

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

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, December 4, 2019 at 1 p.m. in C-2045.

AGENDA

- 1. Regrets
- 2. Adoption of the Minutes of November 20, 2019
- 3. Business Arising from the Minutes
- 4. Correspondence
- 5. Reports of Standing Committees:
 - A. Undergraduate Studies Committee:
 - **a.** Department of Computer Science, special topics course COMP 4820, Modern Cybersecurity & Applied Cyber Defence, approved by the committee and presented for information only. (Paper 5.A.a, pages 7-20)
 - **b.** Department of Biochemistry, calendar proposal for new course BIOC 4231, Molecular Biology of the Bacterial-Human Interface (Paper 5.A.b, pages 21-36)
 - c. Department of Biology
 - i. Calendar proposal for new course, BIOL 4005, Biology of Islands (Paper 5.A.c.i, pages 37-56)
 - ii. Calendar proposal for new course, BIOL 4052, Fundamentals of Plant Pathology (Paper 5.A.c.ii, pages 57-74)
 - iii. Amend usage limitation on BIOL 1001 and 1002 (Paper 5.A.c.iii, pages 75-93)
 - iv. Amend course description BIOL 4620 (Paper 5.A.c.iv, pages 94-110)
 - d. Department of Chemistry
 - i. Amend program requirements for General and Honours in Computational Chemistry (Paper 5.A.d.i, pages 111-132)
 - ii. Amend program requirements for General and Honours in Chemistry (Biological) (Paper 5.A.d.ii, pages 133-156)
 - iii. Amend program requirements for General and Honours in Chemistry (Paper 5.A.d.iii, pages 157-189)
 - e. Department of Computer Science
 - i. Amend pre-requisites to COMP 3200, 3202, 3401 and 4766 (Paper 5.A.e.i, pages 190-202)
 - ii. Amend pre-requisites to COMP 2510 (Paper 5.A.e.ii, pages 203-213)
 - iii. Amend pre-requisites to COMP 3100 (Paper 5.A.e.iii, pages 214-224)
 - iv. Amend pre-requisites to COMP 4750 (Paper 5.A.e.iv, pages 225-235)
 - v. Amend co-requisite to COMP 2006, 2007 and 2008 (Paper 5.A.e.v, pages 236-247)
 - vi. Amend course title to COMP 3200 (Paper 5.A.e.vi, pages 248-258)
 - vii. Amend program requirements to Applied Mathematics and Computer Science Joint Major (Paper 5.A.e.vii, pages 259-269)

- viii. Amend program requirements to Computer Science and Geography Joint Honours, Computer Science and Physics Joint Honours (B.Sc. Only), Computer Science and Pure Mathematics Joint Honours, and Computer Science and Statistics Joint Honours (Paper 5.A.e.viii, pages 270-284)
- ix. Amend program requirements to Co-operative Internship in Computer Science (CICS) (Paper 5.A.e.ix, pages 285-296)
- x. Amend admission program requirements to Admission to Major Programs (Paper 5.A.e.x, pages 297-308)
- xi. Calendar proposal for new course, COMP 3602, Introduction to the Theory of Computation (Paper 5.A.e.xi, pages 309-317)
- xii. Calendar proposal for new course, COMP 3600, Algorithm Design and Analysis (Paper 5.A.e.xii, pages 318-326)
- xiii. Delete COMP 3719, 4740, 4756, 4762 and amend pre-requisites to COMP 4711, 4712, 4741 4742, 4743 and 4750 (Paper 5.A.e.xiii, pages 327-337)
- **f.** Department of Mathematics and Statistics, amend laboratory hours to STAT 1510 (Paper 5.A.f, pages 338-348)
- g. Department of Ocean Sciences
 - i. Amend course descriptions to OCSC 1000, 4000, 4100 and 4122 (Paper 5.A.g.i, pages 349-367)
 - ii. Amend program requirements to Minor in Sustainable Aquaculture and Fisheries Ecology, Major in Ocean Sciences, Ocean Sciences (Environmental Systems) and Honours in Ocean Sciences (Paper 5.A.g.ii, pages 368-381)
- h. Department of Psychology
 - i. Amend program requirements for Major in Psychology (Paper 5.A.h.i, pages 382-390)
 - ii. Amend program requirements for Honours in Behavioural Neuroscience (B.Sc. Only) (Paper 5.A.h.ii, pages 391-402)
 - iii. Amend program requirements for Honours in Psychology (Paper 5.A.h.iii, pages 403-413)
 - iv. Calendar proposal for new course, PSYC 2740, Domestic Animal Behaviour (Paper 5.A.h.iv, pages 414-424)
 - V. Calendar proposal for new courses, PSYC 2505, Planning for a Successful Career in Psychology I; PSYC 3505, Planning for a Successful Career in Psychology II; PSYC 4505, Planning for a Successful Career in Psychology III (Paper 5.A.h.v, pages 425-440)

B. Graduate Studies Committee:

- **a.** Department of Mathematics and Statistics, proposal for new program Master of Data Science (MDSc), special fee proposal pending. (Paper 5.B.a., pages 441-481)
- C. Library Committee
- 6. Reports of Delegates from Other Councils
- 7. Report of the Dean
- 8. Question Period
- 9. Adjournment

Mark Abrahams, Ph.D. Dean of Science



Faculty of Science

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FACULTY OF SCIENCE FACULTY COUNCIL OF SCIENCE MINUTES OF MEETING OF NOVEMBER 20, 2019

A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, November 20, 2019, at 1:00 p.m. in room C-2045.

FSC 2708 Present

Biochemistry M. Berry, R. Bertolo, J. Brunton

Biology S. Dufour

Chemistry E. Merschrod

Computer Science S. Bungay

Earth Sciences G. Dunning, P. Morrill, G. Layne

Mathematics & Statistics I. Booth, D. Dyer, S. Mantyka, JC Loredo-Osti

Ocean Sciences G. Fletcher

Physics & Physical Oceanography M. Evstigneev, M. Morrow

Psychology K. Fowler, D. Hallett, C. Thorpe, D. Wilson

Dean of Science Office M. Abrahams, K. Foss, T. Fridgen, G. Jackson, L. Zedel

Geography E. Edinger

Registrar's Office

T. Edmunds

Marine Institute

S. Caines

Staff

C. Deacon, C. Hyde, A. Langille, T. Stuckless

Graduate Students

A. Alfosool, K. Hall

FSC 2712 Regrets

E. Alcock, R. Haynes, K. Poduska, S. Sullivan

FSC 2713 Adoption of Minutes

Moved: Minutes of the October 16, 2019, meeting be adopted (Loredo-Osti /Berry). One Abstention. Carried.

Correction to October 16, 2019, Minutes: FSC 2705 Question Period:

Dr. Abrahams is chairing the Post-Secondary Education Review Submission from the St. John's academic campus. This submission will provide information to the Post-Secondary Education Review Committee on the work – teaching, research, and service to the province – currently undertaken at the university.

FSC 2714 Business Arising:

The Integrated Planning Committee (IPC) is concluding the budget consultation sessions today with the last meeting occurring at Suncor Energy Hall from 3:00pm-4:30pm. The sessions include a presentation from the Provost and then a feedback session.

FSC 2715 Correspondence: None

FSC 2716 Reports of Standing Committees:

A. Undergraduate Studies Committee:

Presented by Travis Fridgen, Associate Dean (Administration and Undergraduate)

a. Moved: Department of Earth Sciences, calendar changes amending/deleting courses (Fridgen/Dunning). **Carried.**

b. Department of Biochemistry, special topics course BIOC 4242, Field Studies in Nutrition and Food, approved by the committee and presented to faculty council for information only.

B. Graduate Studies Committee:

Presented by Graham Layne, Chair, Graduate Studies Committee

- **a.** Moved: Department of Computer Science, addition of range of special topics course numbers. (Layne/Bungay). Carried
- b. i. Moved: Department of Psychology, proposed calendar change to increase statistics training for MSc and PhD students. (Layne/Fowler). Carried. The Dean questioned whether additional resource requirements would be needed with the addition of the required courses for the graduate programs. The head of the Department of Psychology, Dr. Ken Fowler, confirmed that additional resources were not required.

ii. Moved: Department of Psychology, proposed calendar changes to alter the voting members of the PhD comprehensive examination in Experimental Psychology. (Layne/Fowler). **Three abstentions. Carried.**

c. Department of Mathematics and Statistics, special topics course, MATH 6346, Pursuit-Evasion Problems, approved by the committee and presented to faculty council for information only.

C. Nominating Committee: None

D. Library Committee: None

FSC 2717 Report of the Dean

Presented by Mark Abrahams, Dean

- 1. Gina Jackson and I submitted and presented the Faculty of Science's Budget and Academic Staffing Plan during the consultation day on October 30. All deans were required to provide feedback on each academic unit's presentation. I don't have a timeline for when we will learn of the results of this process.
- 2. I wanted to thank all who participated in this year's research week. I noted that Dr. Bose has posted his thanks to Newsline and invited participants to complete an online feedback survey.
- 3. I thank all of you who submitted your annual activity reviews. I believe that I have now responded to all who have submitted their review, but if I haven't please let me know.
- 4. I am midway through meeting with departments. I thank those with whom I have met so far and look forward to meeting the remaining departments.
- 5. I have received a request from the Provost's office for names of Academic Staff Members who would be prepared to sit on the Tuition Refund Appeals Committee. Please let us know if you are interested in serving on this committee

6. As some of you might be aware, there was an attempt to use my name via email to solicit assistance. This of course was a scam with the intention of getting you to give money in the form of gift certificates or bitcoins. If you receive such requests, please advise IT security.

FSC 2718 Question Period

FSC 2719 Adjournment

The meeting adjourned at 1:27 p.m.



Office of the Registrar

St. John's, NL Canada A1C 5S7 Tel: 709 864 8260 Fax: 709 864 2337 www.mun.ca

November 25, 2019

TO: All Members of Faculty Council, Faculty of Science

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

SUBJECT: Proposals for Calendar Changes

At meetings held on November 15 and November 19, 2019, the Faculty of Science Committee on Undergraduate Studies agreed that the following items should be forwarded to Faculty Council for approval:

- 1. <u>Department of Biochemistry New Course Biochemistry 4231 Molecular Biology of the</u> <u>Bacterial-Human Interface</u>
- 2. Department of Biology Calendar Changes
 - a. New Course Biology 4005 Biology of Islands
 - b. New Course Biology 4052 Fundamentals of Plant Pathology
 - c. Amend usage limitation on Biology 1001 and 1002
 - d. Amend course description Biology 4620
- 3. Department of Chemistry Calendar Changes
 - a. Amend program requirements for General and Honours in Computational Chemistry
 - b. Amend program requirements for General and Honours in Chemistry (Biological)
 - c. Amend program requirements for General and Honours in Chemistry
- 4. Department of Computer Science Calendar Changes
 - a. Amend pre-requisites to Computer Science 3200, 3202, 3401 and 4766
 - b. Amend pre-requisites to Computer Science 2510
 - c. Amend pre-requisites to Computer Science 3100
 - d. Amend pre-requisites to Computer Science 4750
 - e. Amend co-requisite to Computer Science 2006, 2007 and 2008
 - f. Amend course title to Computer Science 3200
 - g. Amend program requirements to Applied Mathematics and Computer Science Joint Major
 - h. Amend program requirements to Computer Science and Geography Joint Honours, Computer Science and Physics Joint Honours (B.Sc. Only), Computer Science and Pure Mathematics Joint Honours, and Computer Science and Statistics Joint Honours
 - i. Amend program requirements to Co-operative Internship in Computer Science (CICS)

- j. Amend admission program requirements to Admission to Major Programs
- k. New Course Computer Science 3602 Introduction to the Theory of Computation
- I. New Course Computer Science 3600 Algorithm Design and Analysis
- m. Delete Computer Science 3719, 4740, 4756, 4762 and amend pre-requisites to Computer Science 4711, 4712, 4741, 4742, 4743, 4750.3
- 5. Department of Mathematics and Statistics Amend laboratory hours to Statistics 1510
- 6. Department of Ocean Sciences Calendar Changes
 - a. Amend course descriptions to Ocean Sciences 1000, 4000, 4100 and 4122
 - b. Amend program requirements to Minor in Sustainable Aquaculture and Fisheries Ecology, Major in Ocean Sciences, Ocean Sciences (Environmental Systems) and Honours in Ocean Sciences
- 7. Department of Psychology Calendar Changes
 - a. Amend program requirements for Major in Psychology
 - b. Amend program requirements for Honours in Behavioural Neuroscience (B.Sc. Only)
 - c. Amend program requirements for Honours in Psychology
 - d. New Course Psychology 2740 Domestic Animal Behaviour
 - e. New Courses Psychology 2505 Planning for a Successful Career in Psychology I, 3505 Planning for a Successful Career in Psychology II, 4505 Planning for a Successful Career in Psychology III

At a meeting held on November 15, 2019 the Faculty of Science Committee on Undergraduate Studies approved a proposal for a Special Topics Course from the Department of Computer Science, and agreed that the following item should be forwarded to Faculty Council for information:

- 8. Department of Computer Science Calendar Changes
 - a. New special topics course: Computer Science 4820 Modern Cybersecurity & Applied Cyber Defence

Tracey Edmundo

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:

- \boxtimes 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

Computer Science CS4820 Modern Cybersecurity & Applied Cyber Defence

ABBREVIATED COURSE TITLE

Modern Cybersecurity

RATIONALE

We are proposing to add a special topics course in cyber security. Cybersecurity is a hot topic across all industries, protecting data and systems from security threats is more important than ever. Students express interest in a cybersecurity course on a regular basis. Currently there is almost no cybersecurity content in the existing Computer Science courses. Offering this course will help to keep the Computer Science program current.

CALENDAR CHANGES

Since this is a special topics course there will be no calendar entry.

CALENDAR ENTRY AFTER CHANGES

Since this is a special topics course there will be no calendar entry.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received	
Academic Advising Centre		
Humanities and Social Sciences		
Business Administration		
Education		
Engineering and Applied Science	No impact on Engineering programs	
Grenfell Campus (Arts & Social Sciences)		
Grenfell Campus (Science and the Environment)		
Grenfell Campus (Fine Arts)	No feedback at this time	
Human Kinetics and Recreation	No concerns	
Library	No impact on Library resources	
Marine Institute	Supports the proposal	
Medicine	Supports the change	
Music		
Nursing		
Pharmacy	No concerns	
Social Work	No suggestions	
Science		
Biochemistry		
Biology		
Chemistry	No concerns	
Office of the Dean	Noted textbook was missing from the	
	change document, had question re:	
	whether this was a special topics course	
	or regular course offering. Textbook is	
	now part of the change document.	
Earth Sciences		
Geography		
Mathematics and Statistics	No comment	
Ocean Sciences		
Physics and Physical Oceanography		

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>> SENT: October 18, 2019 10:30 AM TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle <<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>; <u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse <<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>>

SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and 4766

* Changa nna naguicit

* Change pre-requisites for COMP 2510: Programming in C/C++

* Adding pre-requisite to COMP 3100: Web Programming

* Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

* Change COMP 2006, 2007 and 2008 to be co-requisites

* Rename COMP 3200: Algorithmic Techniques for Smart Systems

* Remove a required course in Applied Math - Computer Science joint major

* Change a required course for Computer Science joint honours programs

* Change a required course for Co-operative Internship in Computer Science program

* Change Computer Science major admission requirements to be less restrictive

* Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

* Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence)

Please send your comments on these proposals to <u>cs-ugradadv@mun.ca</u>.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>>
To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca>

Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

- -

Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

----- Original Message -----Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Hyde, Cathy
Sent: Friday, November 8, 2019 4:48 PM
To: 'Math Consult' <mathconsult@mun.ca>
Subject: RE: FW: Proposed Calendar changes from Computer Science

Hi Tara,

Here are responses to your comments below:

7. The UG committee discussed this and thought that 35 required courses in the joint program might be too many, let's have further discussion for future consideration.

10. We've updated the wording to: "Six credit hours in other courses."

Let me know your thoughts.

Thanks,

Cathy Hyde, MSc | Manager of Academic Programs, MSc Department of Computer Science Memorial University of Newfoundland Tel: (709) 864-3059

From: Math Consult <<u>mathconsult@mun.ca</u>>
Sent: Monday, October 21, 2019 3:38 PM
To: <u>cs-ugradadv@mun.ca</u>
Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and 4766

Sent comments in a separate email.

- Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

Remove a required course in Applied Math - Computer Science joint 7. major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

Change a required course for Co-operative Internship in Computer 9. Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence) No comment.

Tara Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

----- Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <cs-ugradadv@mun.ca>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

- -

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering: ----- Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <bruce.guinton@mun.ca>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

- - -

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

LIBRARY REPORT

Subject: FW: FW: Proposed Calendar changes from Computer Science
Date: 2019-11-05 19:13
From: "Ambi, Alison" <<u>aambi@mun.ca</u>>
To: "<u>cs-ugradadv@mun.ca</u>" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

Dr. Byrne is not able to speak authoritatively to the potential resource needs for the proposed cybersecurity course. It does however appear that the library's current holdings should be adequate to support the course. MUN Libraries provides current access to approximately 50% of the top cybersecurity journals as identified in Scopus. While this percentage is fairly low, it will hopefully provide enough materials, in combination with the ACM Digital Library, IEEE Xplore and the library's strong book collections which include a front-list Springer ebooks package in computer science.

I would encourage whoever teaches the course to get in touch with the library if they identify specific additional needs. We will do our best, within budget limitations, to accommodate their requests.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

RESOURCE IMPLICATIONS

Introduction of this course will require a per course instructor.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Objectives of the Course

This course is a discovery of today's cyber threats and practical cyber defence in a digitalwarfare world. Modern cyber attacks are designed by skilled, financially motivated and supported adversaries who target and hold business networks for ransom, and destroy physical assets in critical industrial control systems that support our modern way of life. Students will explore information & cybersecurity threats, vulnerabilities, incident response and tactical defence strategies at an intermediate level. Real world attack and defence scenarios from the industry are explored with a focus on tactical threat hunting for defence against advanced persistent threats.

Representative Workload

Assignments (25%) Labs (10%) Project

Hardcopy report (15%)
 Presentation (10%)
 Midterm test (15%)
 Final examination (25%)

Text Book

Hacker Techniques, Tools, and Incident Handling 3rd edition by Sean-Philip Oriyano, Michael G. Solomon

Representative Course Outline

- Introduction and history (3 hours)
- Cybersecurity controls and the human element (3 hours)
- Network and endpoint security (3 hours)
- Cyber attacks and hacking techniques (3 hours)
- Malware analysis methodologies (3 hours)
- Threat intelligence (3 hours)
- Digital forensics, the kill chain and defense in action (3 hours)
- Cybersecurity teams and active defence (3 hours)
- Case studies (6 hours)

Prerequisites will be COMP 2001, COMP 2004, COMP 2006, and 3 credit hours in Computer Science courses at the 3000 level or above

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:

- X New course(s): Biochemistry 4231 Molecular Biology of the Bacterial-Human Interface
- \Box Amended or deleted course(s):
- \Box 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

BIOCHEMISTRY 4231 Molecular Biology of the Bacterial-Human Interface

ABBREVIATED COURSE TITLE

Mol Biol Bacteria and Humans

RATIONALE

The department of biochemistry has identified "Molecular Biochemistry of Health and Disease" as one of its primary research foci. The proposed course will educate undergraduates in one aspect of this focus area – namely the molecular biology of some of the bacteria that inhabit or invade human bodies, how these bacteria get established, and the biochemical mechanisms by which some bacterial pathogens can damage the host.

The course should be of interest to both Biochemistry and Biochemistry (Nutrition) students especially those who plan careers in biomedical health professions. While the emphasis of the proposed course is on bacteria, it will interface and integrate with other courses offered by the department that deal with human metabolism, gene expression, and biochemical nutrition.

The course was first offered as a Special Topics course in 2018-19 and will be offered a second time in 2019-20. This proposal is intended to regularize the course among the department's offerings.

CALENDAR CHANGES

4231 Molecular Biology of the Bacterial-Human Interface will explore the molecular biology of the bacteria that inhabit or invade human bodies, how these bacteria get established in humans, the biochemical mechanisms by which some bacterial pathogens can damage the host, and the contest for essential nutrients (e.g. iron) between bacteria and host.

PR: BIOC 3107 or 3207, or permission of the course instructor

CALENDAR ENTRY AFTER CHANGES

4231 Molecular Biology of the Bacterial-Human Interface will explore the molecular biology of the bacteria that inhabit or invade human bodies, how these bacteria get established in humans, the biochemical mechanisms by which some bacterial pathogens can damage the host, and the contest for essential nutrients (e.g. iron) between bacteria and host.

PR: BIOC 3107 or 3207, or permission of the course instructor

SECONDARY CALENDAR CHANGES

11.1.2.1 Major in Biochemistry

- 1. Required courses to complete the major:
 - d. At least 9 credit hours in courses from Biochemistry 4002, 4101, 4103, 4104, 4105, 4200, 4201, 4230, 4231, 4232-4239.

11.1.2.2 Honours Degree in Biochemistry

1. Required courses:

d. Nine credit hours in courses from Biochemistry 4002, 4101, 4103, 4104, 4105, 4200, 4201, 4230, 4231<u>, 4232</u>-4239.

11.1.2.4 Major in Nutrition

Required courses:

 d. Six credit hours in courses from
 Biochemistry 3052, 3108, 3207, 3402, 3600, 3907, 4002, 4105, 4200, 4230, <u>4231</u>, 4240, 4241-4249, Biology 3050.

11.1.2.5 Honours Degree in Nutrition

- 1. Required courses:
 - d. Nine additional credit hours chosen from
 Biochemistry 3052, 3108, 3402, 3600, 3907, 4002, 4105, 4200, 4201, 4230, <u>4231</u>, 4240, 4241-4249, Biology 3050.

10.2.3 Biochemistry and Cell Biology Joint Honours

The following courses are required:

 An additional 9 credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4 211, 4230, 4231, 4232-4239;

10.2.4 Biochemistry and Chemistry Joint Honours

The following courses are required:

 9 credit hours chosen from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4 211, 4230, 4231, 4232-4239;

10.2.5 Biochemistry and Physics Joint Honours

The following courses are required:

 An additional 9 credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4 211, 4230, 4231, 4232-4249;

10.2.6 Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours

 9 credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4 211, 4230, 4231, 4232-4239;

10.2.7 Biochemistry (Nutrition) and Psychology (Behavioural Neuroscience) Joint Honours

The following courses (or equivalent) are required:

3. Biochemistry 2200 (or 2100), 2201, 2600, 2901, 3203, 3206, 3906, Medicine 310A/B, 4300, 4301, 4502, one course chosen from: Biochemistry 3052, 3108, 3402, 3600, 4002, 4105, 4200, 4230, <u>4231</u>, 4240, 4241-4249, Biology 3050.

12.1 Biochemistry

42314232-4239 Special Topics in Biochemistry will be given for senior undergraduates, and will cover a range of topics in specialized fields in Biochemistry. They may be taught by visiting specialists when available.

PR: to be determined at the time of offering

SECONDARY CALENDAR CHANGES (Clean version)

11.1.2.1 Major in Biochemistry

Entry to the Nutrition majors program is based on academic standing.

- 2. Required courses to complete the major:
 - d. At least 9 credit hours in courses from Biochemistry 4002, 4101, 4103, 4104, 4105, 4200, 4201, 4230, 4231, 4232-4239.

11.1.2.2 Honours Degree in Biochemistry

2. Required courses:

d. Nine credit hours in courses from

Biochemistry 4002, 4101, 4103, 4104, 4105, 4200, 4201, 4230, 4231, 4232-4239.

11.1.2.4 Major in Nutrition

1. Required courses:

d. Six credit hours in courses from Biochemistry 3052, 3108, 3207, 3402, 3600, 3907, 4002, 4105, 4200, 4230, 4231, 4240, 4241-4249, Biology 3050.

11.1.2.5 Honours Degree in Nutrition

2. Required courses:

d. Nine additional credit hours chosen from Biochemistry 3052, 3108, 3402, 3600, 3907, 4002, 4105, 4200, 4201, 4230, 4231, 4240, 4241-4249, Biology 3050.

10.2.3 Biochemistry and Cell Biology Joint Honours

The following courses are required:

 An additional 9 credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4211, 4230, 4231, 4232-4239;

10.2.4 Biochemistry and Chemistry Joint Honours

The following courses are required:

 9 credit hours chosen from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4211, 4230, 4231, 4232-4239;

10.2.5 Biochemistry and Physics Joint Honours

The following courses are required:

 An additional 9 credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4211, 4230, 4231, 4232-4249;

10.2.6 Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours

 9 credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4 211, 4230, 4231, 4232-4239;

10.2.7 Biochemistry (Nutrition) and Psychology (Behavioural Neuroscience) Joint Honours

The following courses (or equivalent) are required:

3. Biochemistry 2200 (or 2100), 2201, 2600, 2901, 3203, 3206, 3906, Medicine 310A/B, 4300, 4301, 4502, one course chosen from: Biochemistry 3052, 3108, 3402, 3600, 4002, 4105, 4200, 4230, 4231, 4240, 4241-4249, Biology 3050.

12.1 Biochemistry

4232-4239 Special Topics in Biochemistry will be given for senior undergraduates, and will cover a range of topics in specialized fields in Biochemistry. They may be taught by visiting specialists when available.

PR: to be determined at the time of offering

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Academic Unit	Response received?
Chemistry	No
Computer Science	No
Math and Stats	No
Ocean Sciences	No
Psychology	No
Biology	Yes
Physics	No
Computer Science	No
Humanities and Social Sci	No
Geography	No
Human Kinetics and Rec	Yes
Pharmacy	Yes
Nursing	No
Arts and Soc Sci (Grenfell)	No
Marine Intitute	Yes
Medicine	No
Engineering	Yes
Education	No

LIBRARY REPORT

A library report is appended.

RESOURCE IMPLICATIONS

There are no resource implications with regularizing this course.



Collection Development Division Queen Elizabeth II Library

7 November 2019

То:	Janet Brunton, Department of Biochemistry
From:	Erin Alcock, Science Research Liaison Librarian
Subject:	New Course Proposal: BIOC 4231 Molecular Biology of the Bacterial- Human Interface

I have reviewed the proposal to regularize BIOC 4231 – Molecular Biology of the Bacterial-Human Interface and I have determined that the Memorial University Library system has more than sufficient holdings to support the objectives of this course.

Table One indicates modest monograph holdings based upon the course outline topics, but there is no shortage of access to scholarly articles, which I understand will form the main readings for the course. Dr. Mulligan is encouraged, as always, to get in touch if any subscriptions are found lacking where course readings are concerned.

Week	Topics	Catalogue holdings	Books, articles & more search
1	Regulation of gene expression in bacterial cells	78	445,000+ results
2	Signal recognition mechanisms in bacteria	18	112,000+
3	Secretory systems in bacteria	5	33,000+
4	Adherence role of pili and flagellae in the mechanism of bacterial attachment to host human cells		150
5			
6	Regulation of Bacterial Virulence	40	89,000+
7	Bacterial exotoxins and their mechanisms of action (1)		5,000+
8	Non-ribosomal peptide synthesis		3,800+
9	Bacterial exotoxins and their mechanisms of action (2)		
10	Goodfellas: biofilms, commensal bacteria, the gut and other microbiomes	27	21,000+
11	The three Fates: persistence, replication, and escape - Long-term bacterial survival: <i>Salmonella</i> and <i>Staphylococcus</i> , and possibly <i>Helicobacter</i>	7	5,700+
12	Bacterial defence strategies	30	73,000+

Table One: Library catalogue holdings based upon course outline (as of date of memo)

Suzanne Dufour <sdufour@mun.ca>

Thu 10/31, 10:32 AM BiocDHundergrad; jodyb@mun.ca Reply all

Bioc 4231 Consultation ... 830 KB

Download

Good morning,

The Biology Undergraduate Studies Committee has reviewed your proposal to regularize BIOC 4231. We have no concerns with the proposal.

Best wishes,

Suzanne

----- Forwarded Message ------

Subject: FW: Consultation: Regularization of Biochemistry 4231 Molecular Biology of the Bacterial-Human Interface

Date:Fri, 11 Oct 2019 19:06:25 +0000

From:Dean of Science <a href="mailto:

Amina Ahmed Mahmood <u><aamahmood@mun.ca></u>, BiocDHundergrad <u><biocdhundergrad@mun.ca></u>, Hyde, Cathy <u><cathy@mun.ca></u>, Chemistry <u><chemconsult@mun.ca></u>, Computer Science consultation <u><compsci@mun.ca></u>, Earth Sciences <u><eascugcon@mun.ca></u>, James Munroe <u><jmunroe@mun.ca></u>, Math & To:Stats <u><mathconsult@mun.ca></u>, Ocean Sciences <u><amercier@mun.ca></u>, Goulding, Rick <u><rgoulding@mun.ca></u>, Psychology consult <u><psychdeputyhead@mun.ca></u>, Newhook, Rebecca <u><rnewhook@mun.ca></u>, Sharene Bungay <u><sharene@mun.ca></u>, Suzanne Dufour <u><sdufour@mun.ca></u>, Mackenzie, Theresa <u><tmackenz@mun.ca></u>, Associate Dean of Science (Undergraduate) <u><adsu@mun.ca></u>

Engineering Consult <engrconsult@mun.ca> Wed 10/23, 3:04 PM

Dear Dr. Brunton,

Thank you for the opportunity to comment on the Calendar change document for BIOC 4231.

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 this proposed change. 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

Davis,Erin

Fri 10/18, 3:45 PM

Bioc 4231 Consultation ... 830 KB

Download

Thank you for sending these changes for our consideration. Pharmacy has no concerns with the proposed changes. Erin

Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca

MIUG Consultations < MIUG consultations@mi.mun.ca>

Thu 10/17, 8:48 AM

Hi Janet,

Thank you for the opportunity to review and comment on the proposal for the Regularization of Biochemistry 4231 Molecular Biology of the Bacterial-Human Interface. This will have no impact on Marine Institute programs and we support the proposal.

Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

Rohr, Linda

Tue 10/15, 9:10 PM

Hi,

No concerns from HKR for Biochemistry 4231.

Linda

Linda E. Rohr PhD

Dean, School of Human Kinetics & Recreation Memorial University t: 709.864.8129 f: 709.864.7531 e: <u>lerohr@mun.ca</u> PE 2027

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Biochemistry 4231 - Molecular Biology of the Bacterial-Human Interface

This sample is based on the Special Topics offering in Winter 2019

Instructor:	Dr. Martin Mulligan		
Office:	SN-3022		
Phone:	864-7978		
Email:	You may use either BRIGHTSPACE (D2L) or my regular email address (<u>mulligan@mun.ca</u>) for email.		
Office Hours:	Open door policy – if I am in my office, feel free to stop by. If I cannot see you right away, we will arrange an appointment for a mutually convenient time.		
Course Prerequisite:	BIOC 3107, 3207, or permission of the instructor		
Description	Molecular Biology of the Bacterial-Human Interface will explore the molecular biology of the bacteria that inhabit or invade human bodies, how these bacteria get established, and the biochemical mechanisms by which some bacterial pathogens can damage the host.		
Objectives	 Students will acquire greater knowledge of the mechanisms by which gene expression is regulated in bacterial systems. Students will develop (further) competencies in preparing oral reports and to effectively communicate scientific findings. Students will develop (further) competencies in locating, retrieving, and evaluating scientific information, including primary literature, with regards to its adequacy, value, and logic. Students will develop (further) competencies in computer skills including: literature search strategies, use of word-processing, and presentation tools. 		
Assessment: (tentative)	Mid-Term Writing Assignment Research Article Assignment Final Exam/Essay	20% 10% 35% 35%	WARNING: Possession of electronic devices (e.g. cell phone) or unauthorized written crib notes during an exam is an academic offence and will result in a mark of zero for that exam
Class	Class will be held on TBD. Please note that online assignr adverse weather.	nent(s) may be s	set in lieu of any lectures cancelled due to

Mid-Term Exam:	Date TBD NOTE: In the event of a storm related cancellation of class on that day, the exam will be held on one of the next two class dates.
Research Article Assignment:	Each student will choose a recent research article on a topic related to the course material. The student will prepare a Powerpoint presentation based on the paper and its relevant background. Students will meet with the course instructor to deliver their Powerpoint in a question-and-answer format. Each meeting will not exceed 30 mins.
	A list of recent research papers will be posted to BRIGHTSPACE in the first two weeks of classes.
	Presentations will be scheduled at mutually agreed times during the last three weeks of the semester.
Creative Writing Assignment	Each student will write a creative dialogue on a topic related to the molecular biology of the bacterial-human interface . Further information on the topic will be provided by the instructor later in the semester. Sample dialogues will be provided to guide and/or inspire you. Due date: TBD .
Exams:	 The midterm exam will consist of short answer and/or short essay questions. A "problem" type of question might be included. The final exam will be an essay on a topic that will be announced in advance. Note: The mark you receive for any essay questions will depend on the quality of writing as well as on content. (cf. University Regulation 6.9.3.1: "Good writing is expected of students in all courses") Note: Please read the Instructions for Students Regarding the Conduct of Examinations available on
Course Text:	 The Registrar's website: https://www.mun.ca//invigilation_Procedures_May_12_2009.pdf There is no text for the course. Some background material will be drawn from: "Molecular Genetics of Bacteria, 4th Ed." A copy of the 3rd edition will be placed on reserve in the Library for consultation; in addition, the Library has access to an eBook copy of the 4th edition. "Microbiology: An Evolving Science by John W Foster, and Joan L Slonczewski (3rd or 4th Edition) WW Norton & Co Inc". A copy of will be placed on reserve in the Library for consultation. Readings from the scientific literature will be assigned for each topic. It is anticipated that these will primarily be review articles, and open access articles will be used whenever possible. The course instructor will have a copy in the event that online access fails.
Policy on Late Submission of Assignments	If an assignment is submitted late, your work will be marked subject to a 10% reduction in the value of the mark per day late.

