



**Faculty of Science**

Office of the Dean  
St. John's, NL Canada A1B 3X7  
Tel: 709 864 8154 Fax: 709 864 3316  
deansci@mun.ca [www.mun.ca/science](http://www.mun.ca/science)

**MEETING OF THE FACULTY COUNCIL OF THE FACULTY OF SCIENCE**

A regular meeting of the Faculty Council of the Faculty of Science will be held on Wednesday, July 15, 2020, at 1:00 p.m. by Webex.

**AGENDA**

- 1. Regrets**
- 2. Adoption of the Minutes of June 17, 2020**
- 3. Business Arising from the Minutes**
- 4. Correspondence: None**
- 5. Reports of Standing Committees:**
  - A. Undergraduate Studies Committee:**
    - a. Department of Biology, New Course, Biology 3630, Freshwater Biology (Paper 5A.a., pages 6-40)
  - B. Graduate Studies Committee:**
    - a. Department of Computer Science, Proposed Changes to Graduate Program (Paper 5B.a., pages 41-42)
- 6. Reports of Delegates from Other Councils**
- 7. Report of the Dean**
- 8. Question Period**
- 9. Adjournment**

A handwritten signature in black ink, appearing to read "Travis Fridgen", with a long horizontal stroke extending to the right.

Travis Fridgen, Ph.D.  
Acting Dean of Science



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**FACULTY OF SCIENCE  
FACULTY COUNCIL OF SCIENCE  
MINUTES OF MEETING OF JUNE 17, 2020**

A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, June 17, 2020, at 1:00 p.m. using Webex.

**FSC 2756 Present**

**Biochemistry**

M. Berry, R. Bertolo, V. Booth, S. Harding

**Biology**

T. Chapman, S. Dufour, E. Edinger, Y. Wiersma

**Chemistry**

E. Merschrod

**Computer Science**

E. Brown, Y. Chen, L. Peña-Castillo

**Earth Sciences**

G. Dunning, G. Layne

**Marine Institute**

**Mathematics & Statistics**

I. Booth, R. Haynes, T. Sheel, S. Sullivan, A. Variyath

**Ocean Sciences**

**Physics & Physical Oceanography**

S. Curnoe, J. Munroe

**Psychology**

K. Fowler, A. Swift-Gallant, C. Thorpe, C. Walsh

**Dean of Science Office**

S. Bungay, K. Foss, T. Fridgen, G. Jackson, G. Kenny, T. Mackenzie, R. Newhook, L. Zedel

**Staff**

M. Bromerek, J. Burke, C. Hyde, A. Langille, S. Malek, J. Pittman, B. Power, T. Stuckless, E. Whelan

**Graduate Students**

A. Alfosool

**Guests**

C. Andersen, P. Banahene, N. Kuzmochka

**FSC 2757**

**Regrets**

G. Fletcher

**FSC 2758**

**Adoption of Minutes**

**Moved:** Minutes of the meeting of May 20, 2020, meeting be adopted (Berry/Merschrod).  
**Carried.**

**FSC 2759**

**Business Arising:** None

**FSC 2760**

**Correspondence:** Draft Strategic Framework for Indigenization 2020-2025. Presentation by Catharyn Andersen, special advisor on Indigenous affairs. C. Andersen briefly went through the report and noted that it is important for those reading the report to be familiar with the language provided in the glossary before reading the document. Consultations such as this one are important for the entire university community. Adding indigenous content and indigenization are two different things. It is important not to work at indigenization of courses on your own, but seek out supports and consult with those who have those skills and knowledge.

**FSC 2761**

**Reports of Standing Committees:**

**A. Undergraduate Studies Committee:** None

**B. Graduate Studies Committee**

Presented by Graham Layne, Chair, Graduate Studies Committee.

**a.** Department of Computer Science, Request for Approval of a Graduate Course: COMP 6934, Introduction to Data Visualization (Layne/Munroe).  
**Carried.**

**b.** Department of Computer Science, Special Topics Course, COMP 6980, Special Topics in Artificial Intelligence, approved by the committee and presented to Faculty Council for information only.

- c. Department of Computer Science, Special Topics Course, COMP 691A/B, Special Research Project, approved by the committee and presented to Faculty Council for information only.
- d. Department of Physics and Physical Oceanography, Special Topics Course, PHYS 6061, Applications of Classical and Quantum Formalisms in Finance and Other Social Sciences, approved by the committee and presented to Faculty Council for information only.

**C. Nominating Committee:** None

**D. Library Committee:** None

## **FSC 2762 Report of the Dean**

Presented by Travis Fridgen, Acting Dean

### **1. Faculty Hires**

The Acting Dean has made both a verbal and written request to the Vice-President (Academic) to continue renewing faculty and advised that departments are willing to hold fully remote interviews from start to finish. The VPA is well aware of the needs of the faculty and I am confident that we will be able to continue recruiting for absolutely necessary positions.

### **2. Course Equivalencies**

The Acting Dean reminded everyone to please look at the draft interim report on equivalencies on D2L and participate in the survey which will be available until June 22, 2020.

### **3. Beyond Level 4 Access to Campus**

It is understood that we are currently experiencing Level 3, and beyond, access to campus. Vice-Presidents' Council has decided to allow faculty members access to the campus building by building. As of today, the Dean's Office has received less than 20 requests by faculty to access their offices and labs, and many of these already had access at level 4 or 5. At a meeting of the Heads yesterday, it was decided that the Acting Dean would request that VPC look at allowing graduate students and postdoctoral fellows access to campus sooner. Receipt of the memo was acknowledged by the VPA and I am sure it will be given full consideration by VPC.

## **FSC 2763 Question Period**

The committee working on the course equivalencies had not considered a window with which supervisory credits could be used. The two-year window within which the credits could be used meant to limit long term banking of supervisory credits. This will be resolved once the committee completes its work.

The Fall 2020 semester will be a strictly remote-only semester, but there will probably be an opportunity for those Honours students who have to be on campus to be given that permission. The communication to students about this must be very clear and the university has to focus on getting that message out to everyone.

Laboratory instruction is a departmental issue, and, as such, departments have the responsibility to work out the remote delivery of labs. There will be specific challenges for specific labs, such as liability issues or first aid requirements. The Acting Dean will communicate to everyone any information he receives regarding these issues.

**FSC 2764**

**Adjournment**

The meeting adjourned at 1:54 p.m.



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St. John's, NL Canada A1C 5S7  
Tel: 709 864 8260 Fax: 709 864 2337  
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July 6, 2020

TO: All Members of Faculty Council, Faculty of Science

FROM: Tracey Edmunds, Secretary, Committee on Undergraduate Studies  
Faculty of Science

SUBJECT: **Proposals for Calendar Changes**

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An email poll meeting held on June 26<sup>th</sup>, 2020, the Faculty of Science Committee on Undergraduate Studies approved a proposal for a New Course from the Department of Biology, and agreed that the following items should be forwarded to Faculty Council for approval:

1. Department of Biology - New Course: Biology 3630 - Freshwater Biology

*Tracey Edmunds*

---

Tracey Edmunds

# Memorial University of Newfoundland

## Undergraduate Calendar Change Proposal Form

### Cover Page

#### LIST OF CHANGES

Indicate the Calendar change(s) being proposed by checking and completing as appropriate:

- ☒ New course(s):
- ☐ Amended or deleted course(s):
- ☐ New program(s):
- ☐ Amended or deleted program(s):
- ☐ New, amended or deleted Glossary of Terms Used in the Calendar entries
- ☐ New, amended or deleted Admission/Readmission to the University (Undergraduate) regulations
- ☐ New, amended or deleted General Academic Regulations (Undergraduate)
- ☐ New, amended or deleted Faculty, School or Departmental regulations
- ☐ Other:

#### ADMINISTRATIVE AUTHORIZATION

By signing below, you are confirming that the attached Calendar changes have obtained all necessary Faculty/School approvals, and that the costs, if any, associated with these changes can be met from within the existing budget allocation or authorized new funding for the appropriate academic unit.

Signature of Dean/Vice-President: \_\_\_\_\_

Date: \_\_\_\_\_

Date of approval by Faculty/Academic Council: \_\_\_\_\_

# Memorial University of Newfoundland

## Undergraduate Calendar Change Proposal Form

### Senate Summary Page for Courses

#### COURSE NUMBER AND TITLE

Biology 3630 – Freshwater Biology

#### REVISED COURSE NUMBER AND TITLE

NA

#### ABBREVIATED COURSE TITLE

Freshwater Biology

#### RATIONALE

The study of freshwater biology has wide ranging significance with applications from basic science to economic and management considerations. This course will provide students at Memorial University with a solid understanding of how to collect, analyze, interpret, and report limnological data.

The proposed course was last offered in 1984 and deleted from the Calendar shortly thereafter. The recent hiring of a new faculty member within the Department of Biology will allow the department to once again offer this highly relevant course.

The proposed course will be a useful elective for the various programs offered by the Department of Biology, particularly for those students pursuing the Aquatic Life Concentration. Currently, there is no other course offered at the St. John's campus of Memorial University that focuses on freshwater biology.

#### CALENDAR CHANGES

##### 12.2 Biology

According to the nature of particular courses, the specified number of laboratory hours may consist of some combination of laboratory work, seminars or directed independent study relevant to the practical aspects of the subject matter.

Biology courses are designated by BIOL.

**3630 Freshwater Biology** is the study of the physical, chemical and biological aspects of the freshwater habitat. Topics will include morphometry, light and temperature, water chemistry in relation to nutrients, physiological requirements, composition and interaction of algal and invertebrate populations. Eutrophication, pollution, and environmental changes will also be covered.



CR: ENVS 3130

LH: 3

PR: Science 1807 and Science 1808; BIOL 2600

## **CALENDAR ENTRY AFTER CHANGES**

### **12.2 Biology**

According to the nature of particular courses, the specified number of laboratory hours may consist of some combination of laboratory work, seminars or directed independent study relevant to the practical aspects of the subject matter.

Biology courses are designated by BIOL.

**3630 Freshwater Biology** is the study of the physical, chemical and biological aspects of the freshwater habitat. Topics will include morphometry, light and temperature, water chemistry in relation to nutrients, physiological requirements, composition and interaction of algal and invertebrate populations. Eutrophication, pollution, and environmental changes will also be covered.

CR: ENVS 3130

LH: 3

PR: Science 1807 and Science 1808; BIOL 2600

## **SECONDARY CALENDAR CHANGES**

### **13.13 Environmental Science**

Environmental Science courses are designated by ENVS.

#### **13.13.1 Environmental Biology**

**3130 Freshwater Ecology** is the study of freshwater ecosystems (lakes, rivers, streams, peatlands). Included are abiotic components, community structures, energy flow, biogeochemical cycles, and the evolution of natural and altered aquatic ecosystems. Emphasis will be placed on field and laboratory studies of the ecology of freshwater organisms and systems in western Newfoundland.

CR: BIOL 3630

LH: 3

PR: Biology 2010, Biology 2122, Biology 2600; one of Chemistry 1001 or the former Chemistry 1011; Science 1807 and Science 1808

# Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

## CONSULTATIONS SOUGHT

Academic Unit	Response
Humanities and Social Sciences	No
Business Administration	No
Education	No
Engineering and Applied Science	Yes
<b>Grenfell Campus:</b> Arts and Social Science Science and the Environment (ENVS)	No Yes
Human Kinetics and Recreation	Yes
Marine Institute	No
Medicine	Yes
Music	Yes
Nursing	No
Pharmacy	Yes
<b>Science</b> Ocean Science Psychology	Yes Yes
Social Work	No
Library	No

## **LIBRARY REPORT**

A library report is attached.

## **RESOURCE IMPLICATIONS**

This course will be taught by an existing faculty member in the Department of Biology with expertise in freshwater biology. No additional instructional costs will be required.

## **ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS**

### **Proposed Course Outline**

Biology 3630 will cover the physics, chemistry, and biology of freshwater lakes. Emphasis on: morphometry; light and temperature; water chemistry in relation to nutrients; physiological requirements; composition and interaction of algal and invertebrate populations; eutrophication; pollution; environmental change.

### **Educational objectives:**

- Learn the basic terminology used by limnologists and other aquatic scientists
- Learn and integrate multidisciplinary concepts to understand how aquatic systems function.
- Develop an understanding of how living organisms survive and interact in aquatic environments.
- Learn to identify common aquatic organisms, particularly algae, zooplankton, and macroinvertebrates.
- Learn how to collect, analyze, interpret, and report limnological data. This includes learning to critically read, with an understanding of salient points, original research articles relating to freshwater ecology.
- Become exposed to communication of science using examples from freshwater biology.

### **Lecture Topics**

- Origin of lakes
- Physical limnology
  - Lake morphometry and zones
  - Light in lakes
  - Heat in lakes
  - Water movement
- Chemical limnology
  - Oxygen
  - Salinity
  - Carbon
  - Nitrogen
  - Phosphorus
  - Sulfur and silica
- Biological limnology
  - Phytoplankton and primary production
  - Plants and macrophytes
  - Zooplankton
  - Benthos
  - Fish and trophic interactions

- Integrative limnology and applications
  - Paleolimnology
  - Acidification
  - Lake Remediation
  - Contaminants
  - Invasive species
  - Climate change
  - Multiple stressors

### Evaluation

- |                           |     |
|---------------------------|-----|
| • Midterm I*              | 10% |
| • Midterm II              | 15% |
| • Online quizzes (5 x 1%) | 5%  |
| ○ Participation in class  | 5%  |
| • Assignments (5% each)   | 15% |
| ○ Literature critique I*  |     |
| ○ Citizen science program |     |
| ○ Literature critique II  |     |
| • Labs                    | 30% |
| ○ Reports*                |     |
| ○ Bell ringer exam        |     |
| • Final exam (cumulative) | 20% |

*\*Marks for this assessment will be returned before the last day to drop courses without academic prejudice. (Total assessment before drop date: 23% (10% + 5% + 8%))*

### Labs

The class will be split into two lab sections with each lab section occurring every other week.

- Lab 1: Lake models (stratification)\* (8%)
- Lab 2: Field sampling (in 3 hr slot, likely at campus pond, alternatively, could be a Saturday ~5 hr commitment to go somewhere nicer)
- Lab 3: Microscopy and biological limnology
- Lab 4: Paleolimnology\* (12%)
- Lab 5: Microcosms
- Lab 6: Bell ringer exam (10%)

*\*These labs have lab report write ups due at the start of the next lab*

### Textbook

Limnology, 3<sup>rd</sup> Edition: Lake and River Ecosystems. Robert Wetzel. Academic Press, Elsevier.  
This text has an eBook option.

A number of scientific journal articles relevant to the material presented in the course will be posted on the course Brightspace webpage in PDF format. These papers will also be available through Memorial's library system.

## Modifications to Course for Remote Learning due to Covid-19

Each lecture topic will each be delivered in one to two 10-15 minute long videos.

The midterm and final exam will be take home (i.e. open book), with ~4 different versions of the midterm and final exam distributed to the class. A greater mark emphasis will be allotted to assignments with one additional assignment incorporated into the course. The bell ringer component of the lab mark is removed and instead students will have to complete a taxonomical assignment on an assigned freshwater species.

Remote evaluation:

- |                                     |     |
|-------------------------------------|-----|
| • Take home Midterm*                | 10% |
| • Online quizzes (5 x 2%)           | 10% |
| • Assignments (7.5% each)           | 30% |
| ○ Literature critique I*            |     |
| ○ Citizen science program           |     |
| ○ Literature critique II            |     |
| ○ Presentation                      |     |
| • Labs* (5 x 6% each)               | 30% |
| ○ Lake stratification <sup>+</sup>  |     |
| ○ Water quality <sup>+</sup>        |     |
| ○ Biological limnology              |     |
| ○ Algal blooms <sup>+</sup>         |     |
| ○ Paleolimnology <sup>+</sup>       |     |
| ○ Microcosms <sup>+</sup>           |     |
| ○ <i>Lab reports</i>                |     |
| • Take-home Final exam (cumulative) | 20% |

*\*Marks for this assessment will be returned before the last day to drop courses without academic prejudice. (Total assessment before drop date: 23.5% (10% + 7.5% + 6%))*

Labs will be demonstrated by the instructor and teaching assistants over video. The data from these demonstrations will be shared with the class to analyse and interpret. Unfortunately, with remote learning the hands-on field experience for lake sampling will not be possible. Nor will microscopy laboratories. We will explore filming microscope specimens and compile microscope videos available online of live plankton.

### Instructor

Kathryn E. Hargan, Ph.D.

Assistant Professor, Department of Biology

Email: [khargan@mun.ca](mailto:khargan@mun.ca)

## Jody-Lynn Burke

---

**From:** Engineering Consult <engrconsult@mun.ca>  
**Sent:** Wednesday, June 17, 2020 1:57 PM  
**To:** Jody-Lynn Burke  
**Cc:** Edmunds, Jayde; Peters, Dennis; Bruce Quinton  
**Subject:** Re: Calendar Change Proposal - BIOL

**Importance:** High

Dear Ms. Burke,

Thank you for the opportunity to comment on the proposed revival of Biology 3630 "Freshwater Biology"

At today's meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science, the Committee found no impact on Engineering programs. We are happy to support these proposed changes.

Yours sincerely,

Dr. Glyn George, Chair  
 Committee on Undergraduate Studies  
 Faculty of Engineering and Applied Science Memorial University of Newfoundland  
 St. John's NL A1B 3X5  
 -----

On 2020-06-09 14:24, Jody-Lynn Burke wrote:

> Dear colleagues,  
 >  
 > I hope you're all doing well during these unprecedented times.  
 >  
 > The purpose of this email is to extend an opportunity for you to  
 > provide feedback on the attached calendar change proposal for BIOL  
 > 3630.  
 >  
 > We hope to offer this course in the Fall. Your feedback, at your  
 > earliest convenience, is appreciated.  
 >  
 > If you have any questions, please don't hesitate to contact me.  
 >  
 > Be well and stay safe!  
 >  
 > JODY BURKE, BSC.(HONS), M.ED, PGC(QM) – ACADEMIC PROGRAM OFFICER  
 >  
 > Department of Biology, Memorial University  
 >  
 > Office: (709) 864 8021  
 >  
 > E-mail: jodyb@mun.ca

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## Jody-Lynn Burke

---

**From:** Annie Mercier <amercier@mun.ca>  
**Sent:** Wednesday, June 17, 2020 9:25 AM  
**To:** jodyb@mun.ca  
**Subject:** Re: FW: Calendar Change Proposal - BIOL

Hi Jody:

Our undergrad studies committee reviewed the proposed course and we all found it quite interesting and well designed; it should make a nice addition to your curriculum. Some very minor notes:

- You may not need to abbreviate the course title (it seems to be brief enough).
- There seems to be a word missing in the calendar description right after the course title: 3630 Freshwater Biology a study of ... Do you mean: 3630 Freshwater Biology **is/proposes** a study of ...?
- I believe the recent calendar style calls for descriptions to be in the present tense.

Good luck with the remote offering of the course this coming fall.

All the best,

Annie

---

Annie Mercier, PhD  
 Professor and Deputy Head  
 Department of Ocean Sciences  
 Memorial University  
 709-864-2011  
[amercier@mun.ca](mailto:amercier@mun.ca)

On 2020-06-09 2:32 p.m., Dean of Science wrote:

Please reply directly to Jody Burke with any input. Thank you.

Gail

---

**From:** Jody-Lynn Burke  
**Sent:** Tuesday, June 9, 2020 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <[hss@mun.ca](mailto:hss@mun.ca)>; Shannahan, Rachelle <[rshannahan@mun.ca](mailto:rshannahan@mun.ca)>; Collett, Meghan <[mcollett@mun.ca](mailto:mcollett@mun.ca)>; engrconsult@mun.ca; Rohr, Linda <[lerohr@mun.ca](mailto:lerohr@mun.ca)>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D <[isutherland@mun.ca](mailto:isutherland@mun.ca)>; DeanNurse <[DeanNurse@mun.ca](mailto:DeanNurse@mun.ca)>; pharminfo@mun.ca; Dean of Science <[deansci@mun.ca](mailto:deansci@mun.ca)>; adeanugradswk <[adeanugradswk@mun.ca](mailto:adeanugradswk@mun.ca)>; Library Correspondence <[univlib@mun.ca](mailto:univlib@mun.ca)>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca  
**Cc:** sdufour@mun.ca; Sullivan, Shannon <[shannon@mun.ca](mailto:shannon@mun.ca)>  
**Subject:** Calendar Change Proposal - BIOL  
**Importance:** High



Dear colleagues,

I hope you're all doing well during these unprecedented times.

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposal for BIOL 3630.

We hope to offer this course in the Fall. Your feedback, at your earliest convenience, is appreciated.

If you have any questions, please don't hesitate to contact me.

Be well and stay safe!

**Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer**

Department of Biology, Memorial University

Office: (709) 864 8021

E-mail: [jodyb@mun.ca](mailto:jodyb@mun.ca)



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## Jody-Lynn Burke

---

**From:** Rohr, Linda  
**Sent:** Monday, June 15, 2020 3:12 PM  
**To:** Jody-Lynn Burke  
**Subject:** Re: Calendar Change Proposal - BIOL

Hi Jody,

No concern from HKR for the proposed course from Biology.

Linda

**Linda E. Rohr** PhD  
 Dean, School of Human Kinetics & Recreation  
 Memorial University  
 t: 709.864.8129 f: 709.864.7531 e: [lerohr@mun.ca](mailto:lerohr@mun.ca)  
 PE 2027

---

**From:** Jody-Lynn Burke <jrotchford@mun.ca>  
**Date:** Tuesday, June 9, 2020 at 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <hss@mun.ca>, "Shannahan, Rachelle" <rshannahan@mun.ca>, "Collett, Meghan" <mcollett@mun.ca>, "engrconsult@mun.ca" <engrconsult@mun.ca>, Linda Rohr <lerohr@mun.ca>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>, "deanofmedicine@med.mun.ca" <deanofmedicine@med.mun.ca>, "Sutherland, Ian D" <isutherland@mun.ca>, DeanNurse <DeanNurse@mun.ca>, "pharminfo@mun.ca" <pharminfo@mun.ca>, Dean of Science <deansci@mun.ca>, adeanugradswk <adeanugradswk@mun.ca>, Library Correspondence <univlib@mun.ca>, "kjacobs@grenfell.mun.ca" <kjacobs@grenfell.mun.ca>, "ssedean@grenfell.mun.ca" <ssedean@grenfell.mun.ca>, "thennessey@grenfell.mun.ca" <thennessey@grenfell.mun.ca>  
**Cc:** "sdufour@mun.ca" <sdufour@mun.ca>, "Sullivan,Shannon" <shannon@mun.ca>  
**Subject:** Calendar Change Proposal - BIOL

Dear colleagues,

I hope you're all doing well during these unprecedented times.

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposal for BIOL 3630.

We hope to offer this course in the Fall. Your feedback, at your earliest convenience, is appreciated.

If you have any questions, please don't hesitate to contact me.

Be well and stay safe!

**Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer**  
 Department of Biology, Memorial University  
 Office: (709) 864 8021

E-mail: [jodyb@mun.ca](mailto:jodyb@mun.ca)



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## Jody-Lynn Burke

---

**From:** Bishop, Lisa <ldbishop@mun.ca>  
**Sent:** Thursday, June 11, 2020 3:54 PM  
**To:** jodyb@mun.ca  
**Cc:** Glew, Csop  
**Subject:** Re: Calendar Change Proposal - BIOL

Hi Jody,  
 Thank you for the opportunity to provide feedback. We have no concerns from pharmacy.

Lisa

Dr. Lisa D. Bishop, BScPharm, ACPR, Pharm D, FCSHP | Associate Professor and Acting Associate Dean of Undergraduate Studies

School of Pharmacy  
 Clinical Assistant Professor, Discipline of Family Medicine, Faculty of Medicine  
 Memorial University of Newfoundland  
 Health Sciences Centre  
 300 Prince Philip Drive  
 St. John's, NL | A1B 3V6  
 T 709 864-8469 | F 709 864-6941

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---

**From:** Jody-Lynn Burke [<mailto:jrotchford@mun.ca>]  
**Sent:** Tuesday, June 9, 2020 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <[hss@mun.ca](mailto:hss@mun.ca)>; Shannahan, Rachelle <[rshannahan@mun.ca](mailto:rshannahan@mun.ca)>; Collett, Meghan <[mcollett@mun.ca](mailto:mcollett@mun.ca)>; [engrconsult@mun.ca](mailto:engrconsult@mun.ca); Rohr, Linda <[lerohr@mun.ca](mailto:lerohr@mun.ca)>; [miugconsultations@mi.mun.ca](mailto:miugconsultations@mi.mun.ca); [deanofmedicine@med.mun.ca](mailto:deanofmedicine@med.mun.ca); Sutherland, Ian D <[isutherland@mun.ca](mailto:isutherland@mun.ca)>; DeanNurse <[DeanNurse@mun.ca](mailto:DeanNurse@mun.ca)>; [pharminfo@mun.ca](mailto:pharminfo@mun.ca); Dean of Science <[deansci@mun.ca](mailto:deansci@mun.ca)>; [adeanugradswk@mun.ca](mailto:adeanugradswk@mun.ca); Library Correspondence <[univlib@mun.ca](mailto:univlib@mun.ca)>; [kjacobse@grenfell.mun.ca](mailto:kjacobse@grenfell.mun.ca); [ssedean@grenfell.mun.ca](mailto:ssedean@grenfell.mun.ca); [thennessey@grenfell.mun.ca](mailto:thennessey@grenfell.mun.ca)  
**Cc:** [sdufour@mun.ca](mailto:sdufour@mun.ca); Sullivan, Shannon <[shannon@mun.ca](mailto:shannon@mun.ca)>  
**Subject:** Calendar Change Proposal - BIOL  
**Importance:** High

Dear colleagues,

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We hope to offer this course in the Fall. Your feedback, at your earliest convenience, is appreciated.

If you have any questions, please don't hesitate to contact me.

Be well and stay safe!

**Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer**

Department of Biology, Memorial University

Office: (709) 864 8021

E-mail: [jodyb@mun.ca](mailto:jodyb@mun.ca)



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## Jody-Lynn Burke

---

**From:** Sutherland, Ian D  
**Sent:** Wednesday, June 10, 2020 10:34 AM  
**To:** Jody-Lynn Burke  
**Subject:** Re: Calendar Change Proposal - BIOL

The School of Music has no issue with the proposed new course.

.....  
 IAN SUTHERLAND, PhD (Exon) | DEAN

School of Music  
 Memorial University  
 St. John's, Newfoundland  
 T 709 864 7486

[www.mun.ca/music](http://www.mun.ca/music) | [www.facebook.com/musicatmun/](https://www.facebook.com/musicatmun/) | [@musicschooldean](https://www.instagram.com/musicschooldean) | [@musicatmemorial](https://www.instagram.com/musicatmemorial) |

---

**From:** Jody-Lynn Burke <jrotchford@mun.ca>  
**Date:** Tuesday, June 9, 2020 at 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <hss@mun.ca>, "Shannahan, Rachelle" <rshannahan@mun.ca>, "Collett, Meghan" <mcollett@mun.ca>, "engrconsult@mun.ca" <engrconsult@mun.ca>, "Rohr, Linda" <lerohr@mun.ca>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>, "deanofmedicine@med.mun.ca" <deanofmedicine@med.mun.ca>, "Sutherland, Ian D" <isutherland@mun.ca>, DeanNurse <DeanNurse@mun.ca>, "pharminfo@mun.ca" <pharminfo@mun.ca>, Dean of Science <deansci@mun.ca>, adeanugradswk <adeanugradswk@mun.ca>, Library Correspondence <univlib@mun.ca>, "kjacobse@grenfell.mun.ca" <kjacobse@grenfell.mun.ca>, "ssedean@grenfell.mun.ca" <ssedean@grenfell.mun.ca>, "thennessey@grenfell.mun.ca" <thennessey@grenfell.mun.ca>  
**Cc:** "sdufour@mun.ca" <sdufour@mun.ca>, "Sullivan, Shannon" <shannon@mun.ca>  
**Subject:** Calendar Change Proposal - BIOL

Dear colleagues,

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Be well and stay safe!

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## Jody-Lynn Burke

---

**From:** Hyde, Cathy  
**Sent:** Tuesday, June 9, 2020 2:55 PM  
**To:** Jody-Lynn Burke  
**Subject:** RE: Calendar Change Proposal - BIOL

Hi,

My thought is that we should leave it as is for this year and gauge interest, then perhaps next year we can look into something more formal if required. Having said that, I finish up in this role on Monday (going to CS full-time) so I probably shouldn't be making any decisions for the Psychology department! ☺ I have a meeting with the deputy head tomorrow so I'll discuss it with her and will let you know.

### Cathy Hyde, MSc | Manager of Academic Programs, MSc

Departments of Computer Science and Psychology

Memorial University of Newfoundland

Tel: (709) 864-3059

[www.mun.ca/computerscience/](http://www.mun.ca/computerscience/)

[www.mun.ca/psychology/](http://www.mun.ca/psychology/)

---

**From:** Jody-Lynn Burke <jrotchford@mun.ca>  
**Sent:** Tuesday, June 9, 2020 2:50 PM  
**To:** Hyde, Cathy <cathy@mun.ca>  
**Subject:** RE: Calendar Change Proposal - BIOL

Hi Cathy,

The course would be reserved for the first two weeks of registration for our Majors and Minor (per usual). After that, any student who meet the pre-reqs will be able to register as long as seats are available.

I think this course could be a good fit as a second lab course. Is PSYC interested in a more formal arrangement where we reserve a certain number of spots for your students?

### Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer

Department of Biology, Memorial University

Office: (709) 864 8021

E-mail: [jodyb@mun.ca](mailto:jodyb@mun.ca)



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**From:** Hyde, Cathy <[cathy@mun.ca](mailto:cathy@mun.ca)>  
**Sent:** Tuesday, June 9, 2020 2:46 PM  
**To:** Jody-Lynn Burke <[jrotchford@mun.ca](mailto:jrotchford@mun.ca)>  
**Subject:** FW: Calendar Change Proposal - BIOL  
**Importance:** High

Hi Jody,

It looks like a great course! Quite a few of our B.Sc. Psychology majors choose to do BIOL 2600 as one of their lab courses. I notice that 2600 is the prerequisite for this new course which makes me think some of our students may be interested in taking this new course as their second lab course. What are your thoughts on that? Would you view this as a good thing, or is this course aimed at Biology majors and minors? Thanks,

**Cathy Hyde, MSc | Manager of Academic Programs, MSc**

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[www.mun.ca/psychology/](http://www.mun.ca/psychology/)

---

**From:** Dean of Science <[deansci@mun.ca](mailto:deansci@mun.ca)>  
**Sent:** Tuesday, June 9, 2020 2:33 PM  
**To:** Amina Ahmed Mahmood <[aamahmood@mun.ca](mailto:aamahmood@mun.ca)>; Todd, Amy M. <[amy.todd@mun.ca](mailto:amy.todd@mun.ca)>; BiocDHundergrad <[biocdhundergrad@mun.ca](mailto:biocdhundergrad@mun.ca)>; Hyde, Cathy <[cathy@mun.ca](mailto:cathy@mun.ca)>; Chemistry <[chemconsult@mun.ca](mailto:chemconsult@mun.ca)>; Computer Science consultation <[compsci@mun.ca](mailto:compsci@mun.ca)>; Earth Sciences <[eascugcon@mun.ca](mailto:eascugcon@mun.ca)>; James Munroe <[jmunroe@mun.ca](mailto:jmunroe@mun.ca)>; Math & Stats <[mathconsult@mun.ca](mailto:mathconsult@mun.ca)>; Ocean Sciences <[amercier@mun.ca](mailto:amercier@mun.ca)>; Goulding, Rick <[rgoulding@mun.ca](mailto:rgoulding@mun.ca)>; Psychology consult <[psychdeputyhead@mun.ca](mailto:psychdeputyhead@mun.ca)>; Newhook, Rebecca <[rnewhook@mun.ca](mailto:rnewhook@mun.ca)>; Sharene Bungay <[sharene@mun.ca](mailto:sharene@mun.ca)>; Suzanne Dufour <[sdufour@mun.ca](mailto:sdufour@mun.ca)>; Mackenzie, Theresa <[tmackenz@mun.ca](mailto:tmackenz@mun.ca)>; Oscar Meruvia-Pastor <[oscar@mun.ca](mailto:oscar@mun.ca)>  
**Subject:** FW: Calendar Change Proposal - BIOL  
**Importance:** High

Please reply directly to Jody Burke with any input. Thank you.

Gail

---

**From:** Jody-Lynn Burke  
**Sent:** Tuesday, June 9, 2020 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <[hss@mun.ca](mailto:hss@mun.ca)>; Shannahan, Rachelle <[rshannahan@mun.ca](mailto:rshannahan@mun.ca)>; Collett, Meghan <[mcollett@mun.ca](mailto:mcollett@mun.ca)>; engrconsult@mun.ca; Rohr, Linda <[lerohr@mun.ca](mailto:lerohr@mun.ca)>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D <[isutherland@mun.ca](mailto:isutherland@mun.ca)>; DeanNurse <[DeanNurse@mun.ca](mailto:DeanNurse@mun.ca)>; pharminfo@mun.ca; Dean of Science <[deansci@mun.ca](mailto:deansci@mun.ca)>; adeanugradswk <[adeanugradswk@mun.ca](mailto:adeanugradswk@mun.ca)>; Library Correspondence <[univlib@mun.ca](mailto:univlib@mun.ca)>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca  
**Cc:** [sdufour@mun.ca](mailto:sdufour@mun.ca); Sullivan, Shannon <[shannon@mun.ca](mailto:shannon@mun.ca)>  
**Subject:** Calendar Change Proposal - BIOL  
**Importance:** High

Dear colleagues,

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The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposal for BIOL 3630.

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If you have any questions, please don't hesitate to contact me.

Be well and stay safe!

**Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer**

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E-mail: [jodyb@mun.ca](mailto:jodyb@mun.ca)



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## Jody-Lynn Burke

---

**From:** cvardy@mun.ca  
**Sent:** Tuesday, June 9, 2020 2:47 PM  
**To:** Jody-Lynn Burke  
**Cc:** DeanofMedicine@med.mun.ca  
**Subject:** FW: Calendar Change Proposal - BIOL  
**Attachments:** New Course - BIOL 3630.pdf  
  
**Importance:** High

Good afternoon

The Faculty of Medicine is supportive of the proposed calendar change concerning BIOL 3630.

Regards,

Cathy Vardy, MD  
 Vice Dean  
 Faculty of Medicine

---

**From:** Jody-Lynn Burke [<mailto:jrotchford@mun.ca>]  
**Sent:** Tuesday, June 9, 2020 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <[hss@mun.ca](mailto:hss@mun.ca)>; Shannahan, Rachelle <[rshannahan@mun.ca](mailto:rshannahan@mun.ca)>; Collett, Meghan <[mcollett@mun.ca](mailto:mcollett@mun.ca)>; [engrconsult@mun.ca](mailto:engrconsult@mun.ca); Rohr, Linda <[lerohr@mun.ca](mailto:lerohr@mun.ca)>; [miugconsultations@mi.mun.ca](mailto:miugconsultations@mi.mun.ca); Steele, Dr. Margaret: Dean of Medicine <[DeanofMedicine@med.mun.ca](mailto:DeanofMedicine@med.mun.ca)>; Sutherland, Ian D <[isutherland@mun.ca](mailto:isutherland@mun.ca)>; DeanNurse <[DeanNurse@mun.ca](mailto:DeanNurse@mun.ca)>; [pharminfo@mun.ca](mailto:pharminfo@mun.ca); Dean of Science <[deansci@mun.ca](mailto:deansci@mun.ca)>; adeanugradswk <[adeanugradswk@mun.ca](mailto:adeanugradswk@mun.ca)>; Library Correspondence <[univlib@mun.ca](mailto:univlib@mun.ca)>; [kjacobse@grenfell.mun.ca](mailto:kjacobse@grenfell.mun.ca); [ssedean@grenfell.mun.ca](mailto:ssedean@grenfell.mun.ca); [thennessey@grenfell.mun.ca](mailto:thennessey@grenfell.mun.ca)  
**Cc:** [sdufour@mun.ca](mailto:sdufour@mun.ca); Sullivan, Shannon <[shannon@mun.ca](mailto:shannon@mun.ca)>  
**Subject:** Calendar Change Proposal - BIOL  
**Importance:** High

Dear colleagues,

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Be well and stay safe!

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## Jody-Lynn Burke

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**From:** Hyde, Cathy  
**Sent:** Tuesday, June 9, 2020 2:46 PM  
**To:** Jody-Lynn Burke  
**Subject:** FW: Calendar Change Proposal - BIOL  
**Attachments:** New Course - BIOL 3630.pdf

**Importance:** High

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[www.mun.ca/psychology/](http://www.mun.ca/psychology/)

---

**From:** Dean of Science <deansci@mun.ca>  
**Sent:** Tuesday, June 9, 2020 2:33 PM  
**To:** Amina Ahmed Mahmood <aamahmood@mun.ca>; Todd, Amy M. <amy.todd@mun.ca>; BiocDHundergrad <biocdhundergrad@mun.ca>; Hyde, Cathy <cathy@mun.ca>; Chemistry <chemconsult@mun.ca>; Computer Science consultation <compsci@mun.ca>; Earth Sciences <eascugcon@mun.ca>; James Munroe <jmunroe@mun.ca>; Math & Stats <mathconsult@mun.ca>; Ocean Sciences <amercier@mun.ca>; Goulding, Rick <rgoulding@mun.ca>; Psychology consult <psychdeputyhead@mun.ca>; Newhook, Rebecca <rnewhook@mun.ca>; Sharene Bungay <sharene@mun.ca>; Suzanne Dufour <sdufour@mun.ca>; Mackenzie, Theresa <tmackenz@mun.ca>; Oscar Meruvia-Pastor <oscar@mun.ca>  
**Subject:** FW: Calendar Change Proposal - BIOL  
**Importance:** High

Please reply directly to Jody Burke with any input. Thank you.

Gail

---

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**Sent:** Tuesday, June 9, 2020 2:24 PM  
**To:** Faculty of Humanities and Social Sciences <[hss@mun.ca](mailto:hss@mun.ca)>; Shannahan, Rachelle <[rshannahan@mun.ca](mailto:rshannahan@mun.ca)>; Collett, Meghan <[mcollett@mun.ca](mailto:mcollett@mun.ca)>; [engrconsult@mun.ca](mailto:engrconsult@mun.ca); Rohr, Linda <[lerohr@mun.ca](mailto:lerohr@mun.ca)>; [miugconsultations@mi.mun.ca](mailto:miugconsultations@mi.mun.ca); [deanofmedicine@med.mun.ca](mailto:deanofmedicine@med.mun.ca); Sutherland, Ian D <[isutherland@mun.ca](mailto:isutherland@mun.ca)>; DeanNurse <[DeanNurse@mun.ca](mailto:DeanNurse@mun.ca)>; [pharminfo@mun.ca](mailto:pharminfo@mun.ca); Dean of Science <[deansci@mun.ca](mailto:deansci@mun.ca)>; adeanugradswk <[adeanugradswk@mun.ca](mailto:adeanugradswk@mun.ca)>; Library Correspondence <[univlib@mun.ca](mailto:univlib@mun.ca)>; [kjacobse@grenfell.mun.ca](mailto:kjacobse@grenfell.mun.ca); [ssedean@grenfell.mun.ca](mailto:ssedean@grenfell.mun.ca); [thennessey@grenfell.mun.ca](mailto:thennessey@grenfell.mun.ca)  
**Cc:** [sdufour@mun.ca](mailto:sdufour@mun.ca); Sullivan, Shannon <[shannon@mun.ca](mailto:shannon@mun.ca)>  
**Subject:** Calendar Change Proposal - BIOL  
**Importance:** High

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**Jody-Lynn Burke**

---

**From:** Dean - School of Science and the Environment <ssedean@grenfell.mun.ca>  
**Sent:** Tuesday, June 23, 2020 10:59 AM  
**To:** Jody-Lynn Burke  
**Subject:** Re: Calendar Change Proposal - BIOL

Hello Jody-Lynn,

Thank-you for the opportunity to comment on the new biology course. It has been suggested that our course (ENVS 3130) and the proposed new course (BIOL 3630) be credit restricted because they are very similar. I've pasted the response from our Environmental Science program below.

Best wishes,  
 Michele

Response from Environmental Science program:

Please see the note below from Christine regarding the extensive overlap between this proposed biology course (BIOL 3630) and ENVS 3130. They are extremely similar and so should be credit restricted, which will also require a secondary change to the Grenfell/ENVS portion of the calendar to indicate the same circumstance in the calendar listing for ENVS 3130 (which I've copied here).

Calendar description Envs 3130

ENVS 3130 Freshwater Ecology is the study of freshwater ecosystems (lakes, rivers, streams, peatlands). Included are abiotic components, community structures, energy flow, biogeochemical cycles, and the evolution of natural and altered aquatic ecosystems. Emphasis will be placed on field and laboratory studies of the ecology of freshwater organisms and systems in western Newfoundland.

LH: 3

PR: Biology 2010, Biology 2122, Biology 2600; one of Chemistry 1001 or

Chemistry 1011; Science 1807

Hi,  
 This course Freshwater Biology needs to be CREDIT-RESTRICTED with Envs 3130 Freshwater Ecology. They are both courses in limnology that cover mainly the same material in lecture and lab.

---

**From:** Jody-Lynn Burke <jrotchford@mun.ca>  
**Sent:** Tuesday, June 9, 2020 4:54 PM  
**To:** Faculty of Humanities and Social Sciences <hss@mun.ca>; Shannahan, Rachelle <rshannahan@mun.ca>; Collett, Meghan <mcollett@mun.ca>; engrconsult@mun.ca <engrconsult@mun.ca>; Rohr, Linda <lrohr@mun.ca>; MIUG

Consultations <MIUGconsultations@mi.mun.ca>; deanofmedicine@med.mun.ca <deanofmedicine@med.mun.ca>; Sutherland, Ian D <isutherland@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca <pharminfo@mun.ca>; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>; Jacobsen, Ken <kjacobse@grenfell.mun.ca>; Dean - School of Science and the Environment <ssedean@grenfell.mun.ca>; Hennessey, Todd <THENNESSEY@grenfell.mun.ca>  
**Cc:** sdufour@mun.ca <sdufour@mun.ca>; Sullivan, Shannon <shannon@mun.ca>  
**Subject:** Calendar Change Proposal - BIOL

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Department of Biology, Memorial University

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E-mail: [jodyb@mun.ca](mailto:jodyb@mun.ca)



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# Memorial University of Newfoundland

## Undergraduate Calendar Change Proposal Form

### Cover Page

#### LIST OF CHANGES

Indicate the Calendar change(s) being proposed by checking and completing as appropriate:

- ☒ New course(s):
- ☐ Amended or deleted course(s):
- ☐ New program(s):
- ☐ Amended or deleted program(s):
- ☐ New, amended or deleted Glossary of Terms Used in the Calendar entries
- ☐ New, amended or deleted Admission/Readmission to the University (Undergraduate) regulations
- ☐ New, amended or deleted General Academic Regulations (Undergraduate)
- ☐ New, amended or deleted Faculty, School or Departmental regulations
- ☐ Other:

#### ADMINISTRATIVE AUTHORIZATION

By signing below, you are confirming that the attached Calendar changes have obtained all necessary Faculty/School approvals, and that the costs, if any, associated with these changes can be met from within the existing budget allocation or authorized new funding for the appropriate academic unit.

Signature of Dean/Vice-President: \_\_\_\_\_

Date: \_\_\_\_\_

Date of approval by Faculty/Academic Council: \_\_\_\_\_

# **Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Senate Summary Page for Courses**

## **COURSE NUMBER AND TITLE**

Biology 3630 – Freshwater Biology

## **REVISED COURSE NUMBER AND TITLE**

NA

## **ABBREVIATED COURSE TITLE**

Freshw. Biology

## **RATIONALE**

The study of freshwater biology has wide ranging significance with applications from basic science to economic and management considerations. This course will provide students at Memorial University with a solid understanding of how to collect, analyze, interpret, and report limnological data.

The proposed course was last offered in 1984 and deleted from the Calendar shortly thereafter. The recent hiring of a new faculty member within the Department of Biology will allow the department to once again offer this highly relevant course.

The proposed course will be a useful elective for the various programs offered by the Department of Biology, particularly for those students pursuing the Aquatic Life Concentration. Currently, there is no other course offered at the St. John's campus of Memorial University that focuses on freshwater biology.

## **CALENDAR CHANGES**

### **12.2 Biology**

According to the nature of particular courses, the specified number of laboratory hours may consist of some combination of laboratory work, seminars or directed independent study relevant to the practical aspects of the subject matter.

Biology courses are designated by BIOL.

**3630 Freshwater Biology** a study of the physical, chemical and biological aspects of the freshwater habitat. Topics will include morphometry, light and temperature, water chemistry in relation to nutrients, physiological requirements, composition and interaction of algal and invertebrate populations. Eutrophication, pollution, and environmental changes will also be covered.

CR: ENVS 3130

LH: 3

PR: Science 1807 and Science 1808; BIOL 2600

## **CALENDAR ENTRY AFTER CHANGES**

### **12.2 Biology**

According to the nature of particular courses, the specified number of laboratory hours may consist of some combination of laboratory work, seminars or directed independent study relevant to the practical aspects of the subject matter.

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**3630 Freshwater Biology** a study of the physical, chemical and biological aspects of the freshwater habitat. Topics will include morphometry, light and temperature, water chemistry in relation to nutrients, physiological requirements, composition and interaction of algal and invertebrate populations. Eutrophication, pollution, and environmental changes will also be covered.

CR: ENVS 3130

LH: 3

PR: Science 1807 and Science 1808; BIOL 2600

## **SECONDARY CALENDAR CHANGES**

### **13.13 Environmental Science**

Environmental Science courses are designated by ENVS.

#### **13.13.1 Environmental Biology**

**3130 Freshwater Ecology** is the study of freshwater ecosystems (lakes, rivers, streams, peatlands). Included are abiotic components, community structures, energy flow, biogeochemical cycles, and the evolution of natural and altered aquatic ecosystems. Emphasis will be placed on field and laboratory studies of the ecology of freshwater organisms and systems in western Newfoundland.

CR: BIOL 3630

LH: 3

PR: Biology 2010, Biology 2122, Biology 2600; one of Chemistry 1001 or the former Chemistry 1011; Science 1807 and Science 1808

# Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

## CONSULTATIONS SOUGHT

Academic Unit	Response
Humanities and Social Sciences	No
Business Administration	No
Education	No
Engineering and Applied Science	Yes
<b>Grenfell Campus:</b> Arts and Social Science Science and the Environment (ENVS)	No Yes
Human Kinetics and Recreation	Yes
Marine Institute	No
Medicine	Yes
Music	Yes
Nursing	No
Pharmacy	Yes
<b>Science</b> Ocean Science Psychology	Yes Yes
Social Work	No
Library	No

## **LIBRARY REPORT**

A library report is attached.

## **RESOURCE IMPLICATIONS**

This course will be taught by an existing faculty member in the Department of Biology with expertise in freshwater biology. No additional instructional costs will be required.

## **ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS**

### **Proposed Course Outline**

Biology 3630 will cover the physics, chemistry, and biology of freshwater lakes. Emphasis on: morphometry; light and temperature; water chemistry in relation to nutrients; physiological requirements; composition and interaction of algal and invertebrate populations; eutrophication; pollution; environmental change.

### **Educational objectives:**

- Learn the basic terminology used by limnologists and other aquatic scientists
- Learn and integrate multidisciplinary concepts to understand how aquatic systems function.
- Develop an understanding of how living organisms survive and interact in aquatic environments.
- Learn to identify common aquatic organisms, particularly algae, zooplankton, and macroinvertebrates.
- Learn how to collect, analyze, interpret, and report limnological data. This includes learning to critically read, with an understanding of salient points, original research articles relating to freshwater ecology.
- Become exposed to communication of science using examples from freshwater biology.

### **Lecture Topics**

- Origin of lakes
- Physical limnology
  - Lake morphometry and zones
  - Light in lakes
  - Heat in lakes
  - Water movement
- Chemical limnology
  - Oxygen
  - Salinity
  - Carbon
  - Nitrogen
  - Phosphorus
  - Sulfur and silica
- Biological limnology
  - Phytoplankton and primary production
  - Plants and macrophytes
  - Zooplankton
  - Benthos
  - Fish and trophic interactions

- Integrative limnology and applications
  - Paleolimnology
  - Acidification
  - Lake Remediation
  - Contaminants
  - Invasive species
  - Climate change
  - Multiple stressors

### Evaluation

- |                           |     |
|---------------------------|-----|
| • Midterm I*              | 10% |
| • Midterm II              | 15% |
| • Online quizzes (5 x 1%) | 5%  |
| ○ Participation in class  | 5%  |
| • Assignments (5% each)   | 15% |
| ○ Literature critique I*  |     |
| ○ Citizen science program |     |
| ○ Literature critique II  |     |
| • Labs                    | 30% |
| ○ Reports*                |     |
| ○ Bell ringer exam        |     |
| • Final exam (cumulative) | 20% |

*\*Marks for this assessment will be returned before the last day to drop courses without academic prejudice. (Total assessment before drop date: 23% (10% + 5% + 8%))*

### Labs

The class will be split into two lab sections with each lab section occurring every other week.

- Lab 1: Lake models (stratification)\* (8%)
- Lab 2: Field sampling (in 3 hr slot, likely at campus pond, alternatively, could be a Saturday ~5 hr commitment to go somewhere nicer)
- Lab 3: Microscopy and biological limnology
- Lab 4: Paleolimnology\* (12%)
- Lab 5: Microcosms
- Lab 6: Bell ringer exam (10%)

*\*These labs have lab report write ups due at the start of the next lab*

### Textbook

Limnology, 3<sup>rd</sup> Edition: Lake and River Ecosystems. Robert Wetzel. Academic Press, Elsevier.  
This text has an eBook option.

A number of scientific journal articles relevant to the material presented in the course will be posted on the course Brightspace webpage in PDF format. These papers will also be available through Memorial's library system.

## Modifications to Course for Remote Learning due to Covid-19

Each lecture topic will each be delivered in one to two 10-15 minute long videos.

The midterm and final exam will be take home (i.e. open book), with ~4 different versions of the midterm and final exam distributed to the class. A greater mark emphasis will be allotted to assignments with one additional assignment incorporated into the course. The bell ringer component of the lab mark is removed and instead students will have to complete a taxonomical assignment on an assigned freshwater species.

Remote evaluation:

- |                                     |     |
|-------------------------------------|-----|
| • Take home Midterm*                | 10% |
| • Online quizzes (5 x 2%)           | 10% |
| • Assignments (7.5% each)           | 30% |
| ○ Literature critique I*            |     |
| ○ Citizen science program           |     |
| ○ Literature critique II            |     |
| ○ Presentation                      |     |
| • Labs* (5 x 6% each)               | 30% |
| ○ Lake stratification <sup>+</sup>  |     |
| ○ Water quality <sup>+</sup>        |     |
| ○ Biological limnology              |     |
| ○ Algal blooms <sup>+</sup>         |     |
| ○ Paleolimnology <sup>+</sup>       |     |
| ○ Microcosms <sup>+</sup>           |     |
| ○ Lab reports                       |     |
| • Take-home Final exam (cumulative) | 20% |

*\*Marks for this assessment will be returned before the last day to drop courses without academic prejudice. (Total assessment before drop date: 23.5% (10% + 7.5% + 6%))*

Labs will be demonstrated by the instructor and teaching assistants over video. The data from these demonstrations will be shared with the class to analyse and interpret. Unfortunately, with remote learning the hands-on field experience for lake sampling will not be possible. Nor will microscopy laboratories. We will explore filming microscope specimens and compile microscope videos available online of live plankton.

### Instructor

Kathryn E. Hargan, Ph.D.

Assistant Professor, Department of Biology

Email: [khargan@mun.ca](mailto:khargan@mun.ca)

## Computer Science – Proposed Changes to Graduate Program

At the Departmental Meeting of April 29, 2020 and through electronic voting thereafter, the CS Department passed a number of motions that change several regulations of our graduate programs and are now being put forward for institutional approval.

The summary of the proposed changes to our graduate program regulations is here, and details follow below:

- 1) Increasing the number of required courses for PhD students
- 2) Adding Comp 690A/B as strongly recommended for PhD students
- 3) Adding Comp 690A/B as a requirement for Thesis-based Master's students (effective Fall 2021)
- 4) Rename CS work term MSc route
- 5) Limit external CS courses to those that are relevant to Computer Science for work term route

The CS Department is also planning modifications to the PhD Comprehensive Exam, to include submission of a written Thesis Proposal as a component of the Comprehensive Exam. However the PhD Comprehensive Exam shall continue to be administered in accordance with the General Regulations of the School of Graduate Studies, Section 4.8.2. of the University Calendar, and requires no Calendar change at this time.

### 1) Increasing the number of required courses for PhD students

To support breadth in the preparation of Ph.D. students, the CS department passed the motion that **Ph.D. students are required to take four courses**, instead of the previous three (which currently are only required to be any three courses at the graduate level), and that three of these courses are in Computer Science, whereas the fourth should be in a related area, as per item 6 below.

Proposed calendar change for PhD students, Article 36.7.1., item #2:

<https://www.mun.ca/regoff/calendar/sectionNo=GRAD-0362>

2. Each student for the Ph.D. shall complete a program of graduate courses prescribed by the supervisory committee. ~~The normal minimum will be 9 credit hours.~~

The program of each student must consist of a minimum of 12 credit hours in graduate courses which will include 9 credit hours from Computer Science, and the other 3 credits will be one of:

- A course in Computer Science, or a related area, as established in the list of graduate electives.
- A course related to the student's area of research.

The supervisory committee may add more courses to the student's program of studies, if it deems this appropriate.



## **2) Adding Comp 690A/B as strongly recommended for PhD students**

Comp 690A/B (Research Methods in Computer Science) is a course intended to provide the foundations of how to plan a research program in CS.

For a detailed description of the courses, please refer to:

<http://www.cs.mun.ca/~harold/Courses/Old/CS690A.F17/index.html>

<http://www.cs.mun.ca/~harold/Courses/Old/CS690B.W18/index.html>

Proposed calendar change for PhD students, Article 36.7.1., item #2:

<https://www.mun.ca/regoff/calendar/sectionNo=GRAD-0362>

2. Each student for the Ph.D. shall complete a program of graduate courses prescribed by the supervisory committee. The program of each student must consist of a minimum of 12 credit hours in graduate courses which will include 9 credit hours from Computer Science, and the other 3 credits will be one of:

- A course in Computer Science, or a related area, as established in the list of graduate electives.
- A course related to the student's area of research.

[In addition to the 12 credits mentioned above, a student is strongly recommended to take Comp 690A/B, if the student has not previously taken this course \(or an equivalent\).](#)

The supervisory committee may add more courses to the student's program of studies, if it deems this appropriate.

## **3) Adding Comp 690A/B as a requirement for Thesis-based Master's students (effective Fall 2021)**

Proposed Calendar Change under article 27.10 (Computer Science Masters'):

<https://www.mun.ca/regoff/calendar/sectionNo=GRAD-0263>

### 27.10.2 Programs

#### 27.10.2.1 Option 1 - Thesis Route

1. Students are required to complete a minimum of 15 credit hours in graduate program courses, 9 of which must be in Computer Science (excluding COMP 601W and COMP 6999). [Within this credit requirement, a student must take Comp 690A/B.](#)

## **4) Rename CS Work Term route**

Modify language in the calendar to reduce the existing ambiguity and confusion between the existing route and a purely course-based route with no work term (to be proposed in the future), and be able to offer three possible routes for our Master's: thesis, work term and, eventually, course-based:

Proposed Calendar Change:

27.10.2.2 Option 2 - ~~Course/Project Route with~~ Work Term [Route](#)

Students are required to complete a minimum of 24 credit hours in graduate program courses, of which at least 18 credit hours must be in Computer Science.... (the rest of the article to remain unchanged).

### **5) Limit external CS courses to those that are relevant to Computer Science for work term route**

Formally adopt a list of courses for students who are interested in taking courses outside of Computer Science to fulfill the degree requirements in Computer Science (would require a calendar change).

(See attachment)

Proposed Calendar Changes (accumulated with previous proposals):

27.10.2.2 Option 2 - Work Term Route

1. Students are required to complete a minimum of 24 credit hours in graduate program courses, of which at least 18 credit hours must be in Computer Science, [whereas the remaining 6 should be related to computer science, and included in the list of elective courses maintained by the Graduate Studies Committee, or previously approved by the Graduate Studies Committee, or its Chair.](#)