technology, Gender, and Social Justice (0.50)
- GSJ207 - Entrepreneurship, Gender, and Social Justice (0.50)
- GSJ304 - Research as Resistance (0.50)
- INDEV300 - Culture and Ethics (0.50)
- LS352 - Human Rights (0.50)
- PACS311 - Doing Development: Issues of Justice and Peace (0.50)
- PACS314 - Restorative Justice and Transformative Education (0.50)
- PACS315 - Engineering and Peace (0.50)
- PACS316 - Violence, Non-Violence, and War (0.50)
- PACS332 - Ethics of Peacebuilding (0.50)
- PHIL215 - Professional and Business Ethics (0.50)
- PHIL221 - Ethics (0.50)
- PHIL224 - Environmental Ethics (0.50)
- PHIL226 - Biomedical Ethics (0.50)
- PHIL227 - Culture and Ethics (0.50)
- PHIL228 - Ethics and Artificial Intelligence (0.50)
- PHIL319J - Ethics of End-of-Life Care (0.50)
- PHIL320 - Topics in Value Theory (0.50)
- PHIL326J - Philosophy of Social Justice (0.50)
- PHIL328 - Human Rights (0.50)
- PHIL329 - Violence, Non-Violence, and War (0.50)
- PHIL420 - Studies in Ethics (0.50)
- RCS383 - Justice, Peace, and Development (0.50)
-
- Languages Requirement
- Complete 1 of the following
- Complete all the following:
- ASL101R - American Sign Language 1 (0.50)
- ASL102R - American Sign Language 2 (0.50)
-
- Complete 2 of the following:
- ARABIC101R - Introduction to Arabic 1 (0.50)
- ARABIC102R - Introduction to Arabic 2 (0.50)
- ARABIC201R - Intermediate Arabic 1 (0.50)
- ARABIC202R - Intermediate Arabic 2 (0.50)
-
- Complete 2 of the following:
- CHINA101R - First-Year Chinese 1 (0.50)
- CHINA102R - First-Year Chinese 2 (0.50)
- CHINA120R - Advanced First-Year Chinese (0.50)
- CHINA201R - Second-Year Chinese 1 (0.50)
- CHINA202R - Second-Year Chinese 2 (0.50)
- CHINA301R - Third-Year Chinese 1 (0.50)
- CHINA302R - Third-Year Chinese 2 (0.50)
- CHINA310R - Chinese for Business Settings (0.50)
- CHINA320R - Chinese in Mass Media (0.50)
-
- Complete all the following:
- CROAT101 - Elementary Croatian 1 (0.50)
- CROAT102 - Elementary Croatian 2 (0.50)
-

- Complete all the following:
- DUTCH101 - Elementary Dutch 1 (0.50)
- DUTCH102 - Elementary Dutch 2 (0.50)
-
- Complete 2 of the following:
- FR151 - Basic French 1 (0.50)
- FR152 - Basic French 2 (0.50)
- FR192A - French Language 1: Module 1 (0.50)
- FR192B - French Language 1: Module 2 (0.50)
- FR251 - French Language 2: Module 1 (0.50)
- FR252 - French Language 2: Module 2 (0.50)
-
- Complete 2 of the following:
- GER101 - Elementary German 1 (0.50)
- GER102 - Elementary German 2 (0.50)
- GER201 - Intermediate German 1 (0.50)
- GER202 - Intermediate German 2 (0.50)
- GER211 - Contemporary German Language and Culture (0.50)
- GER250 - Performance German 1 (0.50)
- GER303 - Interactive German Language and Culture (0.50)
- GER304 - Reading and Translating (0.50)
- GER307 - German for Professional Purposes (0.50)
- GER308 - German Through Comics (0.50)
- GER331 - Exploring German Language and Literature (0.50)
- GER350 - Performance German 2 (0.50)
-
- Complete 2 of the following:
- GRK101 - Introductory Ancient Greek 1 (0.50)
- GRK102 - Introductory Ancient Greek 2 (0.50)
- RCS101 - Introductory Ancient Greek 1 (0.50)
- RCS102 - Introductory Ancient Greek 2 (0.50)
-
- Complete 2 of the following:
- INDG101 - Mohawk Language 1 (0.50)
- INDG102 - Mohawk Language 2 (0.50)
- MOHAWK101R - Mohawk Language 1 (0.50)
- MOHAWK102R - Mohawk Language 2 (0.50)
-
- Complete all the following:
- ITAL101 - Introduction to Italian Language 1 (0.50)
- ITAL102 - Introduction to Italian Language 2 (0.50)
-
- Complete 2 of the following:
- JAPAN101R - First-Year Japanese 1 (0.50)
- JAPAN102R - First-Year Japanese 2 (0.50)
- JAPAN111R - Japanese for Business 1 (0.50)
- JAPAN112R - Japanese for Business 2 (0.50)
- JAPAN201R - Second-Year Japanese 1 (0.50)
- JAPAN202R - Second-Year Japanese 2 (0.50)
- JAPAN301R - Third-Year Japanese 1 (0.50)
- JAPAN302R - Third-Year Japanese 2 (0.50)
-
- Complete 2 of the following:
- KOREA101R - First-Year Korean 1 (0.50)
- KOREA102R - First-Year Korean 2 (0.50)
- KOREA201R - Second-Year Korean 1 (0.50)
- KOREA202R - Second-Year Korean 2 (0.50)
- KOREA301R - Third-Year Korean 1 (0.50)
- KOREA302R - Third-Year Korean 2 (0.50)
-
- Complete all the following:
- LAT101 - Introductory Latin 1 (0.50)

- LAT102 - Introductory Latin 2 (0.50)
-
- Complete all the following:
- RUSS101 - Elementary Russian 1 (0.50)
- RUSS102 - Elementary Russian 2 (0.50)
-
- Complete 2 of the following:
- SPAN101 - Introduction to Spanish 1 (0.50)
- SPAN102 - Introduction to Spanish 2 (0.50)
- SPAN201A - Intermediate Spanish 1 (0.50)
- SPAN201B - Intermediate Spanish 2 (0.50)
- SPAN210 - Spanish Conversation (0.50)
-
- Mathematics Requirement
- Complete 2 of the following:
- ECON211 - Introduction to Mathematical Economics (0.50)
- ENVS178 - Environmental Applications of Data Management and Statistics (0.50)
- MATH103 - Introductory Algebra for Arts and Social Science (0.50)
- MATH104 - Introductory Calculus for Arts and Social Science (0.50)
- MATH106 - Applied Linear Algebra 1 (0.50)
- MATH114 - Linear Algebra for Science (0.50)
- MATH127 - Calculus 1 for the Sciences (0.50)
- MATH128 - Calculus 2 for the Sciences (0.50)
- MSE331 - Introduction to Optimization (0.50)
- PHIL240 - Introduction to Formal Logic (0.50)
-
- Natural and Physical Sciences Requirement
- Complete all of the following
- Complete 0.50 unit from the following lists of science courses; if a course offers a laboratory course (designated by an L), it must also be taken. See Additional Constraints.
- Choose any of the following:
- ANTH204 - Biological Anthropology (0.50)
- ANTH355 - Human Osteology (0.50)
- ANTH455 - Skeletal Biology and Forensics (0.50)
-
- Choose any of the following:
- BIOL130 - Introductory Cell Biology (0.50)
- BIOL130L - Cell Biology Laboratory (0.25)
- BIOL201 - Human Anatomy (0.50)
- BIOL211 - Introductory Vertebrate Zoology (0.50)
- BIOL235 - Foundations of Molecular Biology (0.50)
- BIOL240 - Fundamentals of Microbiology (0.50)
- BIOL240L - Microbiology Laboratory (0.25)
- BIOL241 - Introduction to Applied Microbiology (0.50)
- BIOL266 - Introduction to Computational Biology (0.50)
- BIOL302 - Functional Histology (0.50)
- BIOL310 - Invertebrate Zoology (0.50)
- BIOL325 - Flowering Plants (0.50)
- BIOL354 - Environmental Toxicology (0.50)
- BIOL365 - Methods in Bioinformatics (0.50)
- BIOL370 - Comparative Animal Physiology: Environmental Aspects (0.50)
- BIOL371 - Comparative Animal Physiology: Evolutionary Themes (0.50)
- BIOL373 - Principles of Human Physiology 2 (0.50)
- BIOL373L - Human Physiology Laboratory (0.25)
- BIOL376 - Cellular Neurophysiology (0.50)
- BIOL458 - Quantitative Ecology (0.50)
- BIOL469 - Genomics (0.50)
- BIOL470 - Methods of Aquatic Ecology (0.50)
- BIOL477L - Techniques in Animal Physiology (0.50)
-
- Choose any of the following:
- CHEM120 - General Chemistry 1 (0.50)

- CHEM120L - General Chemistry Laboratory 1 (0.25)
- CHEM123 - General Chemistry 2 (0.50)
- CHEM123L - General Chemistry Laboratory 2 (0.25)
-
- Choose any of the following:
- EARTH121 - Introductory Earth Sciences (0.50)
- EARTH121L - Introductory Earth Sciences Laboratory (0.25)
- EARTH123 - Introductory Hydrology (0.50)
- EARTH223 - Field Methods in Hydrology (0.50)
- EARTH231 - Mineralogy (0.50)
- EARTH235 - Stratigraphic Approaches to Understanding Earth's History (0.50)
- EARTH238 - Introductory Structural Geology (0.50)
- EARTH260 - Introductory Applied Geophysics (0.50)
- EARTH342 - Geomorphology and GIS Applications (0.50)
-
- Choose any of the following:
- ENVS200 - Field Ecology (0.50)
- ENVS300 - Vascular Plants of Southern Ontario (0.50)
- ENVS444 - Ecosystem and Resource Management in Parks/Natural Areas (0.50)
-
- Choose any of the following:
- GEOG181 - Designing Effective Maps (0.50)
- GEOG205 - Principles of Geomorphology (0.50)
- GEOG209 - Hydroclimatology (0.50)
- GEOG271 - Earth from Space Using Remote Sensing (0.50)
- GEOG281 - Introduction to Geographic Information Systems (GIS) (0.50)
- GEOG303 - Physical Hydrology (0.50)
- GEOG304 - Carbon in the Biosphere (0.50)
- GEOG310 - Geodesy and Surveying (0.50)
- GEOG320 - The Cryosphere (0.50)
- GEOG371 - Advanced Remote Sensing Techniques (0.50)
- GEOG407 - Environmental Hydrology of Terrestrial Ecosystems (0.50)
- GEOG408 - Earth's Future Climates (0.50)
- GEOG420 - Ice Sheets and Glaciers (0.50)
- GEOG428 - Spatial Demography (0.50)
-
- Choose any of the following:
- KIN100 - Regional Human Anatomy (0.50)
- KIN100L - Regional Human Anatomy Laboratory (0.25)
- KIN121 - Biomechanics of Human Movement (0.50)
- KIN121L - Biomechanics of Human Movement Laboratory (0.25)
- KIN221 - Advanced Biomechanics of Human Movement (0.50)
- KIN221L - Advanced Biomechanics of Human Movement Laboratory (0.25)
- KIN301 - Human Anatomy of the Central Nervous System (0.50)
-
- Choose any of the following:
- MNS101 - Materials and Nanosciences in the Modern World (0.50)
-
- Choose any of the following:
- PHYS111 - Physics 1 (0.50)
- PHYS111L - Physics 1 Laboratory (0.25)
- PHYS112 - Physics 2 (0.50)
- PHYS112L - Physics 2 Laboratory (0.25)
- PHYS121 - Mechanics (0.50)
- PHYS121L - Mechanics Laboratory (0.25)
- PHYS122 - Waves, Electricity and Magnetism (0.50)
- PHYS122L - Waves, Electricity and Magnetism Laboratory (0.25)
- PHYS175 - Introduction to the Universe (0.50)
- PHYS175L - Introduction to the Universe Laboratory (0.25)
-
- Choose any of the following:
- PLAN281 - Introduction to Geographic Information Systems (GIS) (0.50)

- PLAN418 - Spatial Demography (0.50)
-
- Statistics Requirement
- Complete 1 of the following:
- ARTS280 - Statistics for Arts Students (0.50)
- ECON221 - Statistics for Economists (0.50)
- ENVS278 - Applied Statistics for Environmental Research (0.50)
- LS280 - Social Statistics (0.50)
- PSCI314 - Quantitative Analysis (0.50)
- PSYCH292 - Basic Data Analysis (0.50)
- SDS250R - Social Statistics (0.50)
- SRF230 - Introduction to Statistics (0.50)
- SOC280 - Social Statistics (0.50)
- STAT202 - Introductory Statistics for Scientists (0.50)
- STAT220 - Probability (Non-Specialist Level) (0.50)
- ~~GEOG300 - Geomorphology and the Southern Ontario Environment (0.50)~~

**Are there cross-listed courses listed in requirements?**

Yes,

**Cross-Listings Options**

All cross-listings to be displayed,

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. INTEG10 should appear on a student's course schedule every term.
3. INTEG340 can be substituted with an alternative research methods course with approval from the Associate Chair, Undergraduate Studies, Knowledge Integration.
4. Students completing a joint major or concurrent degree that includes an equivalent senior research project may request that the Associate Chair, Undergraduate Studies, Knowledge Integration approve the associated courses as equivalent to INTEG420A and INTEG420B. Note that there may be additional requirements involved in such an arrangement, which is required to be formally organized in advance of taking the equivalent course sequence.
5. Breadth requirements:
    1. For courses taken towards the natural and physical sciences breadth requirement:
        1. If BIOL235 is taken, BIOL335L must also be taken in a subsequent term.
        2. If BIOL370 or BIOL371 is taken, BIOL477L must also be taken.
        3. If EARTH123 is taken, EARTH223 must also be taken.
    2. In exceptional cases, students may request to have a course count towards a breadth requirement that is not listed above. In particular, students transferring from other academic plans or pursuing Joint Honours may find that some of their courses may meet breadth requirements. Students considering these options should consult with the Knowledge Integration academic advisor.

**Notes**

- See list of academic advisors.
- See Knowledge Integration website for recommended course sequence and for guidance on breadth courses, including suggested courses for Year One and Year Two.

## Specializations

**Specializations for this Major**

Yes - Optional,

**Specialization Details**

Students (including Joint Honours) may choose to focus their elective choices by completing one, or both, available specializations.

**Specializations List**

Collaborative Design Specialization, or Science, Technology, & Society Specialization

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# Science, Technology, & Society Specialization - Science, Technology, and Society Specialization

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-03

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
Yes,

**Impact on Existing Students**

Fewer course options in extensive list.

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

ERS265 and ERS406 are being retired. SCI205 is a new cross-listing with GEOG207.

Related agenda proposals:

- ERS265
- ERS406
- GEOG207
- SCI205

**Consultations (Departmental)**

Consultations with Science.

## General Program/Plan Information

**Faculty**

Faculty of Environment

**Academic Unit**

School of Environment, Resources and Sustainability

**Faculty**
Faculty of Environment

**Undergraduate Credential Type**
Specialization

**Program/Plan Name**
Science, Technology, and Society Specialization

## Admissions

**Specialization is available for students in the following majors**

H-Knowledge Integration

**Admissions Entry Point**
Declare Plan,

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
No,

**Graduation Requirements**

- Complete a total of 3.5 units:
  - 2.0 units of required courses.
  - 1.5 units of approved courses (see Additional Constraints).

1. Required Courses
   - 2Units to Complete
   - 
   - Complete all of the following
   - Complete all the following:
   - INTEG120 - The Art and Science of Learning (0.50)
   - 
   - Complete 1 of the following:
   - INTEG220 - Nature of Scientific Knowledge (0.50)
   - PHIL290 - Nature of Scientific Knowledge (0.50)
   - 
   - Complete 1 of the following:
   - INTEG221 - The Social Nature of Knowledge (0.50)
   - PHIL291 - The Social Nature of Knowledge (0.50)
   - 

- Complete 1 of the following:
- INTEG240 - Bullshit, Bias, and Bad Arguments (0.50)
- INTEG375 - Special Topics in Knowledge Integration (0.50)
- INTEG410 - Interdisciplinary Collaboration (0.50)
- INTEG441 - Hard Decisions and Wicked Problems (0.50)
- INTEG475 - Special Topics in Knowledge Integration (0.50)
-
- Approved Courses List
- 1.5Units to Complete
-
- Complete 3 of the following:
- ANTH303 - Anthropology of Digital Media (0.50)
- ANTH347 - Medical Anthropology (0.50)
- ANTH430 - Science as Practice and Culture (0.50)
- ARTS490 - Fourth-Year Topics in Arts Disciplines (0.50)
- ENGL108D - Digital Lives (0.50)
- ENGL293 - Introduction to Digital Media Studies (0.50)
- ENVS210 - Future Studies (0.50)
- ENVS310 - Future Cities: Integrating Future Thinking into Urban Decisions (0.50)
- ERS316 - Urban Water and Wastewater Systems: Integrated Planning and Management (0.50)
- ERS361 - Food Systems and Sustainability (0.50)
- ERS372 - First Nations and the Environment (0.50)
- ERS404 - Global Environmental Governance (0.50)
- ERS422 - Biosphere Reserves as Social-Ecological Systems (0.50)
- ERS454 - Parks and Protected Areas: Issues and Trends (0.50)
- ERS462 - Global Food and Agricultural Politics (0.50)
- GEOG203 - Environment and Development in a Global Perspective (0.50)
- GEOG207 - Climate Change Fundamentals (0.50)
- GEOG306 - Human Dimensions of Natural Hazards (0.50)
- GEOG307 - Societal Adaptation to Climate Change (0.50)
- GEOG311 - Economic Geography and Society (0.50)
- GEOG361 - Food Systems and Sustainability (0.50)
- GEOG426 - Geographies of Development (0.50)
- GEOG432 - Health and the Built Environment (0.50)
- GEOG462 - Global Food and Agricultural Politics (0.50)
- HIST212 - The Computing Society (0.50)
- HIST216 - From Gutenberg to Zuckerberg: A (Long) History of the Internet (0.50)
- HLTH420 - Health and the Built Environment (0.50)
- INDEV262 - Introduction to Global Emerging Cities (0.50)
- LS413 - Surveillance and Society (0.50)
- PACS301 - Special Topics in Peace and Conflict Studies 1 (0.50)
- PACS302 - Special Topics in Peace and Conflict Studies 2 (0.50)
- PHIL208 - Philosophy Through Science Fiction (0.50)
- PHIL224 - Environmental Ethics (0.50)
- PHIL226 - Biomedical Ethics (0.50)
- PHIL252 - Quantum Mechanics for Everyone (0.50)
- PHIL256 - Introduction to Cognitive Science (0.50)
- PHIL259 - Philosophy of Technology (0.50)
- PHIL271 - Special Topics (0.50)
- PHIL358 - Topics in Philosophy of Science (0.50)
- PHIL447 - Seminar in Cognitive Science (0.50)
- PLAN240 - Environmental Planning and Policy (0.50)
- PLAN246 - Tools for Public Participation (0.50)
- PLAN262 - Introduction to Global Emerging Cities (0.50)
- PLAN333 - Neighbourhood and Community Planning (0.50)
- PLAN431 - Issues in Housing (0.50)
- PLAN432 - Health and the Built Environment (0.50)
- PLAN433 - Social Issues in Planning (0.50)
- PLAN440 - Urban Services (0.50)
- PSCI432 - Global Environmental Governance (0.50)
- PSCI488 - Global Food and Agricultural Politics (0.50)
- PSYCH256 - Introduction to Cognitive Science (0.50)

- PSYCH447 - Seminar in Cognitive Science (0.50)
- RCS383 - Justice, Peace, and Development (0.50)
- **Course Not Found**
- SCI252 - Quantum Mechanics for Everyone (0.50)
- SOC232 - Technology and Social Change (0.50)
- SOC248 - Health, Illness, and Society (0.50)
- SOC312 - Sociology of Science (0.50)
- SOC413 - Surveillance and Society (0.50)
- SOC431 - Science as Practice and Culture (0.50)
- STV100 - Society, Technology and Values: Introduction (0.50)
- STV201 - Society, Technology and Values: Special Topics (0.50)
- STV202 - Design and Society (0.50)
- STV205 - Cybernetics and Society (0.50)
- STV208 - Artificial Intelligence and Society: Impact, Ethics, and Equity (0.50)
- STV210 - The Computing Society (0.50)
- STV302 - Information Technology and Society (0.50)
- STV304 - Technology in Canadian Society (0.50)
- STV305 - Technology, Society and the Modern City (0.50)
- STV306 - Biotechnology and Society (0.50)
- STV400 - Society, Technology and Values: Senior Project (0.50)
- STV401 - Society, Technology and Values: Advanced Topics (0.50)
-
- Grand Total Units: 3.5
- ~~ERS265 - Water: Environmental History and Change (0.50)~~
- ~~ERS406 - Paths to Sustainability (0.50)~~

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**

Yes,

**Cross-Listings Options**

All cross-listings to be displayed,

**Additional Constraints**

1. Students may only complete one course from any cross-listed set.
2. Certain courses can only be used towards this Specialization if students enrol in specific topics:
    1. To use ARTS490, the topic must be "The Socio-Cultural and Political Implications of Artificial Intelligence".
    2. To use INTEG375, the topic must be "Hands on Sustainability" or "Science and Technology".
    3. To use INTEG475, the topic must be "Open Science and Technology".
3. Of the approved courses list, choices must be from at least two subject codes (i.e., ERS, PLAN, STV,

etc.), and two courses must be at the 300-level or above.

**Notes**

- See list of academic advisors.

## Specializations

## Undergraduate Plan Guidelines

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment

## Dependencies

# H-Sustainability & Financial Management - Sustainability and Financial Management (Bachelor of Sustainability and Financial Management - Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
No,

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
No,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

Adding SCI205, a new cross-list to GEOG207 which is a required course.

Related agenda proposals:

GEOG207 (new cross-list added)

SCI205 (new cross-list)

**Consultations (Departmental)**

consultation with Science, Environment, and SFM.

## General Program/Plan Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Faculty**

Faculties of Arts and Environment

**Undergraduate Credential Type**

Major

**Program Type**

Honours

**Degree**

Bachelor of Sustainability and Financial Management

**Program/Plan Name**

Sustainability and Financial Management (Bachelor of Sustainability and Financial Management - Honours)

**Systems of Study**

Co-operative,

## Admissions

**Admissions Entry Point**

Direct Entry,

**Admission Requirements: Minimum Requirements**

Students normally apply for direct admission from high school into the first year of the Sustainability and Financial Management (co-operative education) program. Upon completing a provisional first year (maintaining a minimum 70% average in all 100-level required courses) students will formally proceed to the Sustainability and Financial Management program in second year.

## Requirements Information

**Invalid Combinations**
Yes,

**List of Invalid Combinations**

Arts and Business | Business Option | Management Studies Minor | Diploma in Sustainability

**Average Requirement**
Yes,

**Minimum Average(s) Required**

- A minimum cumulative overall average of 60.0%.
- A minimum cumulative major average of 70.0% from all the required courses listed below, all AFM courses, all ENBUS courses, all ENVS courses, all SFM courses, and all courses required for chosen specialization.

**Graduation Requirements**

- Complete a total of 20.0 units:
  - Complete 12.5 units of required courses.
  - Complete 6.0 units of required courses for one specialization.
  - Complete 1.5 units of elective courses.

**Co-operative Education Program Requirements**

- Complete a total of four PD courses: PD1, PD12, and two additional PD courses.
- Complete a total of four COOP work terms with satisfactory or better rating.

**Notes**

1. PD1 must be completed in the term prior to the first work term.
2. PD12 must be completed during the first work term.
3. Students who have attempted to secure employment for all four available work terms, but are successful in doing so for only three work terms, may be considered for a co-op degree, provided they have received credit for all three of their work terms, and they have successfully completed all academic requirements. This decision is at the discretion of the School of Accounting and Finance, Co-operative Education, and the Faculty of Arts Examinations and Standings (E&S) Committee.
4. Students are required to follow only prescribed study/work-term sequencing options through to graduation.
5. Students who meet all the academic requirements for this plan, but who do not meet the minimum requirements for a co-op degree may, in exceptional circumstances and at the discretion of the School of Accounting and Finance and the Faculty of Arts Examinations and Standings (E&S) Committee, be awarded a regular Honours Sustainability and Financial Management degree.

**Legend for Study/Work Sequence Chart**

| Key | Description |
|---|---|
| F,W,S | Terms: F=September-December; W=January-April; S=May-August |
| 1,2,3,4 plus A or B | Denotes academic year and term. |
| WT | Work term. |
| off | Neither an academic term nor a work term. |
| Sequences | Sequence 1 is the default sequence assigned to all Sustainability and Financial Management students at admission. Requests to change sequence are considered individually following the 2B and 3B terms respectively. |

**Study/Work Sequence Chart**

| Sequence | F | W | S | F | W | S | F | W | S | F | W | S | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1A | 1B | off | 2A | WT | 2B | WT | 3A | 3B | WT | 4A | WT | 4B |
| 2 | 1A | 1B | off | 2A | WT | 2B | WT | 3A | 3B | 4A | WT | WT | 4B |
| 3 | 1A | 1B | off | 2A | WT | 2B | WT | 3A | 3B | WT | WT | 4A | 4B |
| 4 | 1A | 1B | off | 2A | WT | 2B | 3A | WT | 3B | WT | 4A | WT | 4B |
| 5 | 1A | 1B | off | 2A | WT | 2B | 3A | WT | 3B | 4A | WT | WT | 4B |
| 6 | 1A | 1B | off | 2A | WT | 2B | 3A | WT | 3B | WT | WT | 4A | 4B |

1. Required Courses
   - 12.5Units to Complete
   - 
   - Complete all of the following
   - Complete all the following:
   - AFM111 - Professional Pathways and Problem-Solving (0.50)

- AFM112 - Analytic Methods for Business 1 (0.50)
- AFM113 - Analytic Methods for Business 2 (0.50)
- AFM121 - Introduction to Global Financial Markets (0.50)
- AFM182 - Introduction to Financial Reporting and Managerial Decision Making 2 (0.50)
- AFM191 - Introduction to Financial Reporting and Managerial Decision Making 1 (0.50)
- AFM205 - Introduction to Financial Services (0.25)
- AFM208 - Introduction to Assurance (0.25)
- AFM244 - Analytic Methods for Business 3 (0.50)
- AFM273 - Financial Instruments and Capital Markets (0.50)
- AFM274 - Introduction to Corporate Finance (0.50)
- AFM291 - Intermediate Financial Accounting 1 (0.50)
- AFM335 - Business Law for Financial Managers (0.50)
- AFM373 - Cases and Applications in Corporate Finance (0.50)
- AFM391 - Intermediate Financial Accounting 2 (0.50)
- ENBUS103 - Economics and Sustainability 1 (0.50)
- ENBUS104 - Economics and Sustainability 2 (0.50)
- ENVS195 - Introduction to Environmental Studies (0.50)
- ENVS200 - Field Ecology (0.50)
- SFM101 - Introduction to Sustainability and Financial Management (0.50)
- SFM201 - Social Issues in Sustainability (0.50)
- SFM205 - Advancing Sustainability: A Systems Approach (0.50)
- SFM301 - Enterprise Carbon Accounting (0.50)
- SFM309 - Sustainability and Business Ethics (0.50)
- 
- Complete 1 of the following:
- AFM433 - Business Strategy (0.50)
- ENBUS302 - Strategies for Environment and Business (0.50)
- 
- Complete 1 of the following:
- GEOG207 - Climate Change Fundamentals (0.50)
- **Course Not Found**
- 
- Grand Total Units: 12.5

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

Proposed

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

Existing

**Are there cross-listed courses listed in requirements?**
No,

**Additional Constraints**

1. The Undergraduate Communication Requirement is fulfilled by the successful completion of AFM111.

## Specializations

**Specializations for this Major**
Yes - Required (separate record),

**Specialization Details**

Students must complete one of the three available specializations.

**Specializations List**

Corporate Sustainability Specialization, Government Policy & Financial Markets Specialization, or Indigenous Entrepreneurship Specialization

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Arts | Faculty of Environment

## Dependencies

## Date 2026/01/15

Hide Empty Fields

## Meeting Information

**Agenda Page TitleSUC - 2026-02 - Consent Agenda - Faculties of Environment and Science**

**Career Level**
Undergraduate,

**Faculty/UnitFaculty of Environment**

**Date2026-02-04** **Time10:00am** **LocationNH3318**

**Summary**

**Other Business**

**For approval**

1. **Sault and Waterloo Aviation Agreement: attachments: Academic Plan Appendix.pdf *and* Articulation agreement - Sault and Waterloo Aviation 2+2 final_signed.pdf**

**Attachment(s)**

- Academic plan appendix - final.pdf
- Articulation agreement - Sault and Waterloo Aviation 2+2 final_signed.pdf

## Course Proposals

**Course Proposal Details**

**Retired:**

- **GEOG416: GEOG cross-listings w/ AVIA courses are being retired, leaving AVIA courses on the books only (with the exception of GDS (GEOG) 270/AVIA270)**

**New:**

- **AVIA370 and AVIA470: Science's new AVIA minor, and GEM's AVIA specialization**
- **GEOG402: replacing GEOG405, cross-listed with BIOL462/EARTH444**
- **SCI205: cross-listed with GEOG207**

**Change:**

- **AVIA210: renumber from AVIA310**
- **AVIA317: renumber from AVIA417**
- **AVIA/GEOG416: cross-listing removed, weight, and component changes**
- **BIOL462, EARTH444: existing courses being cross-listed with GEOG402 (new course)**
- **GEOG207: new cross-listing with SCI205 (new)**
- **GEOG270(AVIA270): change subject to GDS**

**Courses: Retire**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| GEOG 416 | Aviation Sustainability | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

**Courses: New**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| AVIA 370 | Aviation Meteorology | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| AVIA 470 | Airline Planning and Management | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| GEOG 402 | Applied Wetland Science | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| SCI 205 | Climate Change Fundamentals | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

**Courses: Changes**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| AVIA 210 | Human Factors in Aviation | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| AVIA 270 | Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| AVIA 317 | Aviation Safety | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

| | | | |
|---|---|---|---|
| AVIA 416 | Aviation Sustainability | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| BIOL 462 | Applied Wetland Science | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| EARTH 444 | Applied Wetland Science | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| GDS 270 | Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| GEOG 207 | Climate Change Fundamentals | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

## Programs & Plans Proposals

**Programs & Plans Proposal Details**

**Programs & Plans: Retire No proposals have been added.**

**Programs & Plans: Major Modifications No proposals have been added.**

**Programs & Plans: Minor Modifications No proposals have been added.**

## Regulations Proposals

**Regulations Proposal Details**

**Regulations: Retire No proposals have been added.**

**Regulations: New No proposals have been added.**

**Regulations: Changes No proposals have been added.**

# GEOG 416 - Aviation Sustainability

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
1

## Proposal Details

**Proposal Type**
Retire,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**
Winter 2025

**Retired Impact**
Yes,

**Retired Impact Details**
No impact as AVIA416 will remain on the books, and students will still be able to enroll in that course.

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

Retiring course as cross-listing with AVIA416 is no longer required. Major average calculations for students in GEM plans, will now include AVIA labelled courses.

Related agenda proposals:

- Diploma in Sustainability
- G-Aviation Specializations
- GEM-Aviation Specializations
- CEC-Aviation Specializations
- AVIA416

**Consultations**

No consultations required. Science will approve the removal of this course as the cross-listed course with AVIA416, through their approval pathway.

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Subject Code**
GEOG

**Number**
416

**Course Level**
400

**Title**
Aviation Sustainability

**Abbreviated Title**
Aviation Sustainability

**Undergraduate Communication Requirement Identifier**
No,

**Description**
An exploration of how sustainability is sought within the international aviation industry. The course takes a cross-sectional approach to aviation, exploring sustainability within the various sectors that make up the air transport system (e.g., air law, aircraft, operations, navigation, airports, and safety). Both the positive and negative impacts of aviation upon the sustainable development goals will be analyzed through reviewing case studies and industry practices. This course includes significant student project teamwork.

**Units**
1.00

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
ProjectSeminar

**Primary Component**
Seminar

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
Yes,

**Cross-Listed Courses**

AVIA 416 - Aviation Sustainability

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Must have completed the following:
  - AVIA100 - Introduction to Aviation (0.50)
- Students must be in level 2A or higher

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment

## Dependencies

**Course Requirements (units)**

- Sustainability Diploma - Diploma in Sustainability — View Program
- G-Aviation Specialization - Aviation Specialization — View Program
- CEC-Aviation Specialization - Aviation Specialization — View Program
- GEM-Aviation Specialization - Aviation Specialization — View Program

# AVIA 370 - Aviation Meteorology

Top

## Effective Date & Career

| Career | Effective Term and Year | Offering Number |
| --- | --- | --- |
| Undergraduate, | Fall 2026 | |

## Proposal Details

| Proposal Type | Academic Unit Approval |
| --- | --- |
| New, | 2025-09-24 |

| Last Offering of Course | Retired Impact | Retired Impact Details |
| --- | --- | --- |
| | | |

| Unit Weight/Number Changes | High Impact Changes - Please Read |
| --- | --- |
| | |

**Rationale for New Course**

This new course is currently a special topics offering through AVIA374 in the Winter of 2026. Formalizing the course by assigning AVIA370. Aviation students will greatly benefit from more practical knowledge of the atmosphere and experience in how weather forecasting is conducted to improve their in-flight skills as pilots as well as skills more broadly within the aviation industry. This is particularly prescient with the rise of turbulence-related flight incidents globally in the past few years and the increasing shifts in frequency and intensity of weather phenomena that are being documented year after year in Canada and beyond.

This course is intended to replace the outgoing GEOG309.

AVIA370 will also be listed as an elective in the aviation specialization in GEM as well as in the Faculty of Science's forthcoming Aviation Minor. All students in the aviation academic plans will be able to take the course as one of their electives.

Related ENV agenda proposals:

- CEC-Aviation specialization
- G-Aviation specialization
- GEM-Aviation specialization
- G-Climate Change Specialization
- GA-Climate Change Specialization
- GEM-Climate Change Specialization
- GEOG309

**Rationale for Change**

**Consultations**

Students were engaged and consulted in the offering of Aviation Meteorology as a special topics course. Creating a course code for this offering will allow the formalization of the topic with it's own course code. The Faculty of Science and the Geography Environmental Management department in the Faculty of Environment was consulted.

Draft AVIA 370 outline based off upcoming winter 2026 AVIA 374 topic course is attached.

**Supporting Documentation**

- draft_courseoutline_AVIA374_001_AviationMet.pdf

## Course Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Subject Code**
AVIA

**Number**
370

**Course Level**
300

**Title**
Aviation Meteorology

**Abbreviated Title**
Aviation Meteorology

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This course will instruct students in the principles of meteorology, focusing on the importance of meteorology to the aviation industry. Students will develop a deeper, applied understanding of the atmosphere, how to interpret meteorological data and conditions, and will be able to construct their own weather forecasts for aviation purposes.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**

**Primary Component**

| | |
|---|---|
| LectureTutorial | Lecture |

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
No,

**Cross-Listed Courses**

## Repeatable Courses

| Can this course be repeated for credit? | Total Completions Allowed | Allow Multiple Enrol in a Term |
|---|---|---|
| No, | | |

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete 1 of the following

- Must have completed the following:
  - GEOG209 - Hydroclimatology (0.50)
- Complete all of the following
  - Students must be in level 3A or higher
  - Enrolled in H-Geography & Aviation, or H-Science & Aviation

**Corequisites**

No Rules

**Antirequisites**

Not completed nor enrolled in: AVIA374 (Topic 6: Aviation Meteorology)

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment | Faculty of Science

## Dependencies

There are no dependencies

# AVIA 470 - Airline Planning and Management

Top

## Effective Date & Career

| Career | Effective Term and Year | Offering Number |
|---|---|---|
| Undergraduate, | Fall 2026 | |

## Proposal Details

| Proposal Type | Academic Unit Approval |
|---|---|
| New, | 2025-09-24 |

| Last Offering of Course | Retired Impact | Retired Impact Details |
|---|---|---|
| | | |

| Unit Weight/Number Changes | High Impact Changes - Please Read |
|---|---|
| | |

**Rationale for New Course**

This new course is currently a special topics offering through AVIA474 in the Fall of 2025. Formalizing the course by assigning AVIA470. Students demonstrated much interest in taking this new offering, the course reserves being filled almost immediately once offered.

AVIA470 will also be listed as an elective in the aviation specialization in GEM as well as in the Faculty of Science's forthcoming Aviation Minor. All students in the aviation academic plans will be able to take the course as one of their electives.

Related ENV agenda proposals:

- CEC-Aviation specializations
- G-Aviation specializations
- GEM-Aviation specializations

**Rationale for Change**

**Consultations**

Students were engaged and consulted in the offering of Airline Planning and Management as a special topics course. Creating a course code for this offering will allow the formalization of the topic with it's own course code. The Faculty of Science and the Geography Environmental Management department in the Faculty of Environment was consulted.

Draft AVIA 470 outline based off of fall 2025 AVIA 474 topic course is attached.

**Supporting Documentation**

- Fall 2025_ Special Topics in Aviation (002).pdf

## Course Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Subject Code**
AVIA

**Number**
470

**Course Level**
400

**Title**
Airline Planning and Management

**Abbreviated Title**
Airline Planning & Management

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This course introduces students to the principles and practices of planning and scheduling in airline operations. It covers strategic, tactical, and operational planning, schedule development, flight planning, crew and aircraft scheduling, and disruption management. All of these topics are examined within the context of real-world constraints and industry standards. The course emphasizes operational efficiency, safety, sustainability, and the critical role of planning in delivering reliable air transport services.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**

**Primary Component**

| | |
|---|---|
| LectureTutorial | Lecture |

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
No,

**Cross-Listed Courses**

## Repeatable Courses

| Can this course be repeated for credit? | Total Completions Allowed | Allow Multiple Enrol in a Term |
|---|---|---|
| No, | | |

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Must have completed the following:

- AVIA100 - Introduction to Aviation (0.50)

**Corequisites**

No Rules

**Antirequisites**

Not completed nor enrolled in: AVIA474 (Topic 1: Airline Planning and Scheduling)

## Course Notes

**Fee Statement**
This course may have additional fees. See academic unit for details.

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment | Faculty of Science

## Dependencies

There are no dependencies

# GEOG 402 - Applied Wetland Science

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

**Offering Number**

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

After an extensive curriculum review, we are proposing changes to many of our core courses to streamline and scaffold learning throughout our course offerings. We are also aiming to reduce redundancies across course offerings and explore opportunities to collaborate with other units. Since Earth Sciences and Biology offer a popular Wetlands course (EARTH 444 cross-listed with BIOL 462) which are already anti-requisites to GEOG405, we propose to retire GEOG405, and cross-list this new course (GEOG402) with those two Science courses.

Related proposals:

- BIOL462
- EARTH 444

**Rationale for Change**

**Consultations**

Consultations with Earth Sciences and Biology.

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Subject Code**
GEOG

**Number**
402

**Course Level**
400

**Title**
Applied Wetland Science

**Abbreviated Title**
Applied Wetland Science

**Undergraduate Communication Requirement Identifier**
No,

**Description**
Advanced concepts on wetland ecosystems in the context of regional and global earth systems processes such as carbon and nitrogen cycling and climate change, applications of wetland paleoecology, use of isotopes and other geochemical tools in wetland science, and wetland engineering in landscape rehabilitation and ecotechnology. Current issues in Canada and abroad will be examined.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
LectureTutorial

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
Yes,

**Cross-Listed Courses**

BIOL 462 - Applied Wetland Science | EARTH 444 - Applied Wetland Science

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Must have completed at least 1 of the following:

- BIOL350 - Ecosystem Ecology (0.50)
- BIOL351 - Aquatic Ecology (0.50)
- EARTH221 - Introductory Geochemistry (0.50)
- EARTH322 - Ecohydrology (0.50)
- EARTH358 - Earth System Science (0.50)
- ENVE375 - Physico-Chemical Processes (0.50)
- ENVE376 - Biological Processes (0.50)
- GEOG303 - Physical Hydrology (0.50)
- GEOG304 - Carbon in the Biosphere (0.50)

**Corequisites**

No Rules

**Antirequisites**

Not completed nor enrolled in: GEOG405

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment | Faculty of Science

## Dependencies

There are no dependencies

# SCI 205 - Climate Change Fundamentals

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

**Offering Number**

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-07-31

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

The current SCI 201, Global Warming and Climate Change, exists as an elective in Science, with good uptake, but high withdrawal rates. The current description sounds like the current GEOG 207, but a

substantial quantitative content is delivered, which may contribute to the high attrition, as students are not expecting it based on the course description.

There is relatively little overlap between these two courses and students who struggle in SCI 201, have much higher likelihood of success in GEOG 207. Since there is a known issue with student success in SCI 201, moving it to a third year, 300-level course (EARTH 305) and cross-listing a new SCI course, SCI 205, with the existing GEOG 207, will allow the new cross-listing to count toward science units, while providing students the content that the current SCI 201 course description promises. At the same time, the content of what is currently taught as SCI 201, will provide students in both faculties a dedicated climate change course, that builds on the SCI 205 cross-listing with GEOG 207, hopefully increasing the intake and addressing attrition.

The renumbered EARTH 305 will require either SCI 205/GEOG 207 or "level at least 2A Science" as a prerequisite, preparing students for the quantitative content of EARTH 305.

Related proposals:

- Science agenda: SCI201 renumbered as EARTH305
- Science and ENV agenda: GEOG207

**Rationale for Change**

**Consultations**

Consultations have occurred and this new SCI cross-listing for GEOG 207 (SCI 205) plus the level and number change for existing SCI 201 (EARTH 305) was agreed to by both faculties. A summary of this collaboration was detailed in an April 16, 2025 email (J. Wandel, GEM chair, D. Scott, L. Deakin).

A notification of pending changes was sent to Math, Engineering and Environment (email from M. Sertic dated Aug 5, 2025) as SCI 201 is listed as one choice in a list of options in Software Engineering elective lists and in two diplomas offered through the Faculty of Environment. Notification updated Oct 27th, as SCI 305 will now be EARTH 305, and the prerequisite plan for this course, also changed Prereq for EARTH 305: SCI 205/GEOG 205 or level at least 2B (*versus* "or MATH 127").

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Science

**Academic Unit**

Dean of Science Office

**Subject Code** **Number** **Course Level**

| | | |
|---|---|---|
| SCI | 205 | 200 |

**Title**
Climate Change Fundamentals

**Abbreviated Title**
Climate Change Fundamentals

**Undergraduate Communication Requirement Identifier**
No,

**Description**
Climate change is one of the most profound environmental and social issues affecting communities, nations and individuals. This course is an introduction to this global challenge, including its scientific underpinnings, history, potential impacts on natural systems and human societies around the world, and two societal responses: adaptation and greenhouse gas mitigation. Opportunities to develop sustainable resilient communities, as well as Canadian climate change policy responses, will be highlighted.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Lecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
Yes,

**Cross-Listed Courses**

GEOG 207 - Climate Change Fundamentals

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

No Rules

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

**Fee Statement**
This course may have additional fees. See academic unit for details.

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Science | Faculty of Environment

## Dependencies

There are no dependencies

# AVIA 210 - Human Factors in Aviation

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2023

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

Feedback from students in the aviation academic plans included learning about safety concepts earlier in the program, and not later near the end of their flight training and program. Offering this course a year earlier will introduce safety concepts and other human factors earlier in the program where it is more timely and relevant. This change is also in conjunction with moving AVIA417 into third year as AVIA317 Aviation Safety. Offering these two courses a year earlier will also have it so there is an UWaterloo AVIA course for each year of their respective academic plans and make room for additional AVIA courses being created for 3rd and 4th year.

Change to Prerequisite removing the level of study a student must be in. The prereq of AVIA 100 will remain.

Addition of the old number AVIA310 to the antirequisits.

The course number change will automatically be updated for the following academic plans, once approved through the governance pathway:

- Science and Aviation
- Geography and Aviation
- CEC-Aviation Specialization
- G-Aviation Specialization
- GEM-Aviation Specialization
- GEOG417 - prerequisite

**Consultations**

Students were engaged and consulted in the change as well as the instructor of the course. The Faculty of Science and the Geography Environmental Management department in the Faculty of Environment was consulted.

**Supporting Documentation**

## Course Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Subject Code**
AVIA

| Proposed |
| --- |
| **Number**<br>210 |
| Existing |
| **Number**<br>310 |

| Proposed |
| --- |
| **Course Level**<br>200 |
| Existing |
| **Course Level**<br>300 |

**Title**
Human Factors in Aviation

**Abbreviated Title**
Human Factors in Aviation

**Undergraduate Communication Requirement Identifier**
No,

**Description**
An exploration of aviation non-technical skills and their impact on aviation safety and operational performance. Components explore workload, management, situational awareness, decision-making, and crew co-ordination.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

| Proposed |
| --- |
| **Components**<br>Lecture |
| Existing |
| **Components**<br>Laboratory |

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
No,

**Cross-Listed Courses**

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

1. Must have completed the following:
    - AVIA100 - Introduction to Aviation (0.50)
    -
    - ~~Students must be in level 2A or higher~~

**Corequisites**

No Rules

**Antirequisites**

1. No Rules

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment | Faculty of Science

## Dependencies

**Prerequisites**

- AVIA 417 - Aviation Safety View Program

**Antirequisites**

- SYDE 543 - Cognitive Ergonomics View Program

**Course Requirements (no units)**

- H-Science & Aviation - Science and Aviation (Bachelor of Science - Honours) View Program

**Course Requirements (units)**

- H-Geography & Aviation - Geography and Aviation (Bachelor of Environmental Studies - Honours) View Program
- G-Aviation Specialization - Aviation Specialization View Program
- CEC-Aviation Specialization - Aviation Specialization View Program

- GEM-Aviation Specialization - Aviation Specialization View Program

# AVIA 270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
2

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

GEOG 270, which is cross-listed with AVIA270, is a core course in our 'Geomatics' stream of courses. We are proposing to change the name of the Geomatics program to 'Geospatial Data Science', with the creation of corresponding course codes (GDS) to support this name and reflect the nature of the GDS courses.

The term Geomatics has a professional identity that is very strongly tied to surveying and traditionally, therefore, to civil engineering. When the Geomatics program was launched at the University of Waterloo, much of the surveying tradition was to be found in civil and environmental engineering department. However, while limited expertise in Geography connected with surveying, historically, since 2005, the dominant identity of the Geomatics plan has reflected the strong and deep expertise of geographical information systems, remote sensing and spatial analysis, with less emphasis on surveying. Over time, the applied GIS and remote sensing technologies have strengthened, and while surveying remains a part of the plan, the dominant interest amongst students and faculty within the Geomatics plan is in the geospatial data science aspects (GIS, remote sensing and geospatial analysis). These are the dominant elements for which our program and graduates are known for, and creates the core of our disciplinary identity.

High school students are aware of data science as a recognizable and viable career path especially with a dominance in AI applications. At Waterloo, the re-branding of geomatics to geospatial data science, which corresponding course codes, better reflects what is actually taught in our program, and is a description that will better connect with potential students from a recruitment perspective. Geospatial data science explicitly deals with the acquisition and analysis of geospatial data and its adoption for environmental, policy and planning applications. For several years now, our introductory course for Geomatics students has been named ‘Geospatial Data Science’, as an attempt to better communicate to our entering class, the specifics of the plan they are embarking on. Changing the degree name, therefore, to Geospatial Data Science will:

- Better reflect the nature of our teaching and learning expertise in GEM (GIS, remote sensing, geospatial analysis, environmental and policy applications)
- Better resonate with high school students who are interested in the environment applications of geospatial data science
- Better serve students by incorporating professor's research applications into lesson planning. (modified)
- Better prepare students for the co-op positions, so potential employers have a clear sense of the training the student has received.
- Enable us to better leverage our research applications into teaching
- Maintain a strong link which students can leverage through co-op and at post-graduation

For the cross-listed course to be updated, to GDS, there needs to be a panel for this course effective dated 2026 to align these changes.

AVIA270 cross-list will automatically be updated upon approval of the new subject code by SUC, for GEOG270 (GDS270).

Related agenda proposals:

- GEOG270

**Consultations**

Consultation through the process for the introduction of a new subject code.

**Supporting Documentation**

## Course Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Subject Code**
AVIA

**Number**
270

**Course Level**
200

**Title**
Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements

**Abbreviated Title**
Remote Piloted Aircraft (RPAS)

**Undergraduate Communication Requirement Identifier**
No,

**Description**
Students will gain knowledge about the requirements and constraints affecting recreational, commercial and research RPAS (Unmanned Aerial Vehicles [UAV], Unmanned Aircraft Systems [UAS]) flights for geomatics applications. Theory and conceptual factors affecting flight, remote sensing, and spatial analysis with very-high resolution data will be discussed. Students will gain knowledge about how to navigate regulatory requirements. They will learn how to link their science and research objectives with geomatics skills to mitigate risk and obtain regulatory approval for legal RPAS flights. Assignments provide a range of experiences to students that may include: applied aspects of flight campaign approval, setup, management; flight training; and integrating imagery with geographic information systems.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
LaboratoryLecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
Yes,

**Cross-Listed Courses**

GEOG 270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

No Rules

**Corequisites**

No Rules

**Antirequisites**

1. Not completed nor currently enrolled in: GEOG270

## Course Notes

**Fee Statement**

This course may have additional fees. See academic unit for details.

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment | Faculty of Science

## Dependencies

**Course Requirements (units)**

- G-Aviation Specialization - Aviation Specialization — View Program
- CEC-Aviation Specialization - Aviation Specialization — View Program

**Course Requirements (no units)**

- CEC-Geomatics Specialization - Geomatics Specialization — View Program

**Course Requirements (units)**

- GEM-Aviation Specialization - Aviation Specialization — View Program

**Course Requirements (no units)**

- GEM-Geomatics Specialization - Geomatics Specialization — View Program
- GA-Geomatics Specialization - Geomatics Specialization — View Program

# AVIA 317 - Aviation Safety

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Offering Number**
1

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2024

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

Feedback from students in the aviation academic plans included learning about safety concepts earlier in the program, and not later near the end of their flight training and program. Offering this course a year earlier will build upon safety concepts and other human factors from earlier in the program. Placing the course in 3rd year is more timely and relevant with their flight training. This change is also in conjunction with moving AVIA310 into second year as AVIA210 Human Factors. Offering these two courses a year earlier will also have it so there is an UWaterloo AVIA course for each year of their respective academic plans and make room for additional AVIA courses currently being created for 3rd and 4th year.

Removing the pre-req of having to be enrolled in H-Geography & Aviation and H-Science & Aviation to make accessible for GEM Aviation Specialization and upcoming Science Aviation Minor. The prereq AVIA310, will be updated to AVIA210 upon SUC approval of the renumbering of AVIA310.

Original course AVIA417 added as an antirequisite.

The course number change will automatically be updated for the following academic plans, once approved through the governance pathway:

- Science and Aviation
- Geography and Aviation

Related Environment proposals:

- CEC-Aviation Specialization
- G-Aviation Specialization
- GEM-Aviation Specialization

**Consultations**

Students were engaged and consulted in the change as well as the instructor of the course. The Faculty of Science and the Geography Environmental Management department in the Faculty of Environment was also consulted.

**Supporting Documentation**

## Course Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Subject Code**
AVIA

| Proposed |
| --- |
| **Number**<br>317 |
| Existing |
| **Number**<br>417 |

| Proposed |
| --- |
| **Course Level**<br>300 |
| Existing |
| **Course Level**<br>400 |

**Title**
Aviation Safety

**Abbreviated Title**
Aviation Safety

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This course is an advanced exploration of how aviation safety is managed at the organizational level. Content will include explorations of pilot threat and error management, safety management systems (including risk analysis and hazard identification), and safety audits. The focal point of the course is on understanding the nature and causation of accidents. This course includes significant student project teamwork.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

| Proposed |
| --- |
| **Components**<br>Lecture |
| Existing |
| **Components**<br>Project |

| Proposed |
| --- |
| **Primary Component**<br>Lecture |
| Existing |
| **Primary Component**<br>Seminar |

## Grading Information

**Standard Course Grading**

**Special Course Grading**

Yes,

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
No,

**Cross-Listed Courses**

## Repeatable Courses

| Can this course be repeated for credit? | Total Completions Allowed | Allow Multiple Enrol in a Term |
|---|---|---|
| No, | | |

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

1. Must have completed the following:
   - AVIA310 - Human Factors in Aviation (0.50)
   -
   - ~~Enrolled in H-Geography & Aviation, or H-Science & Aviation~~

**Corequisites**

No Rules

**Antirequisites**

1. Not completed nor currently enrolled in: AVIA417

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment | Faculty of Science

## Dependencies

**Course Requirements (no units)**

- H-Science & Aviation - Science and Aviation (Bachelor of Science - Honours) View Program

**Course Requirements (units)**

- H-Geography & Aviation - Geography and Aviation (Bachelor of Environmental Studies - Honours) View Program

# AVIA 416 - Aviation Sustainability

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Offering Number**
2

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

Changing this course from 1.0 unit to 0.5 unit. Course was originally intended as a capstone course, however this did not come to pass. Reducing unit weight will reflect the nature of the course. Lowering the unit count will also make this course more accessible for those students pursuing an aviation specialization in GEM, Science & Aviation students due to their lower elective counts, as well as the forthcoming Faculty of Science Aviation Minor.

Retiring GEOG 416 course as cross-listing with AVIA416 is no longer required. Major average calculations for students in GEM plans, will now include AVIA labelled courses.

The component changes better reflect how the course is taught.

This course is included in the Diploma of Sustainability. The weight of the course will be updated once approved by SUC.

Related ENV proposals:

- Diploma in Sustainability
- CEC-Aviation Specialization

- G-Aviation Specialization
- GEM-Aviation Specialization

**Consultations**

Students were engaged and consulted in the change as well as the instructor of the course. The Faculty of Science and the Geography Environmental Management department in the Faculty of Environment was consulted.

**Supporting Documentation**

## Course Information

**Faculty**

Vice-President Academic Office

**Academic Unit**

Interdisciplinary Studies

**Subject Code**
AVIA

**Number**
416

**Course Level**
400

**Title**
Aviation Sustainability

**Abbreviated Title**
Aviation Sustainability

**Undergraduate Communication Requirement Identifier**
No,

**Description**
An exploration of how sustainability is sought within the international aviation industry. The course takes a cross-sectional approach to aviation, exploring sustainability within the various sectors that make up the air transport system (e.g., air law, aircraft, operations, navigation, airports, and safety). Both the positive and negative impacts of aviation upon the sustainable development goals will be analyzed through reviewing case studies and industry practices. This course includes significant student project teamwork.

| Proposed |
| --- |
| **Units**<br>0.50 |
| Existing |
| **Units** |

**Exceptions to Fees or Academic Progress Units**
No,

1.00

| Proposed |
| --- |
| **Components**<br>Lecture |
| Existing |
| **Components**<br>Project |

| Proposed |
| --- |
| **Primary Component**<br>Lecture |
| Existing |
| **Primary Component**<br>Seminar |

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

| Proposed |
| --- |
| **Is this course cross-listed?**<br>No, |
| Existing |
| **Is this course cross-listed?**<br>Yes, |

| Proposed |
| --- |
| **Is this course cross-listed?**<br>No, |
| Existing |

**Is this course cross-listed?**
Yes,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Must have completed the following:
  - AVIA100 - Introduction to Aviation (0.50)
- Students must be in level 2A or higher

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment | Faculty of Science

## Dependencies

**Course Requirements (units)**

- Sustainability Diploma - Diploma in Sustainability — View Program
- G-Aviation Specialization - Aviation Specialization — View Program
- CEC-Aviation Specialization - Aviation Specialization — View Program
- GEM-Aviation Specialization - Aviation Specialization — View Program

# BIOL 462 - Applied Wetland Science

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2024

**Offering Number**
2

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

After an extensive curriculum review in the Faculty of Environment, Geography proposed that GEOG402, Wetlands, Applied Wetlands, become the third cross-listed course.

Listing these three courses as cross-listed reduces the redundancy in course offerings, and explores opportunities to collaborate with other units.

GEOG402 is replacing GEOG405, which is an antirequisite of EARTH444 and BIOL462.

Related agenda proposals:

- BIOL462
- GEOG402
- GEOG405

**Note: pending Biology department approval**

**Consultations**

Consultations with Geography and EARTH have taken place (J. Johnston Sept. 16, 2025)

Consultations with Biology and EARTH have taken place (M. Pinheiro Oct. 08, 2025)

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Science

**Academic Unit**

Department of Biology

**Subject Code**
BIOL

**Number**
462

**Course Level**
400

**Title**
Applied Wetland Science

**Abbreviated Title**
Applied Wetland Science

**Undergraduate Communication Requirement Identifier**
No,

**Description**
Advanced concepts on wetland ecosystems in the context of regional and global earth systems processes such as carbon and nitrogen cycling and climate change, applications of wetland paleoecology, use of isotopes and other geochemical tools in wetland science, and wetland engineering in landscape rehabilitation and ecotechnology. Current issues in Canada and abroad will be examined.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
LectureTutorial

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**

Yes,

Proposed

**Cross-Listed Courses**

GEOG 402 - Applied Wetland Science

Existing

**Cross-Listed Courses**

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Must have completed at least 1 of the following:

- BIOL350 - Ecosystem Ecology (0.50)
- BIOL351 - Aquatic Ecology (0.50)
- EARTH221 - Introductory Geochemistry (0.50)
- EARTH322 - Ecohydrology (0.50)
- EARTH358 - Earth System Science (0.50)
- ENVE375 - Physico-Chemical Processes (0.50)
- ENVE376 - Biological Processes (0.50)

**Corequisites**

No Rules

**Antirequisites**

Not completed nor concurrently enrolled in:

- GEOG405 - Wetlands (1.00)

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment | Faculty of Science

## Dependencies

**Course Requirements (no units)**

- Life Sciences Option - Life Sciences Option View Program
- CIVE-Water Resources Specialization - Water Resources Specialization View Program
- H-Environmental Sciences - Geoscience Specialization - Environmental Sciences - Geoscience Specialization (Bachelor of Science - Honours) View Program

**Course Requirements (units)**

- H-Environmental Sciences - Water Science Specialization - Environmental Sciences - Water Science Specialization (Bachelor of Science - Honours) View Program

**Course Lists**

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours)
- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) View Program View Program
- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours) View Program

**Course Requirements (no units)**

- Pollution & Restoration Specialization - Pollution and Restoration Specialization
- ENVE-Water Resources Specialization - Water Resources Specialization View Program

- Earth & Water Science Specialization - Earth and Water Science Specialization — View Program
  View Program

**Course Requirements (units)**

- Ecology & Environmental Biology Option - Ecology and Environmental Biology Option
- H-Environmental Sciences - Ecology Specialization - Environmental Sciences - Ecology Specialization (Bachelor of Science - Honours) — View Program
  View Program

**Course Requirements (no units)**

- Hydrogeology Specialization - Hydrogeology Specialization — View Program
- Physical Sciences Option - Physical Sciences Option — View Program

# EARTH 444 - Applied Wetland Science

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2024

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

After an extensive curriculum review in the Faculty of Environment, Geography proposed that GEOG402, Wetlands, Applied Wetlands, become the third cross-listed course.

Listing these three courses as cross-listed reduces the redundancy in course offerings, and explores opportunities to collaborate with other units.

GEOG402 is replacing GEOG405, which is an antirequisite of EARTH444 and BIOL462.

Related agenda proposals:

- BIOL462
- GEOG402
- GEOG405

**Note: pending Biology department approval**

**Consultations**

Consultations with Geography have taken place (email J. Johnston Sept. 16)

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Science

**Academic Unit**

Department of Earth and Environmental Sciences

**Subject Code**
EARTH

**Number**
444

**Course Level**
400

**Title**
Applied Wetland Science

**Abbreviated Title**

**Undergraduate Communication**

Applied Wetland Science

**Requirement Identifier**
No,

**Description**
Advanced concepts on wetland ecosystems in the context of regional and global earth systems processes such as carbon and nitrogen cycling and climate change, applications of wetland paleoecology, use of isotopes and other geochemical tools in wetland science, and wetland engineering in landscape rehabilitation and ecotechnology. Current issues in Canada and abroad will be examined.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
LectureTutorial

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**
Yes,

Proposed

**Cross-Listed Courses**

GEOG 402 - Applied Wetland Science

Existing

**Cross-Listed Courses**

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Must have completed at least 1 of the following:

- BIOL350 - Ecosystem Ecology (0.50)
- BIOL351 - Aquatic Ecology (0.50)
- EARTH221 - Introductory Geochemistry (0.50)
- EARTH322 - Ecohydrology (0.50)
- EARTH358 - Earth System Science (0.50)
- ENVE375 - Physico-Chemical Processes (0.50)
- ENVE376 - Biological Processes (0.50)

**Corequisites**

No Rules

**Antirequisites**

Not completed nor concurrently enrolled in:

- GEOG405 - Wetlands (1.00)

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Science | Faculty of Environment

## Dependencies

**Course Requirements (no units)**

- Life Sciences Option - Life Sciences Option View Program
- CIVE-Water Resources Specialization - Water Resources Specialization View Program
- H-Environmental Sciences - Geoscience Specialization - Environmental Sciences - Geoscience Specialization (Bachelor of Science - Honours) View Program

**Course Requirements (units)**

- H-Environmental Sciences - Water Science Specialization - Environmental Sciences - Water Science Specialization (Bachelor of Science - Honours) View Program

**Course Lists**

- H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours)
- H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours) View Program View Program
- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours) View Program

**Course Requirements (no units)**

- Pollution & Restoration Specialization - Pollution and Restoration Specialization
- ENVE-Water Resources Specialization - Water Resources Specialization View Program
- Earth & Water Science Specialization - Earth and Water Science Specialization View Program View Program

**Course Requirements (units)**

- Ecology & Environmental Biology Option - Ecology and Environmental Biology Option View Program

**Course Requirements (no units)**

- Hydrogeology Specialization - Hydrogeology Specialization View Program
- Physical Sciences Option - Physical Sciences Option View Program

# GDS 270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements

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## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

GEOG 270 is a core course in our 'Geomatics' stream of courses. We are proposing to change the name of the Geomatics program to 'Geospatial Data Science', with the creation of corresponding course codes (GDS) to support this name and reflect the nature of the GDS courses.

The term Geomatics has a professional identity that is very strongly tied to surveying and traditionally, therefore, to civil engineering. When the Geomatics program was launched at the University of Waterloo, much of the surveying tradition was to be found in civil and environmental engineering department. However, while limited expertise in Geography connected with surveying, historically, since 2005, the dominant identity of the Geomatics plan has reflected the strong and deep expertise of

geographical information systems, remote sensing and spatial analysis, with less emphasis on surveying. Over time, the applied GIS and remote sensing technologies have strengthened, and while surveying remains a part of the plan, the dominant interest amongst students and faculty within the Geomatics plan is in the geospatial data science aspects (GIS, remote sensing and geospatial analysis). These are the dominant elements for which our program and graduates are known for, and creates the core of our disciplinary identity.

High school students are aware of data science as a recognizable and viable career path especially with a dominance in AI applications. At Waterloo, the re-branding of geomatics to geospatial data science, which corresponding course codes, better reflects what is actually taught in our program, and is a description that will better connect with potential students from a recruitment perspective. Geospatial data science explicitly deals with the acquisition and analysis of geospatial data and its adoption for environmental, policy and planning applications. For several years now, our introductory course for Geomatics students has been named 'Geospatial Data Science', as an attempt to better communicate to our entering class, the specifics of the plan they are embarking on. Changing the degree name, therefore, to Geospatial Data Science will:

- Better reflect the nature of our teaching and learning expertise in GEM (GIS, remote sensing, geospatial analysis, environmental and policy applications)
- Better resonate with high school students who are interested in the environment applications of geospatial data science
- Better serve students by incorporating professor's research applications into lesson planning. (modified)
- Better prepare students for the co-op positions, so potential employers have a clear sense of the training the student has received.
- Enable us to better leverage our research applications into teaching
- Maintain a strong link which students can leverage through co-op and at post-graduation

AVIA270 cross list will automatically be updated upon approval of the new subject code by SUC.

**Consultations**

Consultation through the process for the introduction of a new subject code.

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

Proposed

**Subject Code**
GDS

**Number**
270

**Course Level**
200

Existing

**Subject Code**
GEOG

**Title**
Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements

**Abbreviated Title**
Remote Piloted Aircraft (RPAS)

**Undergraduate Communication Requirement Identifier**
No,

**Description**
Students will gain knowledge about the requirements and constraints affecting recreational, commercial and research RPAS (Unmanned Aerial Vehicles [UAV], Unmanned Aircraft Systems [UAS]) flights for geomatics applications. Theory and conceptual factors affecting flight, remote sensing, and spatial analysis with very-high resolution data will be discussed. Students will gain knowledge about how to navigate regulatory requirements. They will learn how to link their science and research objectives with geomatics skills to mitigate risk and obtain regulatory approval for legal RPAS flights. Assignments provide a range of experiences to students that may include: applied aspects of flight campaign approval, setup, management; flight training; and integrating imagery with geographic information systems.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
LaboratoryLecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

**Is this course cross-listed?**

Yes,

**Cross-Listed Courses**

AVIA 270 - Remotely Piloted Aircraft Systems (RPAS) Knowledge Requirements

## Repeatable Courses

**Can this course be repeated for credit?**
No,

**Total Completions Allowed**

**Allow Multiple Enrol in a Term**

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

No Rules

**Corequisites**

No Rules

**Antirequisites**

1. Not completed nor currently enrolled in: GEOG270

## Course Notes

**Fee Statement**
This course may have additional fees. See academic unit for details.

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Environment | Faculty of Science

## Dependencies

**Course Requirements (units)**

- G-Aviation Specialization - Aviation Specialization — View Program
- CEC-Aviation Specialization - Aviation Specialization — View Program

**Course Requirements (no units)**

- CEC-Geomatics Specialization - Geomatics Specialization — View Program

**Course Requirements (units)**

- GEM-Aviation Specialization - Aviation Specialization — View Program

**Course Requirements (no units)**

- GEM-Geomatics Specialization - Geomatics Specialization — View Program
- GA-Geomatics Specialization - Geomatics Specialization — View Program

# GEOG 207 - Climate Change Fundamentals

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Last Offering of Course**

**Retired Impact**

**Retired Impact Details**

**Unit Weight/Number Changes**

**High Impact Changes - Please Read**

**Rationale for New Course**

**Rationale for Change**

As part of ongoing collaborations with the Faculty of Science, we are cross-listing GEOG 207 with SCI 205. This will allow Science students to take GEOG 207/SCI 205 and ensure it counts towards their degree requirements. GEOG 207/SCI205 will also become a pre-req to the new SCI 305 course.

All programs with GEOG 207 as a course requirement have been adjusted to reflect the new cross-listing.

Related agenda proposals: SCI205 added

- H-Geomatics
- JH-Geography and Environmental Managment
- H-Geography and Environmental Managment
- G-Geography and Environmental Managment
- Science, Technology, and Society Specialization
- H-Sustainability and Financial Management
- Diploma in Sustainability
- H-Climate and Environmental Change
- GEOG307
- GEOG314

- GEOG359
- GEOG417

**Consultations**

Consultations with Science occurred on multiple occasions.

**Supporting Documentation**

## Course Information

**Faculty**

Faculty of Environment

**Academic Unit**

Department of Geography and Environmental Management

**Subject Code**
GEOG

**Number**
207

**Course Level**
200

**Title**
Climate Change Fundamentals

**Abbreviated Title**
Climate Change Fundamentals

**Undergraduate Communication Requirement Identifier**
No,

**Description**
Climate change is one of the most profound environmental and social issues affecting communities, nations and individuals. This course is an introduction to this global challenge, including its scientific underpinnings, history, potential impacts on natural systems and human societies around the world, and two societal responses: adaptation and greenhouse gas mitigation. Opportunities to develop sustainable resilient communities, as well as Canadian climate change policy responses, will be highlighted.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**

**Primary Component**

| Lecture | Lecture |
| --- | --- |

## Grading Information

**Standard Course Grading**
Yes,

**Special Course Grading**

**Grading Basis**

## Cross-Listing Information

Proposed

**Is this course cross-listed?**
Yes,

Existing

**Is this course cross-listed?**
No,

Proposed

**Cross-Listed Courses**

SCI 205 - Climate Change Fundamentals

Existing

**Cross-Listed Courses**

## Repeatable Courses

| Can this course be repeated for credit? | Total Completions Allowed | Allow Multiple Enrol in a Term |
| --- | --- | --- |
| No, | | |

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

No Rules

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

**Fee Statement**

**Notes**

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment  Faculty of Science

## Dependencies

**Prerequisites**

- GEOG 314 - Climate Services View Program
- GEOG 359 - Low Carbon Transition View Program
- GEOG 417 - Climate Change Communication View Program
- GEOG 307 - Societal Adaptation to Climate Change View Program
- GEOG 320 - The Cryosphere View Program
- GEOG 414 - Climate Justice View Program

**Course Requirements (no units)**

- CS-Software Engineering Specialization - Software Engineering Specialization View Program

**Course Requirements (units)**

- H-Geography & Environmental Management - Geography and Environmental Management (Bachelor of Environmental Studies - Honours) View Program

**Course Requirements (no units)**

- H-Geomatics - Geomatics (Bachelor of Environmental Studies - Honours) View Program

**Course Requirements (units)**

- 3G-Geography & Environmental Management - Geography and Environmental Management (Bachelor of Environmental Studies - Three-Year General) View Program
- H-Sustainability & Financial Management - Sustainability and Financial Management (Bachelor of Sustainability and Financial Management - Honours) View Program
- Sustainability Diploma - Diploma in Sustainability View Program

**Course Lists**

- Peace & Conflict Studies Minor - Peace and Conflict Studies Minor View Program
- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours) View Program

**Course Requirements (no units)**

- JH-Geography & Environmental Management - Geography and Environmental Management (Joint Honours) View Program

**Course Requirements (units)**

- G-Aviation Specialization - Aviation Specialization View Program
- CEC-Aviation Specialization - Aviation Specialization View Program

**Course Requirements (no units)**

- G-Climate Change & Environment Specialization - Climate Change and Environment Specialization View Program

**Course Requirements (units)**

- GEM-Aviation Specialization - Aviation Specialization View Program

**Course Requirements (no units)**

- GA-Climate Change & Environment Specialization - Climate Change and Environment Specialization View Program
- GEM-Climate Change & Environment Specialization - Climate Change and Environment

Specialization View Program

**Course Lists**

- 4G-Peace & Conflict Studies - Peace and Conflict Studies (Bachelor of Arts - Four-Year General) View Program
- H-Peace & Conflict Studies - Peace and Conflict Studies (Bachelor of Arts - Honours)
- Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements View Program

View Program

**Course Requirements (units)**

- H-Climate & Environmental Change - Climate and Environmental Change (Bachelor of Sciences - Honours) View Program
- Climate & Sustainability Specialization - Climate and Sustainability Specialization
- Science, Technology, & Society Specialization - Science, Technology, and Society Specialization View Program

View Program

**Course Requirements (no units)**

- Energy & Climate Change Specialization - Energy and Climate Change Specialization

View Program

**Course Lists**

- 3G-Peace & Conflict Studies - Peace and Conflict Studies (Bachelor of Arts - Three-Year General) View Program

## Date 2026/01/23

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## Meeting Information

**Agenda Page TitleSUC - 2026-02 - Consent Agenda - Faculty of Health**

**Career Level**
Undergraduate,

**Faculty/UnitFaculty of Health**

**Date2026-02-04** **Time** **Location**

**Summary**

**Faculty of Health undergraduate curriculum changes for inclusion in the 2026-2027 Undergraduate Studies Academic Calendar**

**Undergraduate curriculum proposals from the Department of Kinesiology and Health Sciences, Department of Recreation and Leisure Studies, and the School of Public Health Sciences, to the Senate Undergraduate Council meeting of February 4, 2026.**

**Undergraduate report approval process for 2026-2027 Undergraduate Calendar ->**

**Admin Council (AC): October 15, 2025**

**Faculty Undergraduate Studies Committee (FUSC): November 4, 2025**

**Faculty Council (FC): November 28, 2025**

**SUC Curriculum Subcommittee: January 8 & 9, 2026**

**Senate Undergraduate Council: February 4, 2026**

**Other Business**

# Course Proposals

**Course Proposal Details**

## Courses: New (effective Fall 2026)

***Department of Kinesiology and Health Sciences***

**KIN 120: Add a new course, Problem-based quantitative analysis for Kinesiology.**

**KIN 300L: Add a new course, Anatomical Dissection Laboratory.**

***Department of Recreation and Leisure Studies***

**REC 300: Add a new course, Youth Development in Sport and Recreation.**

**REC 434: Add a new course, International Study Abroad in Sport Management.**

## Courses: Changes (effective Fall 2026)

***School of Public Health Sciences***

**HLTH 370 (Ecological Determinants of Health): Revise the course description to better reflect the topics and content of the course.**

***Department of Kinesiology and Health Sciences***

**KIN 121 (Biomechanics of Human Movement): Revise the course prerequisite to add KIN 120.**

**KIN 121L (Biomechanics of Human Movement Laboratory): Revise the course prerequisite to add KIN 120.**

**KIN 390 (Clinical Field Placement): Revise the course description and add Department Consent required.**

***Department of Recreation and Leisure Studies***

**REC 200 (Play, Creativity and Child Development): Revise the course title (Introduction to Children's Play), abbreviated title (Intro Children's Play), description, and remove prerequisite of PSYCH 101/PSYCH 101R.**

**REC 383 (Tourism Impacts - International Perspectives): Revise the course prerequisite to add GEOG 202. (Cross-listed with GEOG 323; owned by the Faculty of Environment.)**

**REC 413 (Innovative Solutions in Recreation and Sport Business): Revise the course title (Innovative Solutions in Sport and Recreation Management) and abbreviated title (Innov Soln: Sport & Rec Mgmt).**

**Courses: Retire No proposals have been added.**

**Courses: New**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| KIN 120 | Problem-based quantitative analysis for Kinesiology | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| KIN 300L | Anatomical Dissection Laboratory | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| REC 300 | Youth Development in Sport and Recreation | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| REC 434 | International Study Abroad in Sport Management | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

**Courses: Changes**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| HLTH 370 | Ecological Determinants of Health | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| KIN 121 | Biomechanics of Human Movement | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| KIN 121L | Biomechanics of Human Movement Laboratory | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| KIN 390 | Clinical Field Placement | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| REC 200 | Introduction to Children's Play | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| REC 383 | Tourism Impacts - International Perspectives | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| REC 413 | Innovative Solutions in Sport and Recreation Management | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

## Programs & Plans Proposals

**Programs & Plans Proposal Details**

### Programs & Plans: Minor Modifications (effective Fall 2026)

***Department of Kinesiology and Health Sciences***

**4G-Kinesiology, Kinesiology (Bachelor of Science - Four-Year General): Revise the Required Courses to add KIN 120 and remove MATH 124, MATH 127.**

**H-Kinesiology, Kinesiology (Bachelor of Science - Honours): Revise the Required Courses to add KIN 120 and remove MATH 124, MATH 127.**

**Programs & Plans: Retire No proposals have been added.**

**Programs & Plans: Major Modifications No proposals have been added.**

**Programs & Plans: Minor Modifications**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| 4G-Kinesiology | Kinesiology (Bachelor of Science - Four-Year General) | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| H-Kinesiology | Kinesiology (Bachelor of Science - Honours) | Programs | SUC Subcommittee, SUC Curricular Subcommittee |

## Regulations Proposals

**Regulations Proposal Details**

**Regulations: Retire No proposals have been added.**

**Regulations: New No proposals have been added.**

**Regulations: Changes No proposals have been added.**

# KIN 120 - Problem-based quantitative analysis for Kinesiology

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-09-24

**Rationale for New Course**

To add new course, KIN 120, Problem-based quantitative analysis for Kinesiology.

The Department of Kinesiology and Health Sciences will be adding new course, KIN 120, Problem-based quantitative analysis for Kinesiology, to the Kinesiology (Bachelor of Science - Four-Year General) and Kinesiology (Bachelor of Science - Honours) required course lists replacing MATH 124 (and MATH 127).

Moving the mathematics course into Kinesiology and Health Sciences, strengthens conceptual understanding and fosters continuity across the kinesiology curriculum, while embedding content in kinesiology-specific contexts. These connections transform abstract concepts into tools for solving real-world problems in human movement and performance. Integrating mathematics in this way will enhance student engagement and success through meaningful examples and applications that align with their academic and professional goals.

As a multidisciplinary department, Kinesiology and Health Sciences has identified various instructors with discipline-specific expertise that allows them to bridge theory and application effectively.

**Consultations**

The Associate Dean for Undergraduate Studies in the Faculty of Health informed the Associate Dean for Undergraduate Studies in the Faculty of Mathematics of Kinesiology and Health Sciences' (KHS) intention

to offer the introductory mathematics course in the BSc KIN program (currently MATH 124) within KHS to ensure that mathematical concepts are taught in ways that directly support kinesiology learning outcomes.

At the suggestion of the Associate Dean for Undergraduate Studies in the Faculty of Mathematics, the Department Chair and Associate Chair for Undergraduate Studies in Kinesiology and Health Sciences met with the Assistant Dean, Core and Service Teaching in the Faculty of Mathematics to discuss the proposal. During the meeting, it was clarified that the pedagogical concerns were not related to omissions in MATH 124 content, but rather to the discipline-specific knowledge required to effectively integrate foundational mathematics within the kinesiology curriculum.

## Course Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Kinesiology and Health Sciences

**Subject Code**
KIN

**Number**
120

**Course Level**
100

**Title**
Problem-based quantitative analysis for Kinesiology

**Abbreviated Title**
Qnt Analysis for Kinesiology

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This course uses a curated set of discipline-focused problems to introduce the mathematical tools and analytical techniques essential in assessing, enhancing and restoring human movement and performance. Drawing from algebra, trigonometry, geometry, vectors, and time series data analysis students will learn how to analyze discrete data streams to address integrative questions in biomechanics, neuroscience, physiology and nutrition. These quantitative competencies support upper-year coursework and professional preparation across the breadth of kinesiology.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
LectureTutorial

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- 4U Advanced Functions or 4U Calculus and Vectors
- Enrolled in 4G-Kinesiology, or H-Kinesiology

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Health

## Dependencies

There are no dependencies

# KIN 300L - Anatomical Dissection Laboratory

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-09-24

**Rationale for New Course**

To add a new course. In KIN 100 (Regional Human Anatomy) and KIN 100L (Regional Human Anatomy Laboratory), students learn the detailed anatomy of the limbs and trunk. These courses, along with KIN 301 (Human Anatomy of the Central Nervous System) and KIN 305 (Human Anatomy of the Thorax, Abdomen, and Pelvis), rely on pre-dissected cadavers prepared in advance to support lab-based learning. Each spring, a small group of dedicated undergraduate volunteers each spend up to 40 hours preparing these specimens. This work requires advanced anatomical knowledge beyond the scope of KIN 100/100L, as well as a high level of technical proficiency. The proposed course will provide a formal pathway for highly motivated students to gain this expertise. It will offer an intensive, small-group dissection experience that is currently unavailable to kinesiology undergraduates at any other institution in Canada.

## Course Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Kinesiology and Health Sciences

**Subject Code**
KIN

**Number**
300L

**Course Level**
300

**Title**
Anatomical Dissection Laboratory

**Abbreviated Title**
Anatomical Dissection Lab

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This laboratory offers students hands-on experience in cadaveric dissection. Building on foundational anatomical knowledge, students will prepare specimens for use in undergraduate anatomy teaching labs while refining technical skills and deepening their understanding of human structure through practical, supervised dissection experience.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**

**Primary Component**

| | |
|---|---|
| Laboratory | Laboratory |

## Grading Information

**Standard Course Grading**
No,

**Special Course Grading**
Credit/No Credit

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
Instructor consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Must have completed the following:
  - KIN100 - Regional Human Anatomy (0.50)
  - KIN100L - Regional Human Anatomy Laboratory (0.25)
- Students must be in level 3A or higher

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Health

## Dependencies

There are no dependencies

# REC 300 - Youth Development in Sport and Recreation

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-06-12

**Rationale for New Course**

This course has been delivered multiple times as REC 272, a special topics course (Special Topics in Leisure Studies 2), with strong enrollment each time. Many students in the Department of Recreation and Leisure Studies, as well as the University of Waterloo, have an interest in youth development and plan to pursue careers connected to youth (e.g., teaching, community programming, social work with families). This course offers students an opportunity to focus on youth development within the context of sport and recreation.

## Course Information

**Faculty**
Faculty of Health

**Academic Unit**
Department of Recreation and Leisure Studies

**Subject Code**
REC

**Number**
300

**Course Level**
300

**Title**
Youth Development in Sport and Recreation

**Abbreviated Title**
Youth Development

**Undergraduate Communication Requirement Identifier**
No,

**Description**

This course explores theories and practices of youth development in sport and recreation, emphasizing inclusive, developmentally appropriate, and evidence-based approaches. Students will critically examine program design, participation trends, and the broader social contexts that shape youth experiences in sport and recreation settings. Through interactive projects students will become meaningful leaders in the lives of youth.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Lecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Students must be in level 2A or higher

**Corequisites**

No Rules

**Antirequisites**

Not completed nor concurrently enrolled in: REC272 (Topic 3: Positive Youth Development)

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

There are no dependencies

# REC 434 - International Study Abroad in Sport Management

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-06-12

**Rationale for New Course**

This course has been delivered previously as REC 472, a special topics course (Special Topics in Recreation and Leisure Studies 4), and will be offered in alternating years moving forward, allowing students an experiential opportunity to learn about sport management within an international context.

## Course Information

**Faculty**
Faculty of Health

**Academic Unit**
Department of Recreation and Leisure Studies

**Subject Code**
REC

**Number**
434

**Course Level**
400

**Title**
International Study Abroad in Sport Management

**Abbreviated Title**
International Study Abroad

**Undergraduate Communication Requirement Identifier**
No,

**Description**

This advanced-level study abroad course offers a comprehensive examination of the dynamic field of international sport management. This course takes place in an international location which may vary in each course offering. Engaging lectures, interactive discussions, and the site visits/tours to prominent sport organizations and venues will provide students with first-hand insights into the global significance and rich cultural community development, and the socio-economic impacts of sport on global communities.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Field StudiesOnline

**Primary Component**
Field Studies

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
Department consent required,

**Consent to Drop**
Department consent required,

**Prerequisites**

Students must be in level 2B or higher

**Corequisites**

No Rules

**Antirequisites**

Not completed nor concurrently enrolled in: REC472 (Topic 1: International Study Abroad UK: Sport Management)

## Course Notes

**Fee Statement**
This course may have additional fees. See academic unit for details.

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

There are no dependencies

# HLTH 370 - Ecological Determinants of Health

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2023

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-30

**Rationale for Change**

The course description is being revised to better reflect the topics and content of the course.

## Course Information

**Faculty**
Faculty of Health

**Academic Unit**
School of Public Health Sciences

**Subject Code**
HLTH

**Number**
370

**Course Level**
300

**Title**
Ecological Determinants of Health

**Abbreviated Title**
Ecologic Determinants of Hlth

**Undergraduate Communication Requirement Identifier**
No,

Proposed

**Description**
This course explores the interconnections between ecological systems and human health, emphasizing that Earth's living systems are fundamental determinants of population well-being. Students will use an ecological framework and a One Health approach to examine how ecological considerations can be integrated into public health practice, health care, and policy. Topics may include the health benefits of contact with nature, climate change, ecosystem disruption, air and water quality, wildfires, built environments, and food systems and food security. The course also considers how ecological determinants interact with social and structural determinants of health to shape outcomes across populations.

Existing

**Description**
This course will examine the links between ecosystems, global ecological change, and the health and well-being of human communities. It will review the myriad ways in which the Earth, as a living system, is the ultimate determinant of human health. The course is divided into three parts: in the first part key environmental changes are addressed, including climate change, ecotoxicity, resource depletion, species extinction, and stresses on ocean systems as well as the social and human forces that drive these changes. The second part of the course focuses on the implications of these ecological changes and population health. The third part of the course will address potential solutions.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Lecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**

No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Students must be in level 3A or higher

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Health

## Dependencies

**Course Requirements (units)**

- Future Cities Diploma - Diploma in Future Cities View Program
- H-Health Sciences - Health Sciences (Bachelor of Science - Honours) View Program

**Course Requirements (no units)**

- H-Public Health - Public Health (Bachelor of Public Health - Honours) View Program

# KIN 121 - Biomechanics of Human Movement

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Rationale for Change**

With the introduction of KIN 120, Problem-based quantitative analysis for Kinesiology, (replacing MATH 124, Calculus and Vector Algebra for Kinesiology) as a required course in both the Kinesiology Honours and General degree plans, KIN 120 must also be added to the prerequisite list for KIN 121. Beginning September 2026, all kinesiology students will be expected to complete KIN 120.

## Course Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Kinesiology and Health Sciences

**Subject Code**

KIN

**Number**

121

**Course Level**

100

**Title**

Biomechanics of Human Movement

**Abbreviated Title**

Biomech of Human Movement

**Undergraduate Communication Requirement Identifier**

No,

**Description**

This course will provide students an understanding of human movement from a mechanical perspective, which enables identification of potential risks for injury, optimizes exercise prescription, and promotes understanding of clinical evaluations. Specifically, concepts related to functional anatomy, muscle and passive tissue mechanics, anthropometry, electromyography, and linked segment mechanics are introduced and applied to clinical, occupational, and athletic situations.

**Units**

0.50

**Exceptions to Fees or Academic Progress Units**

No,

**Components**

**Primary Component**

| Lecture | Lecture |
| --- | --- |

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

1. Complete all of the following
    - Must have completed the following:
        - PHYS111 - Physics 1
            - Must have completed at least 1 of the following:
                - **KIN120 - Problem-based quantitative analysis for Kinesiology**
                - MATH124 - Calculus and Vector Algebra for Kinesiology
                - MATH127 - Calculus 1 for the Sciences

**Corequisites**

Complete all of the following

- Corequisite is for H-Kinesiology students only
- Completed or concurrently enrolled in:
    - KIN121L - Biomechanics of Human Movement Laboratory (0.25)

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

**Prerequisites**

- KIN 221 - Advanced Biomechanics of Human Movement View Program
- KIN 221L - Advanced Biomechanics of Human Movement Laboratory View Program

**Course Requirements (units)**

- 4G-Kinesiology - Kinesiology (Bachelor of Science - Four-Year General) View Program

**Course Requirements (no units)**

- Biomechanics Option - Biomechanics Option View Program

**Course Requirements (units)**

- H-Kinesiology - Kinesiology (Bachelor of Science - Honours) View Program

**Course Lists**

- H-Knowledge Integration - Knowledge Integration (Bachelor of Knowledge Integration - Honours) View Program

# KIN 121L - Biomechanics of Human Movement Laboratory

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2024

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Rationale for Change**

With the introduction of KIN 120, Problem-based quantitative analysis for Kinesiology, (replacing MATH 124, Calculus and Vector Algebra for Kinesiology) as a required course in both the Kinesiology Honours and General degree plans, KIN 120 must also be added to the prerequisite list for KIN 121L. Beginning September 2026, all kinesiology students will be expected to complete KIN 120.

## Course Information

**Faculty**
Faculty of Health

**Academic Unit**
Department of Kinesiology and Health Sciences

**Subject Code**
KIN

**Number**
121L

**Course Level**
100

**Title**
Biomechanics of Human Movement Laboratory

**Abbreviated Title**
Biomech of Human Movement Lab

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This laboratory course provides students with practical tools used in the biomechanical assessment of human movement. The labs have been designed to assist with students' knowledge and understanding of the material discussed in the KIN121 lectures.

**Units**

**Exceptions to Fees or Academic Progress Units**

0.25

No,

**Components**
Laboratory

**Primary Component**
Laboratory

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

1. Complete all of the following
   - Must have completed the following:
     - KIN104L - Fundamentals of Kinesiology Laboratory
     - PHYS111 - Physics 1
   - Must have completed at least 1 of the following:
     - **KIN120 - Problem-based quantitative analysis for Kinesiology**
     - MATH124 - Calculus and Vector Algebra for Kinesiology

- MATH127 - Calculus 1 for the Sciences

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

**Prerequisites**

- KIN 221 - Advanced Biomechanics of Human Movement — View Program
- KIN 221L - Advanced Biomechanics of Human Movement Laboratory — View Program

**Corequisites**

- KIN 121 - Biomechanics of Human Movement — View Program

**Course Requirements (units)**

- 4G-Kinesiology - Kinesiology (Bachelor of Science - Four-Year General) — View Program

**Course Requirements (no units)**

- Biomechanics Option - Biomechanics Option — View Program

**Course Requirements (units)**

- H-Kinesiology - Kinesiology (Bachelor of Science - Honours) View Program

**Course Lists**

- H-Knowledge Integration - Knowledge Integration (Bachelor of Knowledge Integration - Honours) View Program

# KIN 390 - Clinical Field Placement

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Rationale for Change**

To revise the course description and change the enrollment rules to add Department Consent. The revised course description will broaden the learning opportunities available to students. The instructor will be responsible for identifying placement sites and mentors, on behalf of the department, who possess the expertise necessary to support the course learning outcomes. The addition of Department Consent reflects the need for communication between the students and instructors regarding the expectations associated with the field placement. This conversation should happen before students can enrol in the course.

## Course Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Kinesiology and Health Sciences

**Subject Code**

KIN

**Number**

390

**Course Level**

300

**Title**

Clinical Field Placement

**Abbreviated Title**

Clinical Field Placement

**Undergraduate Communication Requirement Identifier**

No,

Proposed

**Description**

This is an unpaid field placement for undergraduate kinesiology students in the Centre for Community, Clinical, and Applied Research Excellence (CCCARE) or a department-affiliated site. This field placement involves an unpaid commitment of 6-8 hours per week for at least 12 weeks of the term. Students will be mentored by registered kinesiologists, clinical exercise physiologists or equivalent who contribute to the delivery of community-engaged clinical exercise programs. This placement is structured based on principles and best practices of work-integrated learning, which not only reinforces theory-to-practice linkages, but also fosters growth and development in professionalism, communication, collaboration, and self-directed learning. An opportunity to exhibit civic responsibility through community service is also provided.

Existing

**Description**

This is an unpaid field placement for undergraduate kinesiology students in the Centre for Community, Clinical, and Applied Research Excellence (CCCARE). This field placement involves unpaid participation for no more than 6-8 hours per week for at least 12 weeks of the term. Students will be mentored by registered kinesiologists and clinical exercise physiologists who design and supervise delivery of community-engaged clinical exercise programs at CCCARE. This placement is structured based on principles and best practices of work-integrated learning, which not only reinforces theory-to-practice linkages, but also fosters growth and development in professionalism, communication, collaboration, and self-directed learning. An opportunity to exhibit civic responsibility through community service is also provided.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Field Studies

**Primary Component**
Field Studies

## Grading Information

**Standard Course Grading**
No,

**Special Course Grading**
Credit/No Credit

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

Proposed

**Consent to Add**
Department consent required,

Existing

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Complete 1 of the following
  - Must have completed the following:
    - KIN314 - Clinical Exercise Physiology (0.50)
  - Must have completed the following: KIN414
- Enrolled in 4G-Kinesiology, or H-Kinesiology

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

**Notes**

- Students who have not completed KIN314 but have substantial volunteer experience at CCCARE are eligible to enrol in KIN390. Email the course instructor for course override information.

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

There are no dependencies

Top

# REC 200 - Introduction to Children's Play

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2023

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-06-12

**Rationale for Change**

The title and description of the course are being revised to a focus on play within leisure and learning contexts which better reflects the current course offering and expertise of faculty members in the department who teach this course. The revised course description also provides clarity on course content and supports students who are considering post graduate studies in areas working with youth. Given that the revisions aim to move away from the emphasis on social psychology, the PSYCH 101 (cross-listed with PSYCH 101R) prerequisite has been removed.

## Course Information

**Faculty**

**Academic Unit**

Faculty of Health

Department of Recreation and Leisure Studies

| Subject Code | Number | Course Level |
| --- | --- | --- |
| REC | 200 | 200 |

Proposed

**Title**
Introduction to Children's Play

Existing

**Title**
Play, Creativity and Child Development

Proposed

**Abbreviated Title**
Intro Children's Play

Existing

**Abbreviated Title**
Play, Creativity & Child Dev

**Undergraduate Communication Requirement Identifier**
No,

Proposed

**Description**
The course explores historical and modern conceptualizations of play. Course topics may include indoor and outdoor play spaces, play-based learning, toys and games, technology and media literacy, play inequities, risky play and play beyond childhood. Students will develop the knowledge and skills for developing and supporting children's play in leisure and learning contexts.

Existing

**Description**
A critical analysis of definitions, concepts and assumptions of classical, recent and modern theories of play with implications for programming, planning and evaluating children's play.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**

**Primary Component**

| | |
|---|---|
| Lecture | Lecture |

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Health

## Dependencies

There are no dependencies

# REC 383 - Tourism Impacts - International Perspectives

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
2

## Proposal Details

**Proposal Type**

Change,

**Rationale for Change**

After an extensive curriculum review, Geography is proposing changes to many of their core courses to streamline and scaffold learning throughout their course offerings. GEOG 202 added as a pre-requisite to streamline the foundational course that leads into the Department of Geography specialization which includes GEOG323/REC383 (Economy and Development).

Related agenda proposals: N/A

**Consultations**

Consultations with Geography and Environmental Management have taken place.

## Course Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Recreation and Leisure Studies

**Subject Code**
REC

**Number**
383

**Course Level**
300

**Title**
Tourism Impacts - International Perspectives

**Abbreviated Title**
Tourism: Intl Perspectives

**Undergraduate Communication Requirement Identifier**
No,

**Description**
The course examines the nature, significance, and costs and benefits of tourism in the context of tourism destinations in developed and developing countries. It employs an international perspective to assess the

economic, environmental, social, and cultural impacts of tourism in diverse settings.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Lecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
Yes,

**Cross-Listed Courses**

GEOG 323 - Tourism Impacts - International Perspectives

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

1. Complete all of the following
    - Must have completed at least 1 of the following:
        - **GEOG202 - Geography of the Global Economy**
        - GEOG233 - Geography of Tourism
        - REC280 - Introduction to Tourism

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Environment | Faculty of Health

## Dependencies

**Course Requirements (units)**

- Sustainability Diploma - Diploma in Sustainability — View Program

**Course Requirements (no units)**

- Tourism Minor - Tourism Minor — View Program

**Course Requirements (units)**

- G-Aviation Specialization - Aviation Specialization — View Program
- GEM-Economy & Society Specialization - Economy and Society Specialization — View Program

- CEC-Aviation Specialization - Aviation Specialization View Program

**Course Requirements (no units)**

- G-Climate Change & Environment Specialization - Climate Change and Environment Specialization View Program

**Course Requirements (units)**

- G-Economy & Society Specialization - Economy and Society Specialization View Program
- GEM-Aviation Specialization - Aviation Specialization View Program

**Course Requirements (no units)**

- GA-Climate Change & Environment Specialization - Climate Change and Environment Specialization View Program

**Course Requirements (units)**

- GA-Economy & Society Specialization - Economy and Society Specialization View Program
- CEC-Economy & Society Specialization - Economy and Society Specialization View Program

**Course Requirements (no units)**

- GEM-Climate Change & Environment Specialization - Climate Change and Environment Specialization View Program

# REC 413 - Innovative Solutions in Sport and Recreation Management

Top

## Effective Date & Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**
Fall 2026

Existing

**Effective Term and Year**
Fall 2025

**Offering Number**
1

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-06-12

**Rationale for Change**

The Department of Recreation and Leisure Studies has revised the title of the Recreation and Sport Business program to Sport and Recreation Management. The new title better reflects the field of study and is more commonly recognized by industry partners. REC 413 is the capstone course for the program and new title better aligns with the revised program title.

## Course Information

**Faculty**
Faculty of Health

**Academic Unit**
Department of Recreation and Leisure Studies

**Subject Code**
REC

**Number**
413

**Course Level**
400

| Proposed |
| --- |
| **Title**<br>Innovative Solutions in Sport and Recreation Management |
| Existing |
| **Title**<br>Innovative Solutions in Recreation and Sport Business |

| Proposed |
| --- |
| **Abbreviated Title**<br>Innov Soln: Sport & Rec Mgmt |
| Existing |

**Undergraduate Communication Requirement Identifier**
No,

**Abbreviated Title**
Innov Solut in Rec & Sport Bus

**Description**
This capstone course allows students to reflect upon and integrate insights and skills they have gathered during their studies. Specifically, students will draw upon knowledge gained in previous courses and relevant work experience to identify and address complex managerial challenges. These challenges may be social and/or organizational in scope, and approaches used may be multi-sectorial in nature. Students will develop plans and measures that confront those challenges in innovative ways that best achieve stated goals and objectives.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Seminar

**Primary Component**
Seminar

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Must have completed the following:
  - REC213 - The Business of Professional Sport (0.50)
  - REC313 - Amateur Sport from Playground to Podium (0.50)
- Students must be in level 4A or higher
- Complete 1 of the following
  - Enrolled in H-Sport & Recreation Management, or JH-Sport & Recreation Management
  - Enrolled in H-Recreation & Sport Business, JH-Recreation & Sport Business

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

**Course Requirements (no units)**

- H-Sport & Recreation Management - Sport and Recreation Management (Bachelor of Arts - Honours) View Program
- JH-Sport & Recreation Management - Sport and Recreation Management (Joint Honours) View Program

# 4G-Kinesiology - Kinesiology (Bachelor of Science - Four-Year General)

Top

## Effective Date and Career

**Career**
Undergraduate,

| | |
|---|---|
| Proposed | |
| **Effective Term and Year** | Fall 2026 |
| Existing | |
| **Effective Term and Year** | Fall 2023 |

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
No,

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
Not Applicable,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

The Department of Kinesiology and Health Sciences will be adding new course, KIN 120, Problem-based quantitative analysis for Kinesiology, to the required courses list replacing MATH 124 (and MATH 127).

Moving the mathematics course into Kinesiology and Health Sciences, strengthens conceptual understanding and fosters continuity across the kinesiology curriculum, while embedding content in kinesiology-specific contexts. These connections transform abstract concepts into tools for solving real-world problems in human movement and performance. Integrating mathematics in this way will enhance student engagement and success through meaningful examples and applications that align with their academic and professional goals.

As a multidisciplinary department, Kinesiology and Health Sciences has identified various instructors with discipline-specific expertise that allows them to bridge theory and application effectively.

**Consultations (Departmental)**

The Associate Dean for Undergraduate Studies in the Faculty of Health informed the Associate Dean for Undergraduate Studies in the Faculty of Mathematics of Kinesiology and Health Sciences' (KHS) intention to offer the introductory mathematics course in the BSc KIN program (currently MATH 124) within KHS to ensure that mathematical concepts are taught in ways that directly support kinesiology learning outcomes.

At the suggestion of the Associate Dean for Undergraduate Studies in the Faculty of Mathematics, the Department Chair and Associate Chair for Undergraduate Studies in Kinesiology and Health Sciences met with the Assistant Dean, Core and Service Teaching in the Faculty of Mathematics to discuss the proposal. During the meeting, it was clarified that the pedagogical concerns were not related to omissions in MATH

124 content, but rather to the discipline-specific knowledge required to effectively integrate foundational mathematics within the kinesiology curriculum.

## General Program/Plan Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Kinesiology and Health Sciences

**Faculty**
Faculty of Health

**Undergraduate Credential Type**
Major

**Program Type**
Four Year General

**Degree**
Bachelor of Science (Health)

**Program/Plan Name**
Kinesiology (Bachelor of Science - Four-Year General)

**Systems of Study**
Regular,

## Admissions

**Admissions Entry Point**
Declare Plan,

## Requirements Information

**Invalid Combinations**
No,

**Average Requirement**
Yes,

**Minimum Average(s) Required**

- A minimum cumulative overall average of 53.0%.
- A minimum cumulative major average of 60.0%.

**Graduation Requirements**

- See Bachelor of Science (Health) degree-level requirements.
- Complete a total of 21.0 units:
  - 11.5 units of required courses.
  - 3.5 units of additional KIN courses.
  - 6.0 units of elective courses.

**Course Requirements (units)**

1. Required Courses
   - Complete all the following:
     - BIOL130 - Introductory Cell Biology (0.50)
     - BIOL273 - Principles of Human Physiology 1 (0.50)
     - CHEM120 - General Chemistry 1 (0.50)
     - HEALTH107 - Sociology of Activity, Health, and Well-Being (0.50)
     - KIN100 - Regional Human Anatomy (0.50)
     - KIN100L - Regional Human Anatomy Laboratory (0.25)

        - KIN104 - Fundamentals of Kinesiology (0.50)
        - KIN104L - Fundamentals of Kinesiology Laboratory (0.25)
        - **KIN120 - Problem-based quantitative analysis for Kinesiology (0.50)**
        - KIN121 - Biomechanics of Human Movement (0.50)
        - KIN121L - Biomechanics of Human Movement Laboratory (0.25)
        - KIN146 - Introduction to Human Nutrition (0.50)
        - KIN202 - Exercise Physiology and Metabolism (0.50)
        - KIN202L - Exercise Physiology and Metabolism Laboratory (0.25)
        - KIN204 - Movement Assessment and Exercise Prescription (1.00)
        - KIN204L - Movement Assessment and Exercise Prescription Laboratory (0.50)
        - KIN217 - Human Biochemistry (0.50)
        - KIN221 - Advanced Biomechanics of Human Movement (0.50)
        - KIN221L - Advanced Biomechanics of Human Movement Laboratory (0.25)
        - KIN232 - Research Design and Statistics (0.50)
        - KIN255 - Fundamentals of Neuroscience (0.50)
        - KIN255L - Fundamentals of Neuroscience Laboratory (0.25)
        - KIN470 - Seminar in Kinesiology (0.50)
        - PHYS111 - Physics 1 (0.50)
    - Complete 1 of the following:
        - PSYCH101 - Introductory Psychology (0.50)
        - PSYCH101R - Introductory Psychology (0.50)

**Grand Total Units:12**

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

**Notes**

- All students in Year One are honours students.
- See Faculty of Health for recommended course sequences.

## Specializations

**Specializations for this Major**

Yes - Optional,

**Specialization Details**

Students may choose to focus their elective choices by completing an available specialization.

**Specializations List**

Rehabilitation Sciences Specialization

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**
Faculty of Health

## Dependencies

**Prerequisites**

- KIN 391 - Research Apprenticeship View Program
- KIN 400 - Athletic Injury Practicum View Program
- KIN 470 - Seminar in Kinesiology View Program
- KIN 217 - Human Biochemistry View Program

**Antirequisites**

- HEALTH 100 - Foundations of a Healthy Lifestyle View Program
- HEALTH 150 - Foundations of Human Anatomy and Physiology View Program

**Prerequisites**

- KIN 140L - Sports Injury Management Laboratory View Program
- MATH 124 - Calculus and Vector Algebra for Kinesiology View Program
- KIN 491 - Clinical Kinesiology - Sports Injuries Assessment View Program
- KIN 471 - Contemporary Issues in Kinesiology View Program
- KIN 390 - Clinical Field Placement View Program

**Specialization is available for students in the following majors**

- Rehabilitation Sciences Specialization - Rehabilitation Sciences Specialization View Program

# H-Kinesiology - Kinesiology (Bachelor of Science - Honours)

Top

## Effective Date and Career

**Career**
Undergraduate,

Proposed

**Effective Term and Year**

Fall 2026

Existing

**Effective Term and Year**
Fall 2025

## Proposal Details

**Proposal Type**
Change,

**Academic Unit Approval**
2025-09-24

**Quality Assurance Designation**
Minor Modification Qad

**Is there an impact to existing students?**
No,

**Is the credential name changing?**
No,

**Co-operative System of Study and Requirements**
No,

**Creating or Changing Invalid Combinations**
No,

**Change to Learning Outcomes**
No,

**Rationale and Background for Change(s)**

The Department of Kinesiology and Health Sciences will be adding new course, KIN 120, Problem-based quantitative analysis for Kinesiology, to the required courses list replacing MATH 124 (and MATH 127).

Moving the mathematics course into Kinesiology and Health Sciences, strengthens conceptual understanding and fosters continuity across the kinesiology curriculum, while embedding content in kinesiology-specific contexts. These connections transform abstract concepts into tools for solving real-world problems in human movement and performance. Integrating mathematics in this way will enhance student engagement and success through meaningful examples and applications that align with their academic and professional goals.

As a multidisciplinary department, Kinesiology and Health Sciences has identified various instructors with discipline-specific expertise that allows them to bridge theory and application effectively.

**Consultations (Departmental)**

The Associate Dean for Undergraduate Studies in the Faculty of Health informed the Associate Dean for Undergraduate Studies in the Faculty of Mathematics of Kinesiology and Health Sciences' (KHS) intention to offer the introductory mathematics course in the BSc KIN program (currently MATH 124) within KHS to ensure that mathematical concepts are taught in ways that directly support kinesiology learning outcomes.

At the suggestion of the Associate Dean for Undergraduate Studies in the Faculty of Mathematics, the Department Chair and Associate Chair for Undergraduate Studies in Kinesiology and Health Sciences met with the Assistant Dean, Core and Service Teaching in the Faculty of Mathematics to discuss the proposal. During the meeting, it was clarified that the pedagogical concerns were not related to omissions in MATH 124 content, but rather to the discipline-specific knowledge required to effectively integrate foundational mathematics within the kinesiology curriculum.

## General Program/Plan Information

**Faculty**

Faculty of Health

**Academic Unit**

Department of Kinesiology and Health Sciences

**Faculty**

Faculty of Health

**Undergraduate Credential Type**

Major

**Program Type**

Honours

**Degree**

Bachelor of Science (Health)

**Program/Plan Name**
Kinesiology (Bachelor of Science - Honours)

**Systems of Study**
Co-operative, Regular,

## Admissions

**Admissions Entry Point**
Direct Entry,

## Requirements Information

**Invalid Combinations**
No,

| Average Requirement | Minimum Average(s) Required |
| --- | --- |

Yes,

- A minimum cumulative overall average of 63.0%.
- A minimum cumulative major average of 67.0%.

**Graduation Requirements**

- See Bachelor of Science (Health) degree-level requirements.
- Complete a total of 21.0 units:
  - 11.5 units of required courses.
  - 3.5 units of additional KIN courses.
  - 6.0 units of elective courses.

**Co-operative Education Program Requirements**

For students in the co-operative system of study, see Bachelor of Science (Health) co-operative education program requirements.

**Course Requirements (units)**

1. Required Courses
   - Complete all the following:
     - BIOL130 - Introductory Cell Biology (0.50)
     - BIOL273 - Principles of Human Physiology 1 (0.50)
     - CHEM120 - General Chemistry 1 (0.50)
     - HEALTH107 - Sociology of Activity, Health, and Well-Being (0.50)
     - KIN100 - Regional Human Anatomy (0.50)
     - KIN100L - Regional Human Anatomy Laboratory (0.25)
     - KIN104 - Fundamentals of Kinesiology (0.50)
     - KIN104L - Fundamentals of Kinesiology Laboratory (0.25)
     - **KIN120 - Problem-based quantitative analysis for Kinesiology (0.50)**
     - KIN121 - Biomechanics of Human Movement (0.50)
     - KIN121L - Biomechanics of Human Movement Laboratory (0.25)
     - KIN146 - Introduction to Human Nutrition (0.50)
     - KIN202 - Exercise Physiology and Metabolism (0.50)
     - KIN202L - Exercise Physiology and Metabolism Laboratory (0.25)
     - KIN204 - Movement Assessment and Exercise Prescription (1.00)
     - KIN204L - Movement Assessment and Exercise Prescription Laboratory (0.50)
     - KIN217 - Human Biochemistry (0.50)
     - KIN221 - Advanced Biomechanics of Human Movement (0.50)
     - KIN221L - Advanced Biomechanics of Human Movement Laboratory (0.25)
     - KIN232 - Research Design and Statistics (0.50)
     - KIN255 - Fundamentals of Neuroscience (0.50)
     - KIN255L - Fundamentals of Neuroscience Laboratory (0.25)
     - PHYS111 - Physics 1 (0.50)
   - Complete 1 of the following:
     - KIN432 - Research Project (0.50)
     - KIN470 - Seminar in Kinesiology (0.50)
   - Complete 1 of the following:
     - **PSYCH101 - Introductory Psychology (0.50)**
     - **PSYCH101R - Introductory Psychology (0.50)**
     - ~~MATH124 - Calculus and Vector Algebra for Kinesiology (0.50)~~

- ~~MATH127 - Calculus 1 for the Sciences (0.50)~~

**Grand Total Units:11.5**

**Course Requirements (no units)**

Required Courses

- No Rules

**Course Lists**

Required Courses

- No Rules

**Are there cross-listed courses listed in requirements?**
Yes,

**Cross-Listings Options**
All cross-listings to be displayed,

**Notes**

- See Faculty of Health for recommended course sequences.
- Joint Honours: Honours Kinesiology students are eligible to pursue a joint honours degree with another academic area of study. Application for joint honours must be approved by the Associate Chair, Undergraduate Studies, of both academic units; course selection, year-end standing, and graduation must also be approved. Students interested in pursuing a joint honours degree should consult with the academic advisor for further information and should begin to take the appropriate courses no later than the beginning of Year Two.

## Specializations

**Specializations for this Major**
Yes - Optional,

**Specialization Details**

Students may choose to focus their elective choices by completing an available specialization.

**Specializations List**

Rehabilitation Sciences Specialization

## Undergraduate Plan Guidelines

## Workflow Information

**Change to Undergraduate Communication Requirement**
No,

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Health

## Dependencies

**Prerequisites**

- KIN 391 - Research Apprenticeship View Program
- KIN 307 - Methods in Biochemical and Physiological Research View Program
- KIN 400 - Athletic Injury Practicum View Program
- KIN 431 - Research Proposal View Program
- KIN 433 - Senior Essay View Program
- KIN 470 - Seminar in Kinesiology View Program
- KIN 217 - Human Biochemistry View Program

**Antirequisites**

- HEALTH 100 - Foundations of a Healthy Lifestyle View Program
- HEALTH 150 - Foundations of Human Anatomy and Physiology View Program

**Prerequisites**

- KIN 140L - Sports Injury Management Laboratory View Program
- MATH 124 - Calculus and Vector Algebra for Kinesiology View Program
- KIN 491 - Clinical Kinesiology - Sports Injuries Assessment View Program
- KIN 471 - Contemporary Issues in Kinesiology View Program
- KIN 390 - Clinical Field Placement View Program

**Specialization is available for students in the following majors**

- Rehabilitation Sciences Specialization - Rehabilitation Sciences Specialization View Program

## Date 2026/01/20

Show Empty Fields

## Meeting Information

**Agenda Page TitleSUC - 2026-02 - Consent Agenda - Faculty of Mathematics**

**Career Level**
Undergraduate,

**Faculty/UnitMathematics**

**Date2026-02-04** **Time** **Location**

**Summary**

**1. Course Retirements, New Courses, and Course Changes (Motion 1)**

**Course Retirements:**

**No business.**

**New Courses:**

- **AMATH446 - *Introduction to Mathematics of Deep Learning***
- **CO448 - *The Probabilistic Method***
- **DATSC101 - *Introduction to Data Science***
- **DATSC401 - *Capstone in Data Science***
- **MTHEL490 - *Interdisciplinary Capstone***

- **MTHEL491 -** ***Interdisciplinary Capstone 2***

**Course Changes**

- **AMATH473 -** ***Changes to course title, prerequisites, and removal of cross-listing***
- **AMATH474 -** ***Changes to course title, description, prerequisites, and removal of cross-listing***
- **CO372 -** ***Changes to prerequisites***
- **CO463 -** ***Changes to prerequisites***
- **CO466 -** ***Changes to prerequisites***
- **CO471 -** ***Changes to prerequisites***
- **COMM103 -** ***Updating effective date to accompany ECON 100 motion***

**2. Minor Program/Plan Modifications (Motion 2)**

- **Mathematics Studies, Business Specialization -** ***Changes to presentation in Calendar, no changes to actual plan requirements***
- **H-Mathematical Studies -** ***Changes to presentation in Calendar, no changes to actual plan requirements***
- **H-Mathematical Economics (BMath) -** ***Update to invalid combinations to include 3 new ECON minor plans***
- **Mathematics Minor -** ***Updating graduation requirements to eliminate fail limit***
- **3G-Mathematics -** ***Additional options in required courses list to accommodate BCS students***
- **Applied Mathematics Minor -** ***Update to required courses***
- **Engineering Specialization -** ***Update to graduation requirements and required courses***
- **Physics Specialization -** ***Update to required courses***
- **H-Mathematical Physics (BMath) -** ***Update to required courses***

**Other Business**

## Course Proposals

**Courses: Retire No proposals have been added.**

**Courses: New**

| Code | Title | Type | Workflow Step |
|---|---|---|---|

| | | | |
|---|---|---|---|
| AMATH 446 | Introduction to Mathematics of Deep Learning | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| CO 448 | The Probabilistic Method | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| DATSC 101 | Introduction to Data Science | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| DATSC 401 | Capstone in Data Science | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| MTHEL 490 | Interdisciplinary Capstone | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| MTHEL 491 | Interdisciplinary Capstone 2 | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

**Courses: Changes**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| AMATH 473 | Quantum Theory | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| AMATH 474 | Advanced Quantum Theory: Quantum Information and Foundations | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| CO 372 | Portfolio Optimization Models | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| CO 463 | Convex Optimization and Analysis | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| CO 466 | Continuous Optimization | Courses | SUC Subcommittee, SUC Curricular |

| | | | |
|---|---|---|---|
| | | | Subcommittee |
| CO 471 | Semidefinite Optimization | Courses | SUC Subcommittee, SUC Curricular Subcommittee |
| COMM 103 | Principles of Economics | Courses | SUC Subcommittee, SUC Curricular Subcommittee |

## Programs & Plans Proposals

**Programs & Plans: Retire No proposals have been added.**

**Programs & Plans: Major Modifications No proposals have been added.**

**Programs & Plans: Minor Modifications**

| Code | Title | Type | Workflow Step |
|---|---|---|---|
| MS-Business Specialization | Business Specialization | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| H-Mathematical Studies | Mathematical Studies (Bachelor of Mathematics - Honours) | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| H-Mathematical Economics (BMath) | Mathematical Economics (Bachelor of Mathematics - Honours) | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| Mathematics Minor | Mathematics Minor | Programs | SUC Subcommittee, SUC Curricular Subcommittee |

| | | | |
|---|---|---|---|
| 3G-Mathematics | Mathematics (Bachelor of Mathematics, Three-Year General) | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| Applied Mathematics Minor | Applied Mathematics Minor | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| Engineering Specialization | Engineering Specialization | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| Physics Specialization | Physics Specialization | Programs | SUC Subcommittee, SUC Curricular Subcommittee |
| H-Mathematical Physics (BMath) | Mathematical Physics (Bachelor of Mathematics - Honours) | Programs | SUC Subcommittee, SUC Curricular Subcommittee |

## Regulations Proposals

**Regulations: Retire No proposals have been added.**

**Regulations: New No proposals have been added.**

**Regulations: Changes No proposals have been added.**

# AMATH 446 - Introduction to Mathematics of Deep Learning

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-06-19

**Rationale for New Course**

This course aims to introduce senior undergraduates and beginning graduate students to the mathematics of deep learning. Beyond presenting the foundational concepts of deep neural networks, the course will focus on three primary aspects of deep learning theory: approximation, optimization, and generalization. These concepts will be presented in simplified settings to avoid excessive technicalities in the proofs while preserving the essential mathematics in a self-contained format. The topics are structured to fit within 36 lecture hours.

**Relationship with existing courses**

- The course complements existing courses on neural networks and deep learning by focusing on the mathematical concepts behind the architectures and algorithms. For instance, AMATH 445/645: Scientific Machine Learning introduces neural network architectures and focuses on applications in science, medicine and engineering; CS480/680: Introduction to Machine Learning (only open to CS and DS students) provides a broad overview of machine learning algorithms and their implementation, while CS 479/679: Neural Networks centers on methods for designing and training neural networks. Note that CS 479/679 will be cross-listed with AMATH 449/649.
- CS 485/685: Statistical and Computational Foundations of Machine Learning (only open to CS and DS students) introduces the statistical and

computational foundations for machine learning, broadly utilizing the framework of statistical learning. The proposed course more specifically focuses on deep neural networks, covering theoretical aspects of approximation, optimization, and generalization theory, and is open to Applied Math students and other students in the Math Faculty.
- As noted above, both CS 480/680 and CS 485/685 are exclusively available to CS or Data Science students; in contrast, the goal of the proposed course is to provide a comprehensive introduction to the mathematics of deep learning targeted at Applied Mathematics students and other students with a mathematical background and interest.

**Proposed list of topics (as already covered in Winter 2025 as a topics course):**

**(1) Introduction to deep learning (1 week)**

- Motivation and success stories of deep learning
- Basic definitions of artificial neural networks
- Basic ingredients of neural network learning
- Overview of the course

**(2) Approximation theory (3.5 weeks)**

- Universal approximation theorems
- Degree of approximation
- Approximation of compositional functions
- Approximation by Re LU networks

**(3) Optimization theory (3 weeks)**

- Unconstrained convex and non-convex optimization
- Gradient descent with convergence analysis
- Escaping saddle points
- Stochastic gradient descent
- Accelerated gradient descent

**(4) Generalization theory (3.5 weeks)**

- PAC learning
- Basic generalization error bounds
- VC-dimension and Rademacher complexity
- Norm-based bounds

- PAC-bayes bounds

- Students were required to complete three assignments, a final assessment, and an individual project on a theoretical topic.

The Linear Algebra requirement is intended to ensure that students are familiar with key concepts such as diagonalization, eigenvalues, and eigenvectors, which are necessary prerequisites for this course.

*Approved at UAC 20251027.*

*Approved at FC 20251125.*

### Consultations

This course has been offered as a topics course and consultations have taken place since 2023: Jun Liu met with David Jao (then CO Undergraduate Associate Chair) on October 11, 2023, to discuss the outline of the courses and prerequisites; Jao recommended dropping the prerequisite AMATH 250 so that CO students could take the course, which was implemented in the course proposal. Jun Liu also met with Yaoliang Yu (instructor for CO673/CS794: Optimization for Data Science) on September 19, 2023, and with Jeff Orchard (instructor for CS 479/679: Neural Networks) on September 13 and October 6, 2023, to discuss course contents and potential overlaps. They all provided positive feedback and expressed no concerns about overlaps, which are quite minimal as explained in the proposal. Jun Liu met with Stephen Vavasis (CO), Yaoliang Yu (CS), and Jeff Orchard (CS) to update them on the course development in June 2025 and the positive feedback was confirmed.

## Course Information

**Faculty**

Faculty of Mathematics

**Academic Unit**

Department of Applied Mathematics

**Subject Code**
AMATH

**Number**
446

**Course Level**
400

**Title**
Introduction to Mathematics of Deep Learning

**Abbreviated Title**
Intro Math of Deep Learning

**Undergraduate Communication Requirement Identifier**
No,

**Description**
This course introduces the basic concepts of deep learning in a mathematically rigorous fashion. Topics include mathematical definitions of deep neural networks, approximation theory, gradient-based optimization, and generalization analysis.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Lecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Must have completed at least 1 of the following:
  - ECE203 - Probability Theory and Statistics 1 (0.50)
  - PHYS267 - Probability, Statistics, and Data Analysis for Physics and Astronomy (0.50)
  - STAT206 - Statistics for Software Engineering (0.50)
  - STAT220 - Probability (Non-Specialist Level) (0.50)
  - STAT230 - Probability (0.50)
  - STAT240 - Probability (Advanced Level) (0.50)
  - SYDE212 - Probability and Statistics (0.50)
- Must have completed at least 1 of the following:
  - ECE206 - Advanced Calculus 2 for Electrical Engineers (0.50)
  - MATH207 - Calculus 3 (Non-Specialist Level) (0.50)

    - MATH212 - Advanced Calculus 2 for Electrical Engineers (0.50)
    - MATH217 - Calculus 3 for Chemical Engineering (0.50)
    - MATH227 - Calculus 3 for Honours Physics (0.50)
    - MATH237 - Calculus 3 for Honours Mathematics (0.50)
    - MATH247 - Calculus 3 (Advanced Level) (0.50)
    - SYDE211 - Calculus 3 (0.50)
- Must have completed at least 1 of the following:
    - MATH114 - Linear Algebra for Science (0.50)
    - MATH115 - Linear Algebra for Engineering (0.50)
    - MATH136 - Linear Algebra 1 for Honours Mathematics (0.50)
    - MATH146 - Linear Algebra 1 (Advanced Level) (0.50)
    - MATH225 - Applied Linear Algebra 2 (0.50)

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Mathematics

## Dependencies

**Course Requirements (no units)**

- H-Applied Mathematics - Applied Mathematics (Bachelor of Mathematics - Honours) View Program
- H-Applied Mathematics with Scientific Computing & Scientific Machine Learning - Applied Mathematics with Scientific Computing and Scientific Machine Learning (Bachelor of Mathematics - Honours)
- JH-Applied Mathematics - Applied Mathematics (Joint Honours) View Program View Program

# CO 448 - The Probabilistic Method

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-07-28

**Rationale for New Course**

The probabilistic method is a fundamental technique in modern combinatorics, offering powerful tools to prove the existence of mathematical structures with desired properties. Its versatility has made it an essential component in research areas such as combinatorics, computer science, and pure mathematics. As the method continues to influence a broad range of fields, there is a growing demand for formal training in this area. Introducing a dedicated course will not only support advanced research efforts across disciplines but also align our curriculum with those of peer institutions, many of which already offer similar undergraduate and graduate-level courses.

An optional reference for students is the textbook The Probabilistic Method by Joel Spencer and Noga Alon.

Weekly breakdown of material:

· Week 1: First moment principle; preliminary in probability theory and asymptotics
· Week 2: Chebyshev's inequality; threshold
· Week 3: Alternation
· Week 4: Lovasz local lemma
· Week 5: Chernoff bounds and Martingale inequalities
· Week 6: Talagrand's inequality
· Week 7: Correlation inequalities, Janson's inequality
· Week 8: Derandomisation
· Weeks 9-12 (Selected topics - depending on instructor):
o Balls into bins and Poisson approximation – 1 week
o Optional stopping theorem – 1 week
o Algorithmic Lovasz local lemma – 1 week
o Spread method – 1 week
o Property testing – 1 week
o Coding theory – 1 week
o Birth of a giant component in random graphs – 1 week
o Modern counting techniques – 1 to 2 weeks
o Container's method – 1 to 2 weeks
o Cluster expansion – 1 to 2 weeks
o Absorption method – 1 to 2 weeks

*Approved at UAC 20251027.*

*Approved at FC 20251125.*

## Course Information

**Faculty**

Faculty of Mathematics

**Academic Unit**

Department of Combinatorics and Optimization

**Subject Code**

CO

**Number**

448

**Course Level**

400

**Title**

The Probabilistic Method

**Abbreviated Title**

The Probabilistic Method

**Undergraduate Communication Requirement Identifier**

No,

**Description**

The probabilistic method is a collection of proof techniques to show the existence of a combinatorial structure by showing a random element in an appropriate probability space has the desired structure with a positive probability. The course will introduce the fundamental techniques and give numerous applications in a wide variety of areas, including graph theory, combinatorics, number theory, geometry, optimization, randomized algorithms, and information theory. In

particular, normally the following topics will be discussed: method of the first moment, Chebyshev's inequality, alterations, the Lovasz local lemma, correlation inequalities, exponential concentration inequalities, and applications.

**Units**
0.50

**Exceptions to Fees or Academic Progress Units**
No,

**Components**
Lecture

**Primary Component**
Lecture

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Must have completed the following:

- CO342 - Introduction to Graph Theory (0.50)

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

## Dependencies

There are no dependencies

# DATSC 101 - Introduction to Data Science

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-09-19

**Rationale for New Course**

Data science is an interdisciplinary collection of tools, strategies, and ways of thinking used to discover and derive insights from data. It combines statistics, mathematics, and computer science in a synergistic manner that is not obvious

when courses from these disciplines are taken in isolation. As such, and especially for novices in this field, a survey course that overviews how these different disciplines, when combined, can solve real and impactful problems, would be very beneficial. It would serve to preview what data science is and can achieve in a way individual courses from statistics, computer science, and mathematics cannot. Through diverse case studies, students will be exposed to introductory (though impactful) data wrangling, data analysis, and data communication skills. A course of this nature is commonplace at similar universities. For example:

- Data 8 @ Berkeley
- DSCI 100 @ UBC
- STA 130 @ Uof T
- DATASCI 100 @ Stanford
- BSDS 100 @ USF

This course is meant to pique a student's interest in data science and give them **broad literacy in data science.** They won't become specialists after one course, but they'll be able to work with data responsibly, interpret results, and continue learning.

*Approved at UAC 20250929.*

*Approved at FC 20251125.*

**Consultations**

Data Science Undergraduate Steering Committee.

**Supporting Documentation**

- New Course Proposal DATASC101.docx

## Course Information

**Faculty**

Faculty of Mathematics

**Academic Unit**

Department of Statistics and Actuarial Science

**Subject Code**

DATSC

**Number**

101

**Course Level**

100

**Title**

Introduction to Data Science

**Abbreviated Title**

Intro Data Science

**Undergraduate Communication Requirement Identifier**

No,

**Description**

This introductory data science course provides a comprehensive foundation in statistical reasoning, computational thinking, and mathematical modelling as it relates to data-driven decision-making. Students will learn to acquire, manage, analyze, and interpret diverse types of data using modern programming tools. Through hands-on projects involving real-world datasets from a variety of domains, students will develop skills in data wrangling, visualization, pattern discovery, and predictive modelling. Emphasis is placed on reproducible workflows, ethical considerations like privacy, and effective communication of data-driven insights. Designed for beginners, the course equips students to address complex, modern problems using the tools and concepts of data science.

**Units**

0.50

**Exceptions to Fees or Academic Progress Units**

No,

**Components**

**Primary Component**

| | |
|---|---|
| LectureTutorialLaboratory | Lecture |

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

No Rules

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Mathematics

## Dependencies

There are no dependencies

# DATSC 401 - Capstone in Data Science

Top

## Effective Date & Career

**Career**
Undergraduate,

**Effective Term and Year**
Fall 2026

## Proposal Details

**Proposal Type**
New,

**Academic Unit Approval**
2025-09-19

**Rationale for New Course**

Data science is an interdisciplinary collection of tools, strategies, and ways of thinking used to discover and derive insights from data. It combines statistics, mathematics, and computer science in a synergistic manner that is not obvious when courses from these disciplines are taken in isolation. At the undergraduate level, there is very little emphasis placed on how individual courses related to each other, and how their content can be combined to address real-world challenges. In consultation with graduates of the BMATH Data Science program, it has become clear that the BMATH Data Science program effectively teaches individual data science topics, but it falls short with respect to their synthesis. Graduates report not having a strong sense of what data science is or what data scientists do, at the conclusion of the program.

This deficiency is intended to be resolved by the proposed capstone, a project-based course that integrates concepts from statistics, mathematics, and computer science for the sole purpose of constructing data-driven solutions to real and impactful problems. Such a course will benefit the student experience, elevate the

preparedness of our graduates for the real-world, and improve the quality of their outcomes once they leave the program.

**Learning Outcomes:** By the end of this course, students will be able to:

1. **Problem Definition:** Formulate a well-defined research question or business problem that can be addressed using data science methods.
2. **Data Acquisition & Management:** Collect, clean, and manage complex datasets from real-world sources, ensuring data integrity and reproducibility.
3. **Methodological Application:** Select and apply appropriate statistical, computational, and machine learning techniques to analyze data and generate insights.
4. **Critical Evaluation:** Assess the validity, limitations, and ethical implications of the chosen methods, data sources, and results.
5. **Integration of Skills:** Synthesize concepts from programming, statistics, machine learning, and domain knowledge to create a coherent end-to-end analysis.
6. **Communication:** Communicate technical findings effectively to both technical and non-technical audiences through written reports, visualizations, and oral presentations.
7. **Collaboration & Project Management:** Demonstrate professional teamwork, project planning, and time management skills in completing a substantial, open-ended project.

*Approved at UAC 20251027.*

*Approved at FC 20251125.*

**Consultations**

Data Science Undergrad Program Steering Committee discussed the creation of this course (along with changed to BMath Data Science in Winter 2025). The Director of BMath Data Science also consulted with alumni to discuss the restructuring of the plan and there was widespread support for the creation of a capstone course.

## Course Information

**Faculty**

Faculty of Mathematics

**Academic Unit**

Dean of Mathematics Office

**Subject Code**

DATSC

**Number**

401

**Course Level**

400

**Title**

Capstone in Data Science

**Abbreviated Title**

Capstone in Data Science

**Undergraduate Communication Requirement Identifier**

No,

**Description**

This course is the culminating experience of the data science major, designed to integrate and apply the knowledge, skills, and tools students have developed throughout their coursework. Students will address a complex, real-world data science problem from start to finish, defining a research question or business challenge, acquiring and cleaning data, applying appropriate statistical and computational methods, developing models or analytical pipelines, and effectively communicating findings to both technical and non-technical audiences. Emphasis is placed on project management, ethical considerations, reproducibility, and professional presentation. The capstone provides students with an opportunity to demonstrate mastery of the data science process and to produce a portfolio-ready project that showcases their ability to generate actionable insights from data.

**Units**

0.50

**Exceptions to Fees or Academic Progress Units**

No,

**Components**

**Primary Component**

| | |
|---|---|
| LectureTutorialLaboratory | Lecture |

## Grading Information

**Standard Course Grading**
Yes,

## Cross-Listing Information

**Is this course cross-listed?**
No,

## Repeatable Courses

**Can this course be repeated for credit?**
No,

## Enrolment Rules

**Consent to Add**
No consent required,

**Consent to Drop**
No consent required,

**Prerequisites**

Complete all of the following

- Students must be in level 4A or higher
- Enrolled in H-Data Science (BMath)

**Corequisites**

No Rules

**Antirequisites**

No Rules

## Course Notes

## Workflow Information

**Workflow Path**
Committee approvals,

**Faculty/AFIW Path(s) for Workflow**

Faculty of Mathematics

## Dependencies

There are no dependencies

Top