Supplementary Exams:	No supplementary exams will be offered in Biochemistry 4231.
Policy on Missed Exams	There will be NO make-up midterm examination. If you miss the mid-term your final exam will be worth 55% of your course mark.
Some other things to keep in mind	 As a courtesy to your classmates and instructor: Please turn your cell phones to silent and resist the urge to look at messages <i>etc.</i> until after class. If you are using a laptop or tablet computer please use them for reading class notes only while the lecture is in progress. If you arrive late, please take your seat quietly. If you need to leave early or unexpectedly, please do so as quietly as possible. Lectures may not be recorded without permission of the course instructor.
Student Supports	Please see the document "A list of services for Student Success and Support" on the course BRIGHTSPACE page.
Academic Integrity	University Calendar Section 6.12 "Within the University community there is a collective responsibility to maintain a high level of scholarly integrity. A student is expected to adhere to those principles which constitute proper academic conduct. Academic misconduct cannot be condoned or even appear to be condoned. A student has the responsibility to know which actions, as described under Academic Offences, could be construed as dishonest or improper. A student is reminded that for further guidance on proper scholarly behaviour the student should seek advice from the student's instructors and faculty advisors."

SAMPLE TOPIC OUTLINE

The following is a sample of the topics that might be covered during the course. The exact list of topics will be fine-tuned based on the Winter 2020 Special Topics offering, and the order of topics may change.

WEEK 1	Regulation of gene expression in bacterial cells Review of transcription and translation; RNA polymerase and sigma factors; positive and negative mechanisms of transcription regulation; mechanisms of regulating translation
WEEK 2	Signal recognition mechanisms in bacteria Two-component signal transduction systems – theme and variations; other pathways (STYK phosphatases, cyclic-di-GMP), quorum-sensing and signal systems (HSLs and peptides) in general
WEEK 3	Secretory systems in bacteria Protein synthesis, protein targeting in bacterial cells, the Sec pathway, classes of secretion system, type III secretion systems and injectisomes, autotransporters, type VI secretion systems, gram- positive systems

WEEK 4	Adherence role of pili and flagellae in the mechanism of bacterial attachment to host human cells
WEEK 5	Midterm Exam
WEEK 6	Regulation of Bacterial Virulence Pathogenicity islands; Regulation of the synthesis of: Cholera Toxin and other virulence determinants, Shiga toxins, and Staphylococcus toxins
WEEK 7	Bacterial exotoxins and their mechanisms of action (1) Classification of bacterial toxins; exotoxins and their targets; diptheria toxin and ADP-ribosylation
WEEK 8	Non-ribosomal peptide synthesis NRPS systems and polyketide synthases, biochemistry and molecular biology, molecules synthesized by NRPS systems: antibiotics and genotoxins
WEEK 9	Bacterial exotoxins and their mechanisms of action (2) Genotoxins (e.g. CDT and colibactin), structure and synthesis, cellular targets and modes of action
WEEK 10	Goodfellas: biofilms, commensal bacteria, the gut and other microbiomes
WEEK 11	The three Fates: persistence, replication, and escape - Long-term bacterial survival: Salmonella and Staphylococcus, and possibly Helicobacter
WEEK 12	Bacterial defence strategies Phase variation mechanisms in bacteria, e.g. <i>Bordetella pertussis, Salmonella</i>
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:

- X New course(s):
- \Box 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 4005 – Biology of Islands

REVISED COURSE NUMBER AND TITLE

NA

ABBREVIATED COURSE TITLE

Biology of Islands

RATIONALE

Island biology has wide ranging significance with applications to basic theoretical science, as well as economic and management considerations. This content covered in this course is especially relevant for students of Memorial who will live and work on our island. Currently, there is no other course offered at Memorial University that focuses on island 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.

4005 Biology of Islands will examine the ecology and evolution of island life forms, including processes unique to islands, the history of the biological study of islands, types of islands, major island groups, and conservation biology and management of islands, including island restoration and expected impacts of anthropogenic climate change. The island-related biology of Newfoundland will be discussed in detail. OR: 3 hours of seminar/discussion group each week. PR: Science 1807 and Science 1808; BIOL 2600 and 2900

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.

4005 Biology of Islands will examine the ecology and evolution of island life forms, including processes unique to islands, the history of the biological study of islands, types of islands, major island groups, and conservation biology and management of

islands, including island restoration and expected impacts of anthropogenic climate change. The island-related biology of Newfoundland will be discussed in detail.

OR: 3 hours of seminar/discussion group each week.

PR: Science 1807 and Science 1808; BIOL 2600 and 2900

SECONDARY CALENDAR CHANGES

None.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

Academic Unit	Response
Humanities and Social Sciences	No
Business Administration	Yes
Education	
Engineering and Applied Science	Yes
Grenfell Campus: Arts and Social Science Science and the Environment Fine Arts	No
Human Kinetics and Recreation	Yes
Marine Institute	No
Medicine	Yes
Music	No
Nursing	No
Pharmacy	Yes
Science Geography	Yes
Social Work	Yes
Library	Yes

CONSULTATIONS SOUGHT

LIBRARY REPORT

A library report is attached.

RESOURCE IMPLICATIONS

This course will be taught by a faculty member with an expertise in island biology and developed for Winter 2021 delivery. There are no resource implications.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Sample Course Outline and Method of Evaluation

Department of Biology – BIOL 4005: Biology of Islands

Lecture Topics (22 lectures)

Introduction

- Biological definitions of 'island'
- Importance of islands to studies of ecology and evolution
- Brief summary of island types
- Traditional and non-traditional forms of island
- Island colonization and conservation biology
- Newfoundland as an island

Ecology and evolution of island life forms

- Alfred Russell Wallace and Charles Darwin early work on island biology
- The theory of island biogeography species richness and representation
- Coastal versus oceanic islands general characteristics and examples
- Speciation on islands theory and patterns, inter-specific competition, adaptive radiation of
- colonists
- Island versus mainland plants, insects, reptiles and amphibians, birds, mammals ecology and evolution
- Patterns of endemism by taxonomic group and island type
- Evolution of gigantism, dwarfism, flightlessness, tameness, loss of plant defenses, loss of
- immune defenses, niche expansion and foraging behavior, and sexual selection
- Colonization of new volcanic islands
- Climate change and island ecology

Biological patterns and processes on traditional islands – land surrounded by water

• Small continents as large islands (Australia, New Guinea, New Zealand, Sri

Lanka, Madagascar)

- Remote islands: Galapagos, west Mexico, Hawaiian Islands, Easter Island
- Emerging new volcanic islands
- Coral reefs and atolls
- The Atlantic Islands
- Caribbean Islands
- Arctic islands
- Sub Antarctic islands
- Islands in fresh water (Great Lakes, Barro Colorado)
- Canadian Islands (Haida Gwaii, British Columbian coastal islands, islands in the Great Lakes, Atlantic Canadian islands – Sable, St. Paul, Prince Edward Island, Newfoundland)

Biological patterns and processes on non-traditional islands – isolated places with island characteristics

- Desert Oases and remote springs
- Remote lakes (Baikal, Lake Victoria)
- Sky islands and tepuis
- Nunataks
- Cave systems
- Deep ocean hydrothermal vents
- Remote industrial-military sites e.g., DEW line sites, offshore structures
- National parks and preserves as islands in altered landscapes
- Continents as islands and continental drift
- The earth as an island

History: biological impacts of human colonization of the world's islands

- Anthropogenic extinctions on islands Dodos, Moas, Elephant birds, marsupials, and Easter Island
- Ecological, technological and political factors affecting island colonizations by humans
- Pre-historic colonisations: Australia, Madagascar, Atlantic Islands (Cape Verde, Azores, Canary, Madeira), Caribbean Islands (Amerindians), and Pacific Islands (Polynesians).
- European colonization: Caribbean Islands (ever since Columbus), Atlantic Islands, Pacific Islands (post-Cook)
- Recent history of the Galapagos Islands
- Summary of global island status in the Anthropocene

Conservation biology of islands

- Studies and management of human modification of island ecosystems: deforestation, hunting, introduction of diseases and pathogens, and introduced flora and fauna
- Ecological disruption and re-assortment
- Impacts of anthropogenic climate change on island ecosystems
- Island restoration: Aleutians, west Mexico, sub Antarctic islands

Newfoundland – 'our' island's biology

- Geological, post-glacial and human history of Newfoundland
- Natural biodiversity and endemism
- Introduced mammals history, patterns of colonization, and ecological effects
- Insect introductions and invasions
- Plant introductions and invasions
- Influences of climate change past and present
- Conservation biology applied to Newfoundland

Laboratory (seminar) Topics

The lab section will consist of seminar presentations in which reviews of current scientific literature of island biology will be presented and discussed. The emphasis will be on recent and ground-breaking publications. Weekly quizzes on the preceding week's material will encourage participation and measure uptake of the concepts covered.

Laboratory 1

Recent theoretical and empirical advances in the field of island biogeography

Laboratory 2

Recent studies of special behavioural and anatomical trait evolution on islands

Laboratory 3

New literature on biological patterns and processes on traditional islands – land surrounded by water I

Laboratory 4

New literature on biological patterns and processes on traditional islands – land surrounded by water II

Laboratory 5

Ecological process on non-traditional islands

Laboratory 6

Recent advances in the understanding of the ecological effects of human colonization of the world's islands

Laboratory 7

Island restoration projects in Conservation Biology – rationale, methods, and evaluations of success and failure

Laboratory 8

Recent literature concerning Newfoundland island biology

Proposed Evaluation Scheme

Deliverable	Due Date	Mark Distribution
Essay Assignment 1	Week 4	15%
Essay Assignment 2	Week 8	15%
Midterm	Week 6	20%
Laboratory Quizzes	weekly	5%
Laboratory Presentation	once	15%
Final Exam	ТВА	30%

Texts

There is no assigned textbook for this course

Instructor(s)

Dr. lan Jones

From:	<u>Davis, Erin</u>
То:	Jody-Lynn Burke
Subject:	Consultation on Calendar Changes - Biology
Date:	Wednesday, October 9, 2019 8:41:23 AM
Attachments:	BIOL 1001 & 1002 Updated Description.pdf BIOL 4620 Updated Description.pdf New Course - BIOL 4005.pdf New Course - BIOL 4052.pdf
Importance:	High

Hi Jody,

Thank you for forwarding these changes for our consideration. We don't see any impact on Pharmacy and therefore have no concerns.

Erin

--Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca Hi Jody-Lynn,

Just dropping a quick line to let you know you can replace Dr. Larry Bauer's name on your distribution list with mine. I am now responsible for all academic programs in the Business faculty.

Many thanks and best regards.

Rachelle

Rachelle J. Shannahan, PhD Associate Dean, Academic Programs Faculty of Business Administration Memorial University of Newfoundland

rshannahan@mun.ca

From: Lawrence Bauer [mailto:lbauer@mun.ca]
Sent: Tuesday, October 8, 2019 4:12 PM
To: Shannahan, Rachelle <rshannahan@mun.ca>
Subject: Fwd: Consultation on Calendar Changes - Biology
Importance: High

Begin forwarded message:

From: Jody-Lynn Burke <<u>irotchford@mun.ca</u>> Subject: Consultation on Calendar Changes - Biology Date: October 8, 2019 at 2:14:55 PM NDT To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>, "Bauer, Larry" <<u>lbauer@mun.ca</u>>, "Collett, Meghan" <<u>mcollett@mun.ca</u>>, "engrconsult@mun.ca" <engrconsult@mun.ca>, "lrobinson@grenfell.mun.ca" <<u>lrobinson@grenfell.mun.ca</u>>, "<u>ssedean@grenfell.mun.ca</u>" <<u>ssedean@grenfell.mun.ca</u>>, "<u>thennessey@grenfell.mun.ca</u>" <<u>thennessey@grenfell.mun.ca></u>, "Rohr, Linda" <<u>lerohr@mun.ca</u>>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>, "deanofmedicine@med.mun.ca" <deanofmedicine@med.mun.ca>, "Sutherland, Ian D" <<u>isutherland@mun.ca</u>>, DeanNurse <<u>DeanNurse@mun.ca</u>>, "<u>pharminfo@mun.ca</u>" <<u>pharminfo@mun.ca</u>>, Dean of Science <<u>deansci@mun.ca</u>>, adeanugradswk <<u>adeanugradswk@mun.ca</u>>, Library Correspondence <<u>univlib@mun.ca</u>> Cc: Suzanne Dufour <<u>sdufour@mun.ca</u>>

Dear colleagues,

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- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.

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

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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Larry Bauer, Ph.D.

Associate Professor of Finance Faculty of Business Administration

Memorial University of Newfoundland St. John's Nfld, A1B 3X5

www: <u>http://www.business.mun.ca</u> <u>e-mail: lbauer@mun.ca</u> Tel: (709) 864-3537 Fax: (709) 864-8954

SSRN: http://ssrn.com/author=327175

From:	<u>cvardy@mun.ca</u>
To:	Jody-Lynn Burke
Cc:	Margaret.Steele@med.mun.ca
Subject:	FW: Consultation on Calendar Changes - Biology
Date:	Thursday, October 17, 2019 11:05:49 AM
Attachments:	<u>ATT00001.htm</u>
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	BIOL 4620 Updated Description.pdf
	ATT00003.htm
	New Course - BIOL 4005.pdf
	ATT00004.htm
	New Course - BIOL 4052.pdf
	ATT00005.htm

Good Day

The Faculty of Medicine supports the proposed calendar changes for Biology as per the attachments.

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

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From: Jody-Lynn Burke <jrotchford@mun.ca>

Date: October 8, 2019 at 2:14:55 PM NDT

To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>, "Bauer, Larry"

<<u>lbauer@mun.ca</u>>, "Collett, Meghan" <<u>mcollett@mun.ca</u>>, "<u>engrconsult@mun.ca</u>"

<<u>engrconsult@mun.ca</u>>, "<u>lrobinson@grenfell.mun.ca</u>" <<u>lrobinson@grenfell.mun.ca</u>>,

"ssedean@grenfell.mun.ca" <ssedean@grenfell.mun.ca>,

"thennessey@grenfell.mun.ca" <thennessey@grenfell.mun.ca>, "Rohr, Linda"

<lerohr@mun.ca>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>,

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Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer Department of Biology, Memorial University Office: (709) 864 8021 E-mail: <u>jodyb@mun.ca</u>

Hello Jody-Lynn,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW

Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

From: Jody-Lynn Burke <jrotchford@mun.ca>

Sent: October 8, 2019 2:15 PM

To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Bauer, Larry <lbauer@mun.ca>; Collett, Meghan <mcollett@mun.ca>; engrconsult@mun.ca; lrobinson@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; Rohr, Linda <lerohr@mun.ca>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D <isutherland@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>
Cc: Suzanne Dufour <sdufour@mun.ca>

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Department of Biology, Memorial University Office: (709) 864 8021 E-mail: jodyb@mun.ca



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 From:
 Catto, Norm

 To:
 Burke, Charlene; Jody-Lynn Burke

 Subject:
 RE: Consultation on Calendar Changes - Biology

 Date:
 Wednesday, October 9, 2019 7:54:30 AM

No issues from HSS. Geography may apply to cross-list "Biology of Islands" at a later time, but not immediately.

Norm Catto Head, Department of Geography Memorial University St. John's NL A1B 3X9 Canada 1-709-864-7463 Fax 1-709-864-3119

From: Burke, Charlene <charlenes@mun.ca>
Sent: Tuesday, October 8, 2019 2:53 PM
To: Catto, Norm <ncatto@mun.ca>
Subject: FW: Consultation on Calendar Changes - Biology
Importance: High

Hello Dr. Catto,

Is this something that needs to be reviewed by CPC?

Charlene

From: Jody-Lynn Burke <jrotchford@mun.ca</pre>

Sent: Tuesday, October 8, 2019 2:15 PM

To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Bauer, Larry <<u>lbauer@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; engrconsult@mun.ca; lrobinson@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; Rohr, Linda <<u>lerohr@mun.ca</u>>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D<<isutherland@mun.ca>; DeanNurse <<u>DeanNurse@mun.ca</u>>; pharminfo@mun.ca; Dean of Science<<<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence<<<u>univlib@mun.ca</u>>
Cc: Suzanne Dufour <<u>sdufour@mun.ca</u>>

Subject: Consultation on Calendar Changes - Biology Importance: High

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Department of Biology, Memorial University Office: (709) 864 8021 E-mail: <u>iodyb@mun.ca</u>



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From:	Rohr, Linda
To:	Jody-Lynn Burke
Subject:	Re: Consultation on Calendar Changes - Biology
Date:	Tuesday, October 15, 2019 9:44:17 PM

Hi,

No concerns from HKR with the proposed changes to Biology courses.

Linda

Linda E. Rohr PhD Dean, School of Human Kinetics & Recreation Memorial University t: 709.864.8129 f: 709.864.7531 e: <u>lerohr@mun.ca</u> PE 2027

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

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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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From:	Engineering Consult
To:	Jody-Lynn Burke
Cc:	Edmunds, Jayde; Peters, Dennis; Bruce Quinton
Subject:	Re: Consultation on Calendar Changes - Biology
Date:	Wednesday, October 23, 2019 3:03:10 PM
Importance:	High

Dear Ms. Burke,

Thank you for the opportunity to comment on the sets of Calendar change documents for BIOL 1001, 1002, 4005, 4052 and 4620

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 2019-10-08 14:14, Jody-Lynn Burke wrote: > Dear colleagues, > > The purpose of this email is to extend an opportunity for you to > provide feedback on the attached calendar change proposals. Please > find attached proposals relating to: > * Updated Calendar description for BIOL 1001 & 1002 > * Updated Calendar description for BIOL 4620 > * New Course - BIOL 4005 > * New Course - BIOL 4052 > > > Your feedback, at your earliest convenience, is appreciated. > > If you have any questions, please don't hesitate to contact me. >> 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 >> [1] > > > > Links:

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:

- X New course(s):
- \Box 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 4052 – Fundamentals of Plant Pathology

REVISED COURSE NUMBER AND TITLE

NA

ABBREVIATED COURSE TITLE

Fund. of Plant Pathology

RATIONALE

Plant pathology is the science that studies plant diseases, with the ultimate goal of reducing losses caused by plant diseases in order to increase quality and quantity of plant yields. The proposed course will provide students at Memorial University with a solid understanding of the basic principles of plant pathology and will prepare them for higher-level studies in this field. As plant diseases are caused by similar organisms responsible for human and animal diseases, many of the principles covered will also be applicable to those students interested in human and animal medicine.

The proposed course will be a useful elective for the various programs offered by the Department of Biology [Major in Biology, Major in Biology (Co-operative), Honours in Biology, Honours in Biology (Co-operative)]. Importantly, the proposed course will draw upon material from peer-reviewed publications in order to expose students to cutting edge research in both basic and applied plant pathology. Guest lectures from plant pathologists working in provincial and/or federal government agencies will be arranged in order to give students an idea of the different career paths in this field that are available to them. Currently, there is no other course offered at Memorial University that focuses on plant pathology.

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.

4052 Fundamentals of Plant Pathology provides an introduction to the basic concepts used in the study of plant diseases. Topics that will be covered include the different causes and types of plant diseases, the mechanisms of plant disease development, pathogen interactions with their hosts and host resistance to pathogens, plant disease epidemiology, and disease management practices. The history and social impacts of plant diseases, as well as current issues in plant health such as food security, will also be covered. OR: 3 hour seminar/discussion weekly PR: Science 1807 and Science 1808; BIOL 3050

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.

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OR: 3 hour seminar/discussion weekly PR: Science 1807 and Science 1808; BIOL 3050

SECONDARY CALENDAR CHANGES

None.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

Academic Unit	Response
Humanities and Social Sciences	No
Business Administration	Yes
Education	No
Engineering and Applied Science	Yes
Grenfell Campus: Arts and Social Science Science and the Environment Fine Arts	No
Human Kinetics and Recreation	Yes
Marine Institute	No
Medicine	Yes
Music	No
Nursing	Νο
Pharmacy	Yes
Science Geography	Yes
Social Work	Yes
Library	Yes

CONSULTATIONS SOUGHT

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 plant pathology. No additional instructional costs will be required.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Proposed Course Outline

Fundamentals of Plant Pathology will consist of 3 hours of lectures each week and a 3 hour weekly seminar/discussion session. The lectures will be based on material from two textbooks (Schumann, GL and D'Arcy, CJ. 2009. Essential Plant Pathology, 2nd edition, APS Press; Agrios, GN. 2005. Plant Pathology, 5th edition, Elsevier Academic Press) as well as from relevant peer-reviewed publications. The seminar/discussion sessions will consist of two group discussions on assigned readings from the scientific literature as well as student presentations on current research topics in basic and applied plant pathology.

Lecture Topics

- 1. Introduction to plant pathology
 - a. What is plant pathology?
 - b. History of plant diseases and their impacts on society
 - c. General terminology and definitions
- 2. Causes of plant diseases
 - a. Abiotic causes
 - b. Biotic causes
 - i. Fungi and fungal-like organisms
 - ii. Bacteria
 - iii. Nematodes
 - iv. Viruses and viroids
 - v. Parasitic flowering plants
 - c. Basic procedures in the diagnosis of plant diseases
- 3. Types of plant diseases
 - a. Rusts and smuts
 - b. Vascular diseases
 - c. Diseases of aerial plant parts
 - d. Soilborne diseases
 - e. Wood decay and post-harvest diseases
- 4. Interactions between plants and pathogens
 - a. Host range of pathogens
 - b. Development of disease in plants: the disease triangle
 - c. Stages of disease development: the disease cycle

- d. How pathogens attack plants
- e. How plants defend themselves against pathogens
- 5. Plant disease epidemiology
 - a. Elements of an epidemic
 - b. Host factors influencing the development of epidemics
 - c. Pathogen factors influencing the development of epidemics
 - d. Environmental factors influencing the development of epidemics
 - e. New tools in epidemiology
- 6. Plant disease management: principles and practices
 - a. Control methods that exclude the pathogen from the host
 - b. Control methods that eradicate or reduce pathogen inoculum
 - c. Direct protection of plant by chemicals
 - d. Direct protection of plants by biological controls

Evaluation

Midterm Exam 1†	15%
Midterm Exam 2	15%
Online Quizzes (5 x 2%)	10%
Discussions (2 x 5%)‡	10%
Presentation	10%
Final Exam (cumulative):	40%

† Marks for this assessment will be returned before the last day to drop courses without academic prejudice

‡ Marks for one discussion session will be returned before the last day to drop courses without academic prejudice

Textbook

There is no required textbook for this course. The following textbooks will be available on reserve in the library:

Plant Pathology, 5th edition (2005) by G.N. Agrios, Elsevier Academic Press, Inc.

Essential Plant Pathology, 1st edition (2006) by G.I. Schumann and C.J. D'Arcy, APS Press.

Instructor

Dawn R. D. Bignell, Ph.D Associate Professor, Department of Biology Email: dbignell@mun.ca

From:	Davis, Erin
To:	Jody-Lynn Burke
Subject:	Consultation on Calendar Changes - Biology
Date:	Wednesday, October 9, 2019 8:41:23 AM
Attachments:	BIOL 1001 & 1002 Updated Description.pdf BIOL 4620 Updated Description.pdf New Course - BIOL 4005.pdf New Course - BIOL 4052.pdf
Importance:	High

Hi Jody,

Thank you for forwarding these changes for our consideration. We don't see any impact on Pharmacy and therefore have no concerns.

Erin --

Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca Hi Jody-Lynn,

Just dropping a quick line to let you know you can replace Dr. Larry Bauer's name on your distribution list with mine. I am now responsible for all academic programs in the Business faculty.

Many thanks and best regards.

Rachelle

Rachelle J. Shannahan, PhD Associate Dean, Academic Programs Faculty of Business Administration Memorial University of Newfoundland

rshannahan@mun.ca

From: Lawrence Bauer [mailto:lbauer@mun.ca]
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Larry Bauer, Ph.D.

Associate Professor of Finance Faculty of Business Administration

Memorial University of Newfoundland St. John's Nfld, A1B 3X5

www: <u>http://www.business.mun.ca</u> <u>e-mail: lbauer@mun.ca</u> Tel: (709) 864-3537 Fax: (709) 864-8954

SSRN: http://ssrn.com/author=327175

From:	<u>cvardy@mun.ca</u>
To:	Jody-Lynn Burke
Cc:	Margaret.Steele@med.mun.ca
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Good Day

The Faculty of Medicine supports the proposed calendar changes for Biology as per the attachments.

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

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Vision: Through excellence, we will integrate education, research and social accountability to advance the health of the people and communities we serve.

Destination Excellence: Faculty of Medicine Strategic Plan 2018-2023

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"thennessey@grenfell.mun.ca" <thennessey@grenfell.mun.ca>, "Rohr, Linda"

<lerohr@mun.ca>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>,

"<u>deanofmedicine@med.mun.ca</u>" <<u>deanofmedicine@med.mun.ca</u>>, "Sutherland, Ian D"

<<u>isutherland@mun.ca</u>>, DeanNurse <<u>DeanNurse@mun.ca</u>>, "<u>pharminfo@mun.ca</u>" <<u>pharminfo@mun.ca</u>>, Dean of Science <<u>deansci@mun.ca</u>>, adeanugradswk <<u>adeanugradswk@mun.ca</u>>, Library Correspondence <<u>univlib@mun.ca</u>> **Cc:** Suzanne Dufour <<u>sdufour@mun.ca</u>>

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Heather J. Hair, PhD, RSW

Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

From: Jody-Lynn Burke <jrotchford@mun.ca>

Sent: October 8, 2019 2:15 PM

To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Bauer, Larry <lbauer@mun.ca>; Collett, Meghan <mcollett@mun.ca>; engrconsult@mun.ca; lrobinson@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; Rohr, Linda <lerohr@mun.ca>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D <isutherland@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>
Cc: Suzanne Dufour <sdufour@mun.ca>

Subject: Consultation on Calendar Changes - Biology Importance: High

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.

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

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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 From:
 Catto, Norm

 To:
 Burke, Charlene; Jody-Lynn Burke

 Subject:
 RE: Consultation on Calendar Changes - Biology

 Date:
 Wednesday, October 9, 2019 7:54:30 AM

No issues from HSS. Geography may apply to cross-list "Biology of Islands" at a later time, but not immediately.

Norm Catto Head, Department of Geography Memorial University St. John's NL A1B 3X9 Canada 1-709-864-7463 Fax 1-709-864-3119

From: Burke, Charlene <charlenes@mun.ca>
Sent: Tuesday, October 8, 2019 2:53 PM
To: Catto, Norm <ncatto@mun.ca>
Subject: FW: Consultation on Calendar Changes - Biology
Importance: High

Hello Dr. Catto,

Is this something that needs to be reviewed by CPC?

Charlene

From: Jody-Lynn Burke <jrotchford@mun.ca</pre>

Sent: Tuesday, October 8, 2019 2:15 PM

To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Bauer, Larry <<u>lbauer@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; engrconsult@mun.ca; lrobinson@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; Rohr, Linda <<u>lerohr@mun.ca</u>>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D<<isutherland@mun.ca>; DeanNurse <<u>DeanNurse@mun.ca</u>>; pharminfo@mun.ca; Dean of Science<<<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence<<<u>univlib@mun.ca</u>>
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Download Navigate for students now www.mun.ca/success From:Rohr, LindaTo:Jody-Lynn BurkeSubject:Re: Consultation on Calendar Changes - BiologyDate:Tuesday, October 15, 2019 9:44:17 PM

Hi,

No concerns from HKR with the proposed changes to Biology courses.

Linda

Linda E. Rohr PhD Dean, School of Human Kinetics & Recreation Memorial University t: 709.864.8129 f: 709.864.7531 e: <u>lerohr@mun.ca</u> PE 2027

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Department of Biology, Memorial University Office: (709) 864 8021 E-mail: jodyb@mun.ca



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Engineering Consult
Jody-Lynn Burke
Edmunds, Jayde; Peters, Dennis; Bruce Quinton
Re: Consultation on Calendar Changes - Biology
Wednesday, October 23, 2019 3:03:10 PM
High

Dear Ms. Burke,

Thank you for the opportunity to comment on the sets of Calendar change documents for BIOL 1001, 1002, 4005, 4052 and 4620

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 2019-10-08 14:14, Jody-Lynn Burke wrote: > Dear colleagues, > > The purpose of this email is to extend an opportunity for you to > provide feedback on the attached calendar change proposals. Please > find attached proposals relating to: > * Updated Calendar description for BIOL 1001 & 1002 > * Updated Calendar description for BIOL 4620 > * New Course - BIOL 4005 > * New Course - BIOL 4052 > > > Your feedback, at your earliest convenience, is appreciated. > > If you have any questions, please don't hesitate to contact me. >> 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 >> [1] > > > > Links:

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:

- \Box New course(s):
- ×Amended or deleted course(s): BIOL 1001 and 1002
- □ 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

BIOL 1001 Principles of Biology BIOL 1002 Principles of Biology

RATIONALE

The Department of Biology would like to update the credit hour usage limitation on Biology 1001 and 1002. Currently, credit may be obtained for only 6 1000 level credit hours in Biology. The department would like to amend this to restrict the usage limitation to Biology Majors, Joint Majors, Honours, Joint Honours and Minors.

CALENDAR CHANGES

11.2 Biology

www.mun.ca/biology

The following undergraduate programs are available in the Department:

- 1. Biochemistry and Cell Biology Joint Honours
- 2. Biology and Earth Sciences (Geology) Joint Honours
- 3. Biology and Psychology Joint Honours
- 4. Biology and Psychology (Behavioural Neuroscience) Joint Honours
- 5. Biology and Statistics Joint Honours
- 6. Biology Concentrations
- 7. Joint Major or Joint Honours in Marine Biology
- 8. Major or Honours, or Major (Co-operative) or Honours (Co-operative), in Biology
- 9. Minor in Biology

Details of joint programs are given in **Joint Program Regulations**.

Biology course descriptions are found at the end of the Faculty of Science section under **Course Descriptions**, **Biology**.

For the purposes of a Major, or Honours degree in Biology, Medicine 310A/B count as Biology courses.

Only 6 credit hours in Biology courses at the 1000 level will be awarded for a major, joint major, honours, joint honours or minor in Biology.

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.

1001 Principles of Biology

is an introduction to the science of Biology, including a discussion of the unity, diversity and evolution of living organisms.

LH: 3

PR: Science 1807 and Science 1808

UL: credit may be obtained for only 6 1000-level credit hours in Biology

1002 Principles of Biology

is an introduction to the science of Biology, including a discussion of the unity, diversity and evolution of living organisms.

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001

UL: credit may be obtained for only 6 1000-level credit hours in Biology

CALENDAR ENTRY AFTER CHANGES

11.2 Biology

www.mun.ca/biology

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PR: Science 1807 and Science 1808; BIOL 1001

SECONDARY CALENDAR CHANGES

13 Course Descriptions

In accordance with Senate's Policy Regarding Inactive Courses, the course descriptions for courses which have not been offered in the previous three academic years and which are not scheduled to be offered in the current academic year have been removed from the following listing. For information about any of these inactive courses, please contact the appropriate Dean of the School.

Prerequisites may be waived by the Dean/Program Chair of the course area in question.

Upon the recommendation of the appropriate Program Chair(s), any Major requirements may be waived by the relevant Committee on Student Academic Affairs (for the School of Arts and Social Science or School of Science and the Environment) or the Academic Studies Committee (for the School of Fine Arts).

Some of the courses in this section of the Calendar are available only at Grenfell Campus. Students who choose to transfer from Grenfell Campus to the St. John's campus should see their faculty advisor to determine the extent to which such courses can be applied to their new program.

13.3 Biology

Students may obtain credit for only 6 1000-level credit hours in Biology. Only 6 credit hours in Biology courses at the 1000 level will be awarded for a major, joint major, honours, joint honours or minor in Biology. Normally, these courses will be Biology 1001-1002, which are prerequisite to all higher courses in Biology, except where noted below.

Biology courses are designated by BIOL.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Academic Unit	Response Received
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	
Grenfell Campus:	
Fine Arts	
Human Kinetics and Recreation	
Marine Institute	
Medicine	
Music	
Nursing	
Pharmacy	
Science	
Chemistry	
Math	
Ocean Sciences	
Social Work	

Library

RESOURCE IMPLICATIONS

No resource implications.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS NA

From:	Davis,Erin
То:	Jody-Lynn Burke
Subject:	Consultation on Calendar Changes - Biology
Date:	Wednesday, October 9, 2019 8:41:23 AM
Attachments:	BIOL 1001 & 1002 Updated Description.pdf BIOL 4620 Updated Description.pdf New Course - BIOL 4005.pdf New Course - BIOL 4052.pdf
Importance:	High

Hi Jody,

Thank you for forwarding these changes for our consideration. We don't see any impact on Pharmacy and therefore have no concerns.

Erin --

Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca Hi Jody-Lynn,

Just dropping a quick line to let you know you can replace Dr. Larry Bauer's name on your distribution list with mine. I am now responsible for all academic programs in the Business faculty.

Many thanks and best regards.

Rachelle

Rachelle J. Shannahan, PhD Associate Dean, Academic Programs Faculty of Business Administration Memorial University of Newfoundland

rshannahan@mun.ca

From: Lawrence Bauer [mailto:lbauer@mun.ca]
Sent: Tuesday, October 8, 2019 4:12 PM
To: Shannahan, Rachelle <rshannahan@mun.ca>
Subject: Fwd: Consultation on Calendar Changes - Biology
Importance: High

Begin forwarded message:

From: Jody-Lynn Burke <<u>irotchford@mun.ca</u>> Subject: Consultation on Calendar Changes - Biology Date: October 8, 2019 at 2:14:55 PM NDT To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>, "Bauer, Larry" <<u>lbauer@mun.ca</u>>, "Collett, Meghan" <<u>mcollett@mun.ca</u>>, "engrconsult@mun.ca" <engrconsult@mun.ca>, "lrobinson@grenfell.mun.ca" <<u>lrobinson@grenfell.mun.ca</u>>, "<u>ssedean@grenfell.mun.ca</u>" <<u>ssedean@grenfell.mun.ca</u>>, "<u>thennessey@grenfell.mun.ca</u>" <<u>thennessey@grenfell.mun.ca></u>, "Rohr, Linda" <<u>lerohr@mun.ca</u>>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>, "deanofmedicine@med.mun.ca" <deanofmedicine@med.mun.ca>, "Sutherland, Ian D" <<u>isutherland@mun.ca</u>>, DeanNurse <<u>DeanNurse@mun.ca</u>>, "<u>pharminfo@mun.ca</u>" <<u>pharminfo@mun.ca</u>>, Dean of Science <<u>deansci@mun.ca</u>>, adeanugradswk <<u>adeanugradswk@mun.ca</u>>, Library Correspondence <<u>univlib@mun.ca</u>> Cc: Suzanne Dufour <<u>sdufour@mun.ca</u>>

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Larry Bauer, Ph.D.

Associate Professor of Finance Faculty of Business Administration

Memorial University of Newfoundland St. John's Nfld, A1B 3X5

www: <u>http://www.business.mun.ca</u> <u>e-mail: lbauer@mun.ca</u> Tel: (709) 864-3537 Fax: (709) 864-8954

SSRN: http://ssrn.com/author=327175

From:	<u>cvardy@mun.ca</u>
To:	Jody-Lynn Burke
Cc:	Margaret.Steele@med.mun.ca
Subject:	FW: Consultation on Calendar Changes - Biology
Date:	Thursday, October 17, 2019 11:05:49 AM
Attachments:	<u>ATT00001.htm</u>
	BIOL 1001 & 1002 Updated Description.pdf
	ATT00002.htm
	BIOL 4620 Updated Description.pdf
	ATT00003.htm
	New Course - BIOL 4005.pdf
	ATT00004.htm
	New Course - BIOL 4052.pdf
	ATT00005.htm

Good Day

The Faculty of Medicine supports the proposed calendar changes for Biology as per the attachments.

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

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Destination Excellence: Faculty of Medicine Strategic Plan 2018-2023

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From: Jody-Lynn Burke <jrotchford@mun.ca>

Date: October 8, 2019 at 2:14:55 PM NDT

To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>, "Bauer, Larry"

<<u>lbauer@mun.ca</u>>, "Collett, Meghan" <<u>mcollett@mun.ca</u>>, "<u>engrconsult@mun.ca</u>"

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"ssedean@grenfell.mun.ca" <ssedean@grenfell.mun.ca>,

"thennessey@grenfell.mun.ca" <thennessey@grenfell.mun.ca>, "Rohr, Linda"

<lerohr@mun.ca>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>,

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Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer Department of Biology, Memorial University Office: (709) 864 8021 E-mail: <u>jodyb@mun.ca</u>

Hello Jody-Lynn,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW

Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

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 To:
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Cc:	Edmunds, Jayde; Peters, Dennis; Bruce Quinton
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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 2019-10-08 14:14, Jody-Lynn Burke wrote: > Dear colleagues, > > The purpose of this email is to extend an opportunity for you to > provide feedback on the attached calendar change proposals. Please > find attached proposals relating to: > * Updated Calendar description for BIOL 1001 & 1002 > * Updated Calendar description for BIOL 4620 > * New Course - BIOL 4005 > * New Course - BIOL 4052 > > > Your feedback, at your earliest convenience, is appreciated. > > If you have any questions, please don't hesitate to contact me. >> 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 >> [1] > > > > Links:

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- □ 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

BIOL 4620 Ornithology

RATIONALE

To capitalize on the resources offered by all of Memorial's campuses (St. John's, Grenfell, and Harlow) and the Bonne Bay Marine Station, the course description has been modified to include a field course option and to indicate that identification of specimens will not be restricted to those of Eastern Canada.

These modifications will allow more freedom for the course to be offered outside the St. John's campus and provide students with the opportunity to study live and preserved specimens that may not available at the St. John's campus.

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.

4620 Ornithology

examines structure, classification, evolution, ecology and behaviour of birds, with particular reference to those of economic importance. Identification of the birds of Eastern Canada. Identification of representative Orders, Families and species of birds. LH: 3

LH: either three hours of lecture and three hours of laboratory per week or a two week field course that embodies equivalent instructional time

PR: Science 1807 and Science 1808; BIOL 2210 and 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.

4620 Ornithology

examines structure, classification, evolution, ecology and behaviour of birds, with particular reference to those of economic importance. Identification of representative Orders, Families and species of birds.

LH: either three hours of lecture and three hours of laboratory per week or a two week field course that embodies equivalent instructional time

PR: Science 1807 and Science 1808; BIOL 2210 and 2600

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Academic Unit	Response Received
Humanities and Social Sciences	No
Business Administration	Yes
Education	No
Engineering and Applied Science	Yes
Grenfell Campus:	No
Fine Arts	
Human Kinetics and Recreation	Yes
Marine Institute	No
Medicine	Yes
Music	No
Nursing	No
Pharmacy	Yes
Science Geography	Yes
Social Work	Yes

Library	Yes

RESOURCE IMPLICATIONS

No resource implications.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS NA

From:	Davis,Erin
То:	Jody-Lynn Burke
Subject:	Consultation on Calendar Changes - Biology
Date:	Wednesday, October 9, 2019 8:41:23 AM
Attachments:	BIOL 1001 & 1002 Updated Description.pdf BIOL 4620 Updated Description.pdf New Course - BIOL 4005.pdf New Course - BIOL 4052.pdf
Importance:	High

Hi Jody,

Thank you for forwarding these changes for our consideration. We don't see any impact on Pharmacy and therefore have no concerns.

Erin

--Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca Hi Jody-Lynn,

Just dropping a quick line to let you know you can replace Dr. Larry Bauer's name on your distribution list with mine. I am now responsible for all academic programs in the Business faculty.

Many thanks and best regards.

Rachelle

Rachelle J. Shannahan, PhD Associate Dean, Academic Programs Faculty of Business Administration Memorial University of Newfoundland

rshannahan@mun.ca

From: Lawrence Bauer [mailto:lbauer@mun.ca]
Sent: Tuesday, October 8, 2019 4:12 PM
To: Shannahan, Rachelle <rshannahan@mun.ca>
Subject: Fwd: Consultation on Calendar Changes - Biology
Importance: High

Begin forwarded message:

From: Jody-Lynn Burke <<u>irotchford@mun.ca</u>> Subject: Consultation on Calendar Changes - Biology Date: October 8, 2019 at 2:14:55 PM NDT To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>, "Bauer, Larry" <<u>lbauer@mun.ca</u>>, "Collett, Meghan" <<u>mcollett@mun.ca</u>>, "engrconsult@mun.ca" <engrconsult@mun.ca>, "lrobinson@grenfell.mun.ca" <<u>lrobinson@grenfell.mun.ca</u>>, "<u>ssedean@grenfell.mun.ca</u>" <<u>ssedean@grenfell.mun.ca</u>>, "<u>thennessey@grenfell.mun.ca</u>" <<u>thennessey@grenfell.mun.ca></u>, "Rohr, Linda" <<u>lerohr@mun.ca</u>>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>, "deanofmedicine@med.mun.ca" <deanofmedicine@med.mun.ca>, "Sutherland, Ian D" <<u>isutherland@mun.ca</u>>, DeanNurse <<u>DeanNurse@mun.ca</u>>, "<u>pharminfo@mun.ca</u>" <<u>pharminfo@mun.ca</u>>, Dean of Science <<u>deansci@mun.ca</u>>, adeanugradswk <<u>adeanugradswk@mun.ca</u>>, Library Correspondence <<u>univlib@mun.ca</u>> Cc: Suzanne Dufour <<u>sdufour@mun.ca</u>>

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.

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

Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer Department of Biology, Memorial University Office: (709) 864 8021 E-mail: <u>iodyb@mun.ca</u>



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Larry Bauer, Ph.D.

Associate Professor of Finance Faculty of Business Administration

Memorial University of Newfoundland St. John's Nfld, A1B 3X5

www: <u>http://www.business.mun.ca</u> <u>e-mail: lbauer@mun.ca</u> Tel: (709) 864-3537 Fax: (709) 864-8954

SSRN: http://ssrn.com/author=327175

<u>cvardy@mun.ca</u>
Jody-Lynn Burke
Margaret.Steele@med.mun.ca
FW: Consultation on Calendar Changes - Biology
Thursday, October 17, 2019 11:05:49 AM
ATT00001.htm
BIOL 1001 & 1002 Updated Description.pdf
ATT00002.htm
BIOL 4620 Updated Description.pdf
ATT00003.htm
New Course - BIOL 4005.pdf
ATT00004.htm
New Course - BIOL 4052.pdf
ATT00005.htm

Good Day

The Faculty of Medicine supports the proposed calendar changes for Biology as per the attachments.

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

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From: Jody-Lynn Burke <<u>jrotchford@mun.ca</u>>

Date: October 8, 2019 at 2:14:55 PM NDT

To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>, "Bauer, Larry"

<<u>lbauer@mun.ca</u>>, "Collett, Meghan" <<u>mcollett@mun.ca</u>>, "<u>engrconsult@mun.ca</u>"

<<u>engrconsult@mun.ca</u>>, "<u>lrobinson@grenfell.mun.ca</u>" <<u>lrobinson@grenfell.mun.ca</u>>,

"ssedean@grenfell.mun.ca" <ssedean@grenfell.mun.ca>,

"thennessey@grenfell.mun.ca" <thennessey@grenfell.mun.ca>, "Rohr, Linda"

<lerohr@mun.ca>, "miugconsultations@mi.mun.ca" <miugconsultations@mi.mun.ca>,

"<u>deanofmedicine@med.mun.ca</u>" <<u>deanofmedicine@med.mun.ca</u>>, "Sutherland, Ian D"

<<u>isutherland@mun.ca</u>>, DeanNurse <<u>DeanNurse@mun.ca</u>>, "<u>pharminfo@mun.ca</u>" <<u>pharminfo@mun.ca</u>>, Dean of Science <<u>deansci@mun.ca</u>>, adeanugradswk <<u>adeanugradswk@mun.ca</u>>, Library Correspondence <<u>univlib@mun.ca</u>> **Cc:** Suzanne Dufour <<u>sdufour@mun.ca</u>>

Subject: Consultation on Calendar Changes - Biology

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.

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

Jody Burke, BSc.(Hons), M.Ed, PGC(QM) – Academic Program Officer Department of Biology, Memorial University Office: (709) 864 8021 E-mail: <u>jodyb@mun.ca</u>

Hello Jody-Lynn,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW

Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

From: Jody-Lynn Burke <jrotchford@mun.ca>

Sent: October 8, 2019 2:15 PM

To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Bauer, Larry <lbauer@mun.ca>; Collett, Meghan <mcollett@mun.ca>; engrconsult@mun.ca; lrobinson@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; Rohr, Linda <lerohr@mun.ca>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D <isutherland@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>
Ce: Suzanne Dufour <sdufour@mun.ca>

Subject: Consultation on Calendar Changes - Biology Importance: High

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.

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

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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 From:
 Catto, Norm

 To:
 Burke, Charlene; Jody-Lynn Burke

 Subject:
 RE: Consultation on Calendar Changes - Biology

 Date:
 Wednesday, October 9, 2019 7:54:30 AM

No issues from HSS. Geography may apply to cross-list "Biology of Islands" at a later time, but not immediately.

Norm Catto Head, Department of Geography Memorial University St. John's NL A1B 3X9 Canada 1-709-864-7463 Fax 1-709-864-3119

From: Burke, Charlene <charlenes@mun.ca>
Sent: Tuesday, October 8, 2019 2:53 PM
To: Catto, Norm <ncatto@mun.ca>
Subject: FW: Consultation on Calendar Changes - Biology
Importance: High

Hello Dr. Catto,

Is this something that needs to be reviewed by CPC?

Charlene

From: Jody-Lynn Burke <jrotchford@mun.ca</pre>

Sent: Tuesday, October 8, 2019 2:15 PM

To: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Bauer, Larry <<u>lbauer@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; engrconsult@mun.ca; lrobinson@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; Rohr, Linda <<u>lerohr@mun.ca</u>>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Sutherland, Ian D<<isutherland@mun.ca>; DeanNurse <<u>DeanNurse@mun.ca</u>>; pharminfo@mun.ca; Dean of Science<<<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence<<<u>univlib@mun.ca</u>>
Cc: Suzanne Dufour <<u>sdufour@mun.ca</u>>

Subject: Consultation on Calendar Changes - Biology **Importance:** High

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.

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

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

Department of Biology, Memorial University Office: (709) 864 8021 E-mail: <u>iodyb@mun.ca</u>



GET ONE-STOP PERSONALIZED INFORMATION DISCOVER SUPPORTIVE RESOURCES ON CAMPUS TRACK DATES AND DEADLINES

Download Navigate for students now www.mun.ca/success From:Rohr, LindaTo:Jody-Lynn BurkeSubject:Re: Consultation on Calendar Changes - BiologyDate:Tuesday, October 15, 2019 9:44:17 PM

Hi,

No concerns from HKR with the proposed changes to Biology courses.

Linda

Linda E. Rohr PhD Dean, School of Human Kinetics & Recreation Memorial University t: 709.864.8129 f: 709.864.7531 e: <u>lerohr@mun.ca</u> PE 2027

Dear colleagues,

The purpose of this email is to extend an opportunity for you to provide feedback on the attached calendar change proposals. Please find attached proposals relating to:

- Updated Calendar description for BIOL 1001 & 1002
- Updated Calendar description for BIOL 4620
- New Course BIOL 4005
- New Course BIOL 4052

Your feedback, at your earliest convenience, is appreciated.
If you have any questions, please don't hesitate to contact me.

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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From:	Engineering Consult
То:	Jody-Lynn Burke
Cc:	Edmunds, Jayde; Peters, Dennis; Bruce Quinton
Subject:	Re: Consultation on Calendar Changes - Biology
Date:	Wednesday, October 23, 2019 3:03:10 PM
Importance:	High

Dear Ms. Burke,

Thank you for the opportunity to comment on the sets of Calendar change documents for BIOL 1001, 1002, 4005, 4052 and 4620

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 2019-10-08 14:14, Jody-Lynn Burke wrote: > Dear colleagues, > > The purpose of this email is to extend an opportunity for you to > provide feedback on the attached calendar change proposals. Please > find attached proposals relating to: > * Updated Calendar description for BIOL 1001 & 1002 > * Updated Calendar description for BIOL 4620 > * New Course - BIOL 4005 > * New Course - BIOL 4052 > > > Your feedback, at your earliest convenience, is appreciated. > > If you have any questions, please don't hesitate to contact me. > > 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 >> [1] > > > > Links:

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:

- \Box New course(s):
- \Box Amended or deleted course(s):
- □ New program(s):
- X 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 Programs

PROGRAM TITLE

General Degree – Major in Computational Chemistry AND Honours Degree in Computational Chemistry

RATIONALE

 The Department of Computer Science made significant changes to their programs for the 2019-2020 Calendar year. As part of these changes, new courses were introduced, and a new prerequisite structure for existing courses was introduced. These changes have impacted programs in Computational Chemistry as required courses in those programs have new Computer Science prerequisites that are not currently themselves required courses in the programs.

The new course Computer Science 1003 was added as a prerequisite to Computer Science 2001 and 2002, and this course has the additional corequisite of Computer Science 1002 or Mathematics 2320, neither of which is currently required in the computational chemistry programs.

Therefore, the courses Computer Science 1003 and 1002 must be added as required courses in the computational chemistry programs to ensure students have all prerequisites for the second-year computer science courses. Computer Science 1002 was chosen over Math 2320 because it has no prerequisite, whereas Math 2320 would require prerequisites that would limit the ability for students of the computational chemistry programs to take computer science courses early in their programs, and potentially make the programs untenable in four years.

- 2. The course Computer Science 2500 is a required course in the computational chemistry programs but is not a required course for computer science students. As a service course to other programs, Computer Science 2500 might not be offered routinely (depending on demand and staffing), again making computational chemistry students less agile in their timetabling. Therefore, computational chemistry students will now be allowed a choice for Computer Science 2500 OR Computer Science 2002 to be taken. As Computer Science 2002 is a required course for many computer science programs, it is very likely to be offered regularly.
- 3. With the addition of two new computer science courses to the programs, the Honours program in Computational Chemistry no longer requires that three additional credit hours in Biochemistry, Chemistry, Computer Science,

Mathematics or Physics at the 2000 level or above be taken to ensure the minimum credit hours requirement that not fewer than 84 credit hours in the Major subjects is met. This choice is removed from the Honours program. Additionally, since there is no choice to be made, clause 11.3.7.3.7 which would allow students to choose a graduate course to fulfill this choice of courses is no longer required.

- 4. In the Required Courses clauses for the Honours Computational Chemistry degree, there is a clause that indicates that a sufficient number of elective courses are required to bring the degree up to a total of 120 credit hours. This clause is redundant in relation to the Hounours degree regulations for the Faculty of Science and has an unintended consequence regarding Honours standing (see 5), so this clause is removed.
- 5. In the Other Information section regarding the Honours Computational Chemistry degree program, Clause 11.3.7.3.1 currently indicates that the courses used to determine Honours standing for the program are "the courses beyond first year used to satisfy the required course list." This means that all 2000 level and above Chemistry, Physics, Biochemistry, Computer Science and Mathematics courses, as well as all 2000 level and above electives (due to item 4 above) would be used to calculate Honours standing. In the current program, that would mean a minimum of 63 credit hours are used to determine Honours standing for an Honours in Computational Chemistry. Comparatively, the current Honours degree in Chemistry uses 39 credit hours to determine Honours standing. Therefore Clause 11.3.7.3.1 is modified so that only chemistry courses of 2000 level and above are used to determine Honours for the Computational Chemistry Honours. This will bring the number of credit hours for Honours standing determination in line with that for the Honours in Chemistry.
- 6. Currently the computational chemistry programs allow for Physics 1050 (or 1020) and Physics 1051 (or 1021) to be used as the required physics courses. However, the additional required physics course Physics 2820 has prerequisites of Math 2000 AND Physics 1051, which means Physics 1021 is not allowed to fulfill the prerequisite to get into a required course. Therefore, computational chemistry students must be required to take Physics 1051 and not 1021. Entrance to Physics 1051 can be made by students who successfully complete Physics 1020 with a minimum grade of 70%, so the physics course requirements to the programs have been modified to clearly show what courses are required to meet prerequisites.
- 7. In the Suggested Program of Study for both Programs, the courses Computer Science 1510 and 1001 have been reversed in order. As the other clauses of the Suggested Programs are for complementary first year courses to normally be taken in the Fall and Winter semesters, this change would indicate that Computer Science 1001 is encouraged to be taken in the Fall and 1510 in the Winter.

CALENDAR CHANGES

11.3.6 General Degree - Major in Computational Chemistry

Students wishing to take a Major in Computational Chemistry should consult those regulations of the Calendar dealing with **Degree Regulations** for the General Degree of Bachelor of Science.

11.3.6.1 Required Courses

- 1. Chemistry 1050 and 1051 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3210 or 3211, 3303, 4304, 4305.
- 2. Physics 1050 (or 1020) and 1051 (or 1021), and 2820.
- 3. Mathematics 1000, 1001, 2000, 2050, 2051, 2260 (or the former Mathematics 3260), and 3202.
- 4. Computer Science 1510 and 1001 and 1002 and 1003.
- 5. Computer Science 2500 and 2001 or Computer Science 2002.
- 6. Computer Science 2001
- 7. Computer Science 3731 or Mathematics 3132.
- 8. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 9. A sufficient number of elective courses to bring the degree up to a total of 120 credit hours must also be completed.

11.3.6.2 Suggested Program of Study

Given appropriate circumstances the Major in Computational Chemistry program can be completed in four years. While students should consult the Undergraduate Handbook for further timetabling details, to complete the program in four years generally will require that students take the following courses in their first year:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 2. Chemistry 1050 and 1051 (or 1200 and 1001).
- 3. Physics 1050 (or 1020) and 1051. (or 1021).
- 4. Mathematics 1000 and 1001.
- 5. Computer Science 1510 and 1001 1001 and 1510.

11.3.7 Honours Degree in Computational Chemistry

Students wishing to take Honours in Computational Chemistry should consult those sections of the Calendar dealing with **Degree Regulations** for the Honours Degree of Bachelor of Science.

11.3.7.1 Required Courses

- 1. Chemistry 1050 and 1051 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3210 or 3211, 3303, 4304, and 4305.
- 2. Physics 1050 (or 1020) and 1051 (or 1021), and 2820.
- 3. Mathematics 1000, 1001, 2000, 2050, 2051, 2260 (or the former Mathematics 3260), and 3202.

- 4. Computer Science 1510 and 1001 and 1002 and 1003.
- 5. Computer Science 2500 and 2001 or Computer Science 2002.
- 6. Computer Science 2001
- 7. Computer Science 3731 or Mathematics 3132.
- 8. Chemistry 490A/B.
- 9. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 9. 3 additional credit hours in Biochemistry, Chemistry, Computer Science, Mathematics, or Physics at the 2000 level or above.
- 10.A sufficient number of elective courses to bring the degree up to a total of 120 credit hours must also be completed.

11.3.7.2 Suggested Program of Study

Given appropriate circumstances the Honours in Computational Chemistry program can be completed in four years. While students should consult the Undergraduate Handbook for further timetabling details, to complete the program in four years generally will require that students take the following courses in their first year:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 2. Chemistry 1050 and 1051 (or 1200 and 1001).
- 3. Physics 1050 (or 1020) and 1051 (or 1021).
- 4. Mathematics 1000 and 1001.
- 5. Computer Science 1510 and 1001 1001 and 1510.

11.3.7.3 Other Information

- Those courses in which a grade of B or an average of 75% or higher are required, as specified under <u>Academic Standing</u> in the <u>Degree</u> <u>Regulations</u> for the Honours Degree of Bachelor of Science, are the courses beyond first year used to satisfy the required course list.
- <u>1.</u> A thesis based on a selected research topic carried out under the supervision of a member of the Department is to be submitted in the final year.
- 2. Chemistry 490A/B will normally require the equivalent of nine hours per week for two semesters. Registration in Chemistry 490A/B is restricted to those students who have honours standing. The Honours dissertation will be assessed by a committee comprising the supervisor and one other faculty member.
- <u>3.</u> Students completing first year requirements for any of Chemistry, Mathematics or Physics via the three course options (i.e. Chemistry 1010, 1050, 1051, Mathematics 1090, 1000, 1001 or 109A/B, 1000, 1001, Physics 1020, 1021, 1051) instead of the two course options (Chemistry 1050, 1051, Chemistry 1200, 1001,

Mathematics 1000, 1001, Physics 1050, 1051) will require the corresponding number of extra credits to obtain an Honours degree.

- <u>4.</u> Arrangements for subsequent years will depend on the other science subjects being studied and should be made in consultation with the <u>a</u> Faculty Advisor.
- 5. Certain advanced courses may only be offered in alternate years. Candidates therefore should consult the Head of the Department before registration.
- <u>7.</u>-Certain Graduate courses may be taken in the final year of the Honours Program with the permission of the Head of the Department.

CALENDAR ENTRY AFTER CHANGES

11.3.6 General Degree - Major in Computational Chemistry

Students wishing to take a Major in Computational Chemistry should consult those regulations of the Calendar dealing with **Degree Regulations** for the General Degree of Bachelor of Science.

11.3.6.1 Required Courses

- 1. Chemistry 1050 and 1051 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3210 or 3211, 3303, 4304, 4305.
- 2. Physics 1050 (or 1020) and 1051, and 2820.
- 3. Mathematics 1000, 1001, 2000, 2050, 2051, 2260 (or the former Mathematics 3260), and 3202.
- 4. Computer Science 1510 and 1001 and 1002 and 1003.
- 5. Computer Science 2500 or Computer Science 2002.
- 6. Computer Science 2001
- 7. Computer Science 3731 or Mathematics 3132.
- 8. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.

11.3.6.2 Suggested Program of Study

Given appropriate circumstances the Major in Computational Chemistry program can be completed in four years. While students should consult the Undergraduate Handbook for further timetabling details, to complete the program in four years generally will require that students take the following courses in their first year:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 2. Chemistry 1050 and 1051 (or 1200 and 1001).
- 3. Physics 1050 (or 1020) and 1051.
- 4. Mathematics 1000 and 1001.
- 5. Computer Science 1001 and 1510.

11.3.7 Honours Degree in Computational Chemistry

Students wishing to take Honours in Computational Chemistry should consult those sections of the Calendar dealing with **Degree Regulations** for the Honours Degree of Bachelor of Science.

11.3.7.1 Required Courses

- 1. Chemistry 1050 and 1051 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3210 or 3211, 3303, 4304, and 4305.
- 2. Physics 1050 (or 1020) and 1051, and 2820.
- 3. Mathematics 1000, 1001, 2000, 2050, 2051, 2260 (or the former Mathematics 3260), and 3202.
- 4. Computer Science 1510 and 1001 and 1002 and 1003.
- 5. Computer Science 2500 or Computer Science 2002.

- 6. Computer Science 2001
- 7. Computer Science 3731 or Mathematics 3132.
- 8. Chemistry 490A/B.
- 9. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.

11.3.7.2 Suggested Program of Study

Given appropriate circumstances the Honours in Computational Chemistry program can be completed in four years. While students should consult the Undergraduate Handbook for further timetabling details, to complete the program in four years generally will require that students take the following courses in their first year:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 2. Chemistry 1050 and 1051 (or 1200 and 1001).
- 3. Physics 1050 (or 1020) and 1051.
- 4. Mathematics 1000 and 1001.
- 5. Computer Science 1001 and 1510.

11.3.7.3 Other Information

- 1. A thesis based on a selected research topic carried out under the supervision of a member of the Department is to be submitted in the final year.
- 2. Chemistry 490A/B will normally require the equivalent of nine hours per week for two semesters. Registration in Chemistry 490A/B is restricted to those students who have honours standing. The Honours dissertation will be assessed by a committee comprising the supervisor and one other faculty member.
- Students completing first year requirements for any of Chemistry, Mathematics or Physics via the three course options (i.e. Chemistry 1010, 1050, 1051, Mathematics 1090, 1000, 1001 or 109A/B, 1000, 1001, Physics 1020, 1021, 1051) instead of the two course options (Chemistry 1050, 1051, Chemistry 1200, 1001, Mathematics 1000, 1001, Physics 1050, 1051) will require the corresponding number of extra credits to obtain an Honours degree.
- 4. Arrangements for subsequent years will depend on the other science subjects being studied and should be made in consultation with a Faculty Advisor.
- 5. Certain advanced courses may only be offered in alternate years. Candidates therefore should consult the Head of the Department before registration.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From

Comments Received

Dusiness	NO
Business	NU
Education	NO
Engineering	YES – no concerns
Grenfell Campus, Science and the Envi	ronment
Chemistry	YES – no concerns
Human Kinetics and Recreation	YES – no concerns
Humanities and Social Sciences	NO
Marine Institute	YES – no concerns
Medicine	YES – no concerns
Music	NO
Nursing	NO
Pharmacy	YES – no concerns
Science	YES – no concerns
Biochemistry	NO
Biology	YES – no concerns
Computer Science	YES – no concenrns
Earth Sciences	NO
Economics	NO
Geography	NO
Mathematics	NO
Ocean Sciences	YES – no concerns
Physics	NO
Psychology	NO
Science	NO
Social Work	YES – no concerns

From:	chemconsult@mun.ca
Sent:	Tuesday, October 22, 2019 9:11 AM
То:	Business Administration; Education; Engineering and Applied Science; Grenfell Science
and the Environment; Hu	Iman Kinetics and Recreation; Humanities and Social Sciences; Library; Marine Institute; Medicine;
Music; Nursing; Pharma	cy; Science; Social Work
Cc:	'chemconsult@mun.ca'
Subject:	Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchar	nges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hello colleagues,

Please find attached three proposal documents for changes to the Chemistry calendar entries.

Document 1 outlines changes needed for the degree programs in Computational Chemistry. Document 2 outlines changed proposed for degree programs in Chemistry (Biological) Document 3 outlines minor bookkeeping changes (minor prerequisite changes, typo fixes and course recommendations added to programs).

Please forward any comments to <u>chemconsult@mun.ca</u>. Please also direct any questions to me at that address as well.

Thanks everyone for your time and efforts!

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry				
Memorial University of Newfoundla	nd			
St. John's, Newfoundland and Labrad	lor A1B 3X7			
Chemistry-Physics	Room C 2020	T 709 864 6939		F 709 864 3702

Peter Warburton

From:	Peter Warburton <peterw@mun.ca></peterw@mun.ca>
Sent:	Wednesday, October 23, 2019 10:47 AM
То:	Power, Barry P
Subject:	Re: Proposed Calendar changes from Chemistry

Yeah we can remove "only". My biggest reason for the change is that if we allow non-Honours students to be signed in it would be best if the prerequisite formally say that. So we can remove the UL as well...

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

On Oct 23, 2019, at 10:40 AM, Power, Barry P <b.power@mun.ca> wrote:

Hi Peter,

I had a read through 490A/B the description again, and I understand the point about the first line in the description, "is available only to students in Chemistry Honours or Chemistry Joint Honours Programs". I think we could just remove the word "only" and be done with it.

Perhaps the UL could come out altogether as well? Saying that non-honours students can be signed in I don't think would constitute a "usage limitation," do you? I think it's more appropriate to state that in the pre-requisites instead, as we are proposing to do.

We'll figure out the bureaucracy of the calendar eventually...

```
Barry
```

BARRY POWER, PhD MANAGER OF ACADEMIC PROGRAMS / PER COURSE INSTRUCTOR

Departments of Chemistry and Earth SciencesMemorial University of NewfoundlandSt. John's, Newfoundland and Labrador| A1B 3X7Chemistry-Physics| Room C 2053 | T 709 864 8083 | F 709 864 3702Earth Sciences| Room ER 4063C | T 709 864 4464 | F 709 864 2589

From: Peter Warburton <peterw@mun.ca> Sent: Wednesday, October 23, 2019 10:19 AM To: Associate Dean of Science (Undergraduate) <adsu@mun.ca> Cc: Power, Barry P <b.power@mun.ca> Subject: Re: Proposed Calendar changes from Chemistry

My intention was to "formally" allow permission as a prerequisite for non-Honours students to be signed in. I must have missed the first part of the PR when I put the document together.

We can amend the language at meeting to clear that up, I assume?

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

On Oct 23, 2019, at 10:10 AM, Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> wrote:

Hi Peter,

That wasn't my intent! If you would prefer the statement in the PR rather than UL then that is fine, but it really doesn't change it. It might be worthwhile thinking of changing the first sentence in the description to lighten it a bit, say remove the word "only".

Т

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

From: Peter Warburton <<u>peterw@mun.ca</u>> Sent: Wednesday, October 23, 2019 10:07 AM To: Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> Cc: Power, Barry P <<u>b.power@mun.ca</u>> Subject: Re: Proposed Calendar changes from Chemistry

Fair enough. We can remove that change...

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702 Hi Peter and Barry,

This is about the change to CHEM 490.

The new statement makes the UL statement redundant. Also, it is inconsistent with the first sentence in the course description;

"is available only to students in Chemistry Honours or Chemistry Joint Honours Programs."

Furthermore, the new statement does nothing to aid students getting into the program easier as with that statement in the PR or the UL, students still need to be signed in.

4

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

Peter Warburton

From:	Associate Dean of Science (Undergraduate) <adsu@mun.ca></adsu@mun.ca>
Sent:	Wednesday, October 23, 2019 9:09 PM
То:	Peter Warburton
Subject:	RE: Proposed Calendar changes from Chemistry

I know, I plagiarized your request as you might have guessed from the copy and paste wording...the special appeals committee of FoSCUgS also suggested it. What I would do is take my comment, get approval from Sunil if he approves, and have see if the chemistry CUgS also agrees and just amend the proposal so it all goes to FoSCUgS at the November meeting and then Faculty Council.

Т

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

From: Peter Warburton <peterw@mun.ca> Sent: Wednesday, October 23, 2019 5:13 PM To: Associate Dean of Science (Undergraduate) <adsu@mun.ca> Cc: Power, Barry P <b.power@mun.ca> Subject: Re: Proposed Calendar changes from Chemistry

Funny, We just did that as a course substitution for a student!

The changes I put forward were what we had on file. Can certainly amend that one in at the meeting as well.

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T <u>709 864 6939</u> |<u>F 709 864 3702</u>

On Oct 23, 2019, at 3:40 PM, Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> wrote:

Hi Peter and Barry,

This email is about the Chemistry (Biological) program.

Has the department considered adding Biology 4200 (Immunology) to the list of biology courses in 11.3.8.1.3 and 11.3.9.1.4? The course description of Immunology includes "(t)he molecular and cellular basis of allergy, autoimmunity, vaccination and cancer immunology will also be discussed" and so it would fit well within the program.

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

Peter Warburton

From:	Rayner-Canham, Geoff <grcanham@grenfell.mun.ca></grcanham@grenfell.mun.ca>
Sent:	Friday, November 8, 2019 12:23 PM
То:	Peter Warburton
Subject:	Fw: Proposed Calendar changes from Chemistry

Hi again, Peter,

Robert is the Chair of the calendar change committee (or whatever it is called) and here is his suggestion which seems eminently sensible, for you to request the same change for the Grenfell section.

Geoff

From: Bailey, Robert F. <rbailey@grenfell.mun.ca> Sent: November 8, 2019 12:09 PM To: Rayner-Canham, Geoff <grcanham@grenfell.mun.ca> Cc: Warkentin, Ian <ian.warkentin@grenfell.mun.ca> Subject: RE: Proposed Calendar changes from Chemistry

Hi Geoff (and lan),

As I mentioned previously, for the changes to CHEM 2210, 2301, 2302 and 2400, it's probably best to request a secondary change for those Calendar entries in the Grenfell section, in order that the two campuses' entries remain consistent. Any other changes (e.g. to 2440, or first-year courses) can be made in a separate proposal and considered later.

Thanks, Robert.

EXAMPLE 2 Constraints of Newfoundland Corner Brook, NL A2H 6P9, Canada

Office: AS 3022 Phone: +1 (709) 637-6293 Web: <u>http://www2.grenfell.mun.ca/rbailey/</u>

Peter Warburton

From:	Peter Warburton <peterw@mun.ca></peterw@mun.ca>
Sent:	Friday, November 8, 2019 11:46 AM
То:	'Rayner-Canham, Geoff'
Subject:	RE: MUN-StJ Calendar amendments

Hi Geoff,

Thanks for the update on that. Once I have the "official" notification I will include that in the documents to go to FoSCUgS for approval.

And sounds very good on an informal look at any changes you have coming down the pipe. Resolving issues (hopefully unlikely) beforehand certainly makes sense.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry			
Memorial University of Newfor	undland		
St. John's, Newfoundland and L	abrador A1B 3X7		
Chemistry-Physics	Room C 2020	T 709 864 6939	F 709 864 3702

From: Rayner-Canham, Geoff <grcanham@grenfell.mun.ca> Sent: Friday, November 8, 2019 11:29 AM To: Peter Warburton <peterw@mun.ca> Subject: MUN-StJ Calendar amendments

Good day, Peter,

Just an informal message to let you know that the Grenfell Chemistry Group have met and we thank you for the amendment to the Chem 1001 requirement. All is good with the document from our perspective. You will have 'official' notification in due course.

We'll revise the Grenfell entries in about the next ten days (sooner if possible). I'll send them to you informally when they're ready just so that when they come through the 'official' channels any problems on your side have already been resolved.

Best wishes, Geoff

From:	Suzanne Dufour <sdufour@mun.ca></sdufour@mun.ca>
Sent:	Thursday, October 31, 2019 10:39 AM
То:	Department of Chemistry Consult; jody-Lynn Burke
Subject:	Fwd: FW: Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchan	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hi Peter,

The Biology Undergraduate Studies Committee has reviewed the proposed changes to Chemistry calendar entries. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Tel: (709) 864-8025 Fax: (709) 864-3018 https://www.mun.ca/faculty/sdufour/

From:	Engineering Consult <engrconsult@mun.ca></engrconsult@mun.ca>
Sent:	Wednesday, October 23, 2019 3:15 PM
То:	chemconsult@mun.ca
Cc:	Jayde Edmunds; Dennis Peters; Bruce Quinton
Subject:	Re: Proposed Calendar changes from Chemistry

Dear Dr. Warburton,

Thank you for the opportunity to comment on the sets of Calendar change documents for Computational Chemistry, Chemistry (Biological) and minor bookkeeping changes.

Unfortunately, your documents arrived too late for inclusion in the agenda package for today's meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science. Upon review, I find no impact on Engineering programs. I am 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

chemconsult@mun.ca

From:	Rohr, Linda <lerohr@mun.ca></lerohr@mun.ca>
Sent:	Friday, October 25, 2019 8:51 AM
То:	chemconsult@mun.ca
Subject:	Re: Proposed Calendar changes from Chemistry

Hello,

No concerns from HKR with the proposed changes to the Chemistry calendar entries.

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 PE 2027

From:	MIUG Consultations <miugconsultations@mi.mun.ca></miugconsultations@mi.mun.ca>
Sent:	Monday, November 4, 2019 1:54 PM
То:	chemconsult@mun.ca
Subject:	RE: Proposed Calendar changes from Chemistry

Hi,

Thank you for the opportunity to review and comment on these three proposals. These will have no impact on Marine Institute programs and we support the proposals.

Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

chemconsult@mun.ca

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r :

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Good Day

The Faculty of Medicine supports the proposed Calendar changes for Chemistry

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

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From:	Annie Mercier <amercier@mun.ca></amercier@mun.ca>
Sent:	Tuesday, November 12, 2019 10:06 AM
То:	Department of Chemistry Consult
Subject:	Re: FW: Proposed Calendar changes from Chemistry

Dear Peter:

Our undergraduate committee is supportive of the proposed calendar changes. It is nice to see more Ocean Sciences courses being included among the choices for the degrees in Chemistry (Biological). It was suggested that the new OCSC 4200 (Marine Omics) may also be suitable.

All the best,

Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php

chemconsult@mun.ca

From:	Davis,Erin <emdavis@mun.ca></emdavis@mun.ca>
Sent:	Tuesday, October 22, 2019 11:51 AM
То:	chemconsult@mun.ca
Subject:	Proposed Calendar changes from Chemistry
Attachments: 02	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf;
Chemistry_Calendarchan	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hi Peter,

Pharmacy has no concerns with the proposed changes, thank you for sending them for review.

Erin --Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca

From:	adeanugradswk <adeanugradswk@mun.ca></adeanugradswk@mun.ca>
Sent:	Wednesday, October 23, 2019 11:24 AM
То:	chemconsult@mun.ca
Subject:	RE: Proposed Calendar changes from Chemistry

Hello Peter,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

chemconsult@mun.ca

From:	Sharene Bungay <sharene@mun.ca></sharene@mun.ca>
Sent:	Thursday, November 14, 2019 8:34 AM
То:	chemconsult@mun.ca
Cc:	Hyde, Cathy
Subject:	Re: FW: Proposed Calendar changes from Chemistry

Hi Peter, The Computer Science Department supports the proposed changes and will add the Computational Chemistry major to the reserve list for the necessary courses. Regards, Sharene.

Sharene Bungay| Office: EN-2019Deputy Head (Undergraduate Studies) | Email: sharene@mun.caDepartment of Computer Science | Phone: (709) 864-6945Memorial University of Newfoundland | Web:www.cs.mun.ca/~sharene

Resource Implications

There are no resource implications associated with these changes.

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:

- \Box New course(s):
- \Box Amended or deleted course(s):
- □ New program(s):
- X 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 Programs

PROGRAM TITLE

General Degree in Chemistry (Biological) AND Honours Degree in Chemistry (Biological)

RATIONALE

- 1. The Chemistry (Biological) programs have proven very popular in the short time that they have existed, but based on feedback from the early students of the programs, some more flexibility in choice of biology/ocean sciences courses for the programs would make scheduling a timetable easier and allows for more choice in cases where certain Biology/Ocean Sciences courses may not be offered in a given calendar year. The two courses to be added as choices are Biology 4605 and Ocean Sciences 3600.
- 2. Additionally, the Chemistry (Biological) Honours program, due to its interdisciplinarity, currently has far more courses at the 2000 level and above used to evaluate Honours standing (currently clauses 1 to 5 of the Required Courses for 63 credit hours) than does the Honours program in Chemistry (39 credit hours). Here we seek to reduce the number of courses used to determine Honours standing in the Honours Chemistry (Biological) degree by only including the chemistry courses of the 2000 level or above in the evaluation (clauses 1,2 and 3 of Required Courses). Biochemistry, Biology and Ocean Sciences courses would not be used to determine Honours standing for this chemistry degree.
- 3. During the consultation stage, we had an issue with four of our current Chemistry (Biological) Honours students where, due to a timetable conflict with a required Chemistry course, the one Biology course they could take in the Winter semester that would fulfill their required Biology courses clause (and would allow them to graduate) was unavailable to them. Based on their suggestion (and interest), approval for a course substitution to their programs to allow them to take Biology 4200 Immunology to fulfill their required Biology course clause was granted.

Based on feedback from the Associate Dean and Faculty of Science Registrar following this course substitution for these students, we also include Biology 4200 in the list of choices for the required Biology courses clause. Biology was consulted again and have no concerns with the added choice.

CALENDAR CHANGES

11.3.8 General Degree in Chemistry (Biological)

Students wishing to pursue a General Degree in Chemistry (Biological) are encouraged to contact the Department Head or the Deputy Head (Undergraduate Studies) as early as possible and should consult those regulations of the Calendar dealing with <u>Degree Regulations</u> for the General Degree of Bachelor of Science.

11.3.8.1 Required Courses

- 1. Chemistry 1050 and 1051, 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3211, and 4410.
- 2. At least 6 credit hours from Chemistry 3210, 3303, 3411 or any 4000level Chemistry course.
- Biology 1001, 1002, 2250, 2060, and 3050 and at least 6 credit hours chosen from Biology 3530, 3950, 3951, 4010, 4050, <u>4200</u>, 4245, 4251, 4404, <u>4605</u>, and Ocean Sciences 3002 and 3600.
- 4. Biochemistry 2201 or the former 2101, 2901 and at least 6 credit hours from Biochemistry 3105, 3206 or 3106, 3207 or 3107, 4101, and 4201.
- 5. Mathematics 1000 and 1001. Statistics 2550 is strongly recommended.
- 6. Physics 1050 (or 1020) and Physics 1051 (or 1021).
- 7. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.

11.3.8.2 Other Information

In first year, prospective students for the General Degree in Chemistry (Biological) should complete:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- Chemistry 1050 and 1051, Biology 1001 and 1002, Physics 1050 (or 1020) and Physics 1051 (or 1021), and Mathematics 1000 and 1001.
- This program fulfills the first and second teachable requirements for admission into the <u>Bachelor of Education</u> (<u>Intermediate/Secondary</u>) at this University with Chemistry and Biology as the first and second teachable subjects, respectively.
- 4. Students in the Chemistry (Biological) program are not able to also qualify for a minor in Biology.
- 5. Some courses listed under **<u>Required Courses</u>** above require one or more prerequisites that are not defined as part of the program.

11.3.9 Honours Degree in Chemistry (Biological)

Students wishing to take Honours should consult those sections of the Calendar dealing with **Degree Regulations** for the Honours Degree of Bachelor of Science. Students wishing to pursue an Honours Degree in

Chemistry (Biological) are encouraged to contact the Department Head or the Deputy Head (Undergraduate Studies) as early as possible.

11.3.9.1 Required Courses

- 1. Chemistry 1050 and 1051, 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3211, 4410 and 490A/B.
- 2. At least 3 credit hours from Chemistry 3210, 3303, 3411 or any 4000level Chemistry course not used to fulfill clause 3. below.
- 3. At least 3 credit hours from Chemistry 4151, 4201, 4206, 4305, or 4701.
- Biology 1001, 1002, 2060, 2250, and 3050 and at least 6 credit hours chosen from Biology 3530, 3950, 3951, 4010, 4050, <u>4200</u>, 4245, 4251, 4404, <u>4605</u>, and Ocean Sciences 3002 and 3600.
- 5. Biochemistry 2201 or the former 2101, 2901 and at least 6 credit hours from Biochemistry 3105, 3206 or 3106, 3207 or 3107, 4101, and 4201.
- 6. Mathematics 1000 and 1001. Statistics 2550 is strongly recommended.
- 7. Physics 1050 (or 1020) and Physics 1051 (or 1021).
- 8. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.

11.3.9.2 Other Information

In first year, prospective students for the Honours Degree in Chemistry (Biological) should complete:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- Chemistry 1050 and 1051, Biology 1001 and 1002, Physics 1050 (or 1020) and Physics 1051 (or 1021), and Mathematics 1000 and 1001.
- 3.-Those courses in which a grade of B or an average of 75% or higher are required as specified under Academic Standing in the Degree Regulations for the Honours Degree of Bachelor of Science, are the courses beyond first year used to satisfy clauses 1.- 5 under Required Courses above.
- <u>3.</u> Chemistry 490A/B will normally require the equivalent of nine hours per week for two semesters. Registration in Chemistry 490A/B is restricted to those students who have honours standing. The Honours dissertation will be assessed by a committee comprising the supervisor and one other faculty member. Chemistry 490A/B Projects are to be approved by the Head of the Department or delegate.
- <u>4.</u> The Honours in Chemistry (Biological) program can be completed in four years. Students should consult the <u>Undergraduate Student</u> <u>Handbook</u> for timetabling details.

- 5. Students completing first year requirements for any of Chemistry, Mathematics, or Physics via the three course options (i.e. Chemistry 1010, 1050, 1051 (or 1010,the former 1011, and the former 1031), Mathematics 1090, 1000, 1001, Physics 1020, 1021, 1051) instead of the two course options (Chemistry 1050, 1051, Mathematics 1000, 1001, Physics 1050, 1051) will require the corresponding number of extra credits to obtain an Honours degree.
- <u>6.</u> With the permission of the Head of the Department, 6000-level courses may be taken in the final year of the Honours Program.
- <u>7.</u> This program fulfills the first and second teachable requirements for admission into the <u>Bachelor of Education</u> (<u>Intermediate/Secondary</u>) at this University with Chemistry and Biology as the first and second teachables, respectively.
- <u>8.</u> Students in the Chemistry (Biological) program are not able to also qualify for a minor in Biology.
- <u>9.</u> Some courses listed under <u>Required Courses</u> above require one or more prerequisites that are not defined as part of the program.

CALENDAR ENTRY AFTER CHANGES

11.3.8 General Degree in Chemistry (Biological)

Students wishing to pursue a General Degree in Chemistry (Biological) are encouraged to contact the Department Head or the Deputy Head (Undergraduate Studies) as early as possible and should consult those regulations of the Calendar dealing with <u>Degree Regulations</u> for the General Degree of Bachelor of Science.

11.3.8.1 Required Courses

- 1. Chemistry 1050 and 1051, 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3211, and 4410.
- 2. At least 6 credit hours from Chemistry 3210, 3303, 3411 or any 4000level Chemistry course.
- 3. Biology 1001, 1002, 2250, 2060, and 3050 and at least 6 credit hours chosen from Biology 3530, 3950, 3951, 4010, 4050, 4200, 4245, 4251, 4404, 4605, Ocean Sciences 3002 and 3600.
- 4. Biochemistry 2201 or the former 2101, 2901 and at least 6 credit hours from Biochemistry 3105, 3206 or 3106, 3207 or 3107, 4101, and 4201.
- 5. Mathematics 1000 and 1001. Statistics 2550 is strongly recommended.
- 6. Physics 1050 (or 1020) and Physics 1051 (or 1021).
- 7. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.

11.3.8.2 Other Information

In first year, prospective students for the General Degree in Chemistry (Biological) should complete:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- Chemistry 1050 and 1051, Biology 1001 and 1002, Physics 1050 (or 1020) and Physics 1051 (or 1021), and Mathematics 1000 and 1001.
- This program fulfills the first and second teachable requirements for admission into the <u>Bachelor of Education</u> (<u>Intermediate/Secondary</u>) at this University with Chemistry and Biology as the first and second teachable subjects, respectively.
- 4. Students in the Chemistry (Biological) program are not able to also qualify for a minor in Biology.
- 5. Some courses listed under **<u>Required Courses</u>** above require one or more prerequisites that are not defined as part of the program.

11.3.9 Honours Degree in Chemistry (Biological)

Students wishing to take Honours should consult those sections of the Calendar dealing with **Degree Regulations** for the Honours Degree of Bachelor of Science. Students wishing to pursue an Honours Degree in

Chemistry (Biological) are encouraged to contact the Department Head or the Deputy Head (Undergraduate Studies) as early as possible.

11.3.9.1 Required Courses

- 1. Chemistry 1050 and 1051, 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3211, 4410 and 490A/B.
- 2. At least 3 credit hours from Chemistry 3210, 3303, 3411 or any 4000level Chemistry course not used to fulfill clause 3. below.
- 3. At least 3 credit hours from Chemistry 4151, 4201, 4206, 4305, or 4701.
- Biology 1001, 1002, 2060, 2250, and 3050 and at least 6 credit hours chosen from Biology 3530, 3950, 3951, 4010, 4050, 4200, 4245, 4251, 4404, 4605,-Ocean Sciences 3002 and 3600.
- 5. Biochemistry 2201 or the former 2101, 2901 and at least 6 credit hours from Biochemistry 3105, 3206 or 3106, 3207 or 3107, 4101, and 4201.
- 6. Mathematics 1000 and 1001. Statistics 2550 is strongly recommended.
- 7. Physics 1050 (or 1020) and Physics 1051 (or 1021).
- 8. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.

11.3.9.2 Other Information

In first year, prospective students for the Honours Degree in Chemistry (Biological) should complete:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- Chemistry 1050 and 1051, Biology 1001 and 1002, Physics 1050 (or 1020) and Physics 1051 (or 1021), and Mathematics 1000 and 1001.
- 3. Chemistry 490A/B will normally require the equivalent of nine hours per week for two semesters. Registration in Chemistry 490A/B is restricted to those students who have honours standing. The Honours dissertation will be assessed by a committee comprising the supervisor and one other faculty member. Chemistry 490A/B Projects are to be approved by the Head of the Department or delegate.
- The Honours in Chemistry (Biological) program can be completed in four years. Students should consult the <u>Undergraduate Student</u> <u>Handbook</u> for timetabling details.
- Students completing first year requirements for any of Chemistry, Mathematics, or Physics via the three course options (i.e. Chemistry 1010, 1050, 1051 (or 1010,the former 1011, and the former 1031), Mathematics 1090, 1000, 1001, Physics 1020, 1021, 1051) instead of the two course options (Chemistry 1050, 1051, Mathematics 1000, 1001, Physics 1050, 1051)

will require the corresponding number of extra credits to obtain an Honours degree.

- 6. With the permission of the Head of the Department, 6000-level courses may be taken in the final year of the Honours Program.
- This program fulfills the first and second teachable requirements for admission into the <u>Bachelor of Education</u> (<u>Intermediate/Secondary</u>) at this University with Chemistry and Biology as the first and second teachables, respectively.
- 8. Students in the Chemistry (Biological) program are not able to also qualify for a minor in Biology.
- 9. Some courses listed under **<u>Required Courses</u>** above require one or more prerequisites that are not defined as part of the program.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From

Comments Received

Business	NO		
Education	NO		
Engineering	YES – no concerns		
Grenfell Campus, Science and the Environment			
Chemistry	YES – no concerns		
Human Kinetics and Recreation	YES – no concerns		
Humanities and Social Sciences	NO		
Marine Institute	YES – no concerns		
Medicine	YES – no concerns		
Music	NO		
Nursing	NO		
Pharmacy	YES – no concerns		
Science	YES – minor amendment		
Biochemistry	NO		
Biology	YES – no concerns		
Computer Science	YES – no concerns		
Earth Sciences	NO		
Economics	NO		
Geography	NO		
Mathematics	NO		
Ocean Sciences	YES – no concerns		
Physics	NO		
Psychology	NO		
Science	NO		
Social Work	YES – no concerns		

From:	chemconsult@mun.ca
Sent:	Tuesday, October 22, 2019 9:11 AM
То:	Business Administration; Education; Engineering and Applied Science; Grenfell Science
and the Environment; Hu	Iman Kinetics and Recreation; Humanities and Social Sciences; Library; Marine Institute; Medicine;
Music; Nursing; Pharma	cy; Science; Social Work
Cc:	'chemconsult@mun.ca'
Subject:	Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchar	nges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hello colleagues,

Please find attached three proposal documents for changes to the Chemistry calendar entries.

Document 1 outlines changes needed for the degree programs in Computational Chemistry. Document 2 outlines changed proposed for degree programs in Chemistry (Biological) Document 3 outlines minor bookkeeping changes (minor prerequisite changes, typo fixes and course recommendations added to programs).

Please forward any comments to <u>chemconsult@mun.ca</u>. Please also direct any questions to me at that address as well.

Thanks everyone for your time and efforts!

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry				
Memorial University of Newfoundla	nd			
St. John's, Newfoundland and Labrad	or A1B 3X7			
Chemistry-Physics	Room C 2020	T 709 864 6939		F 709 864 3702

Peter Warburton

From:	Peter Warburton <peterw@mun.ca></peterw@mun.ca>
Sent:	Wednesday, October 23, 2019 10:47 AM
То:	Power, Barry P
Subject:	Re: Proposed Calendar changes from Chemistry

Yeah we can remove "only". My biggest reason for the change is that if we allow non-Honours students to be signed in it would be best if the prerequisite formally say that. So we can remove the UL as well...

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

On Oct 23, 2019, at 10:40 AM, Power, Barry P <b.power@mun.ca> wrote:

Hi Peter,

I had a read through 490A/B the description again, and I understand the point about the first line in the description, "is available only to students in Chemistry Honours or Chemistry Joint Honours Programs". I think we could just remove the word "only" and be done with it.

Perhaps the UL could come out altogether as well? Saying that non-honours students can be signed in I don't think would constitute a "usage limitation," do you? I think it's more appropriate to state that in the pre-requisites instead, as we are proposing to do.

We'll figure out the bureaucracy of the calendar eventually...

```
Barry
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BARRY POWER, PhD | MANAGER OF ACADEMIC PROGRAMS / PER COURSE INSTRUCTOR

Departments of Chemistry and Earth SciencesMemorial University of NewfoundlandSt. John's, Newfoundland and Labrador| A1B 3X7Chemistry-Physics| Room C 2053 | T 709 864 8083 | F 709 864 3702Earth Sciences| Room ER 4063C | T 709 864 4464 | F 709 864 2589

From: Peter Warburton <peterw@mun.ca> Sent: Wednesday, October 23, 2019 10:19 AM To: Associate Dean of Science (Undergraduate) <adsu@mun.ca> Cc: Power, Barry P <b.power@mun.ca> Subject: Re: Proposed Calendar changes from Chemistry

My intention was to "formally" allow permission as a prerequisite for non-Honours students to be signed in. I must have missed the first part of the PR when I put the document together.

We can amend the language at meeting to clear that up, I assume?

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

On Oct 23, 2019, at 10:10 AM, Associate Dean of Science (Undergraduate) adsu@mun.ca wrote:

Hi Peter,

That wasn't my intent! If you would prefer the statement in the PR rather than UL then that is fine, but it really doesn't change it. It might be worthwhile thinking of changing the first sentence in the description to lighten it a bit, say remove the word "only".

Т

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL ,|Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

From: Peter Warburton <<u>peterw@mun.ca</u>> Sent: Wednesday, October 23, 2019 10:07 AM To: Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> Cc: Power, Barry P <<u>b.power@mun.ca</u>> Subject: Re: Proposed Calendar changes from Chemistry

Fair enough. We can remove that change...

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

2
Hi Peter and Barry,

This is about the change to CHEM 490.

The new statement makes the UL statement redundant. Also, it is inconsistent with the first sentence in the course description;

"is available only to students in Chemistry Honours or Chemistry Joint Honours Programs."

Furthermore, the new statement does nothing to aid students getting into the program easier as with that statement in the PR or the UL, students still need to be signed in.

4

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

Peter Warburton

From:	Associate Dean of Science (Undergraduate) <adsu@mun.ca></adsu@mun.ca>
Sent:	Wednesday, October 23, 2019 9:09 PM
То:	Peter Warburton
Subject:	RE: Proposed Calendar changes from Chemistry

I know, I plagiarized your request as you might have guessed from the copy and paste wording...the special appeals committee of FoSCUgS also suggested it. What I would do is take my comment, get approval from Sunil if he approves, and have see if the chemistry CUgS also agrees and just amend the proposal so it all goes to FoSCUgS at the November meeting and then Faculty Council.

Т

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

From: Peter Warburton <peterw@mun.ca> Sent: Wednesday, October 23, 2019 5:13 PM To: Associate Dean of Science (Undergraduate) <adsu@mun.ca> Cc: Power, Barry P <b.power@mun.ca> Subject: Re: Proposed Calendar changes from Chemistry

Funny, We just did that as a course substitution for a student!

The changes I put forward were what we had on file. Can certainly amend that one in at the meeting as well.

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T <u>709 864 6939</u> |<u>F 709 864 3702</u>

On Oct 23, 2019, at 3:40 PM, Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> wrote:

Hi Peter and Barry,

This email is about the Chemistry (Biological) program.

Has the department considered adding Biology 4200 (Immunology) to the list of biology courses in 11.3.8.1.3 and 11.3.9.1.4? The course description of Immunology includes "(t)he molecular and cellular basis of allergy, autoimmunity, vaccination and cancer immunology will also be discussed" and so it would fit well within the program.

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

Peter Warburton

From:	Rayner-Canham, Geoff <grcanham@grenfell.mun.ca></grcanham@grenfell.mun.ca>
Sent:	Friday, November 8, 2019 12:23 PM
То:	Peter Warburton
Subject:	Fw: Proposed Calendar changes from Chemistry

Hi again, Peter,

Robert is the Chair of the calendar change committee (or whatever it is called) and here is his suggestion which seems eminently sensible, for you to request the same change for the Grenfell section.

Geoff

From: Bailey, Robert F. <rbailey@grenfell.mun.ca> Sent: November 8, 2019 12:09 PM To: Rayner-Canham, Geoff <grcanham@grenfell.mun.ca> Cc: Warkentin, lan <ian.warkentin@grenfell.mun.ca> Subject: RE: Proposed Calendar changes from Chemistry

Hi Geoff (and lan),

As I mentioned previously, for the changes to CHEM 2210, 2301, 2302 and 2400, it's probably best to request a secondary change for those Calendar entries in the Grenfell section, in order that the two campuses' entries remain consistent. Any other changes (e.g. to 2440, or first-year courses) can be made in a separate proposal and considered later.

Thanks, Robert.

EXAMPLE 2 Constraints of Newfoundland Corner Brook, NL A2H 6P9, Canada

Office: AS 3022 Phone: +1 (709) 637-6293 Web: <u>http://www2.grenfell.mun.ca/rbailey/</u>

Peter Warburton

From:	Peter Warburton <peterw@mun.ca></peterw@mun.ca>
Sent:	Friday, November 8, 2019 11:46 AM
То:	'Rayner-Canham, Geoff'
Subject:	RE: MUN-StJ Calendar amendments

Hi Geoff,

Thanks for the update on that. Once I have the "official" notification I will include that in the documents to go to FoSCUgS for approval.

And sounds very good on an informal look at any changes you have coming down the pipe. Resolving issues (hopefully unlikely) beforehand certainly makes sense.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry			
Memorial University of Newfor	undland		
St. John's, Newfoundland and L	abrador A1B 3X7		
Chemistry-Physics	Room C 2020	T 709 864 6939	F 709 864 3702

From: Rayner-Canham, Geoff <grcanham@grenfell.mun.ca> Sent: Friday, November 8, 2019 11:29 AM To: Peter Warburton <peterw@mun.ca> Subject: MUN-StJ Calendar amendments

Good day, Peter,

Just an informal message to let you know that the Grenfell Chemistry Group have met and we thank you for the amendment to the Chem 1001 requirement. All is good with the document from our perspective. You will have 'official' notification in due course.

We'll revise the Grenfell entries in about the next ten days (sooner if possible). I'll send them to you informally when they're ready just so that when they come through the 'official' channels any problems on your side have already been resolved.

Best wishes, Geoff

chemconsult@mun.ca

From:	Suzanne Dufour <sdufour@mun.ca></sdufour@mun.ca>
Sent:	Thursday, October 31, 2019 10:39 AM
То:	Department of Chemistry Consult; jody-Lynn Burke
Subject:	Fwd: FW: Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf;
02	
_Chemistry_Calendarchang	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hi Peter,

The Biology Undergraduate Studies Committee has reviewed the proposed changes to Chemistry calendar entries. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Tel: (709) 864-8025 Fax: (709) 864-3018 https://www.mun.ca/faculty/sdufour/

Peter Warburton

From:	Suzanne Dufour <sdufour@mun.ca></sdufour@mun.ca>
Sent:	Thursday, November 14, 2019 1:10 PM
То:	Peter Warburton
Subject:	Re: FW: Proposed Calendar changes from Chemistry

Hi Peter,

Thanks for your email and for reaching out regarding your Chemistry (Biological) Honours program. I don't see any problems with including Biol 4200 in the list of choices for those students as an option to fulfull the required Biology courses. I have asked our Academic Program Officer if she could foresee any issues, and she can't see any.

Out of curiosity - could you tel me which of our Biology courses caused a scheduling conflict for your students?

Best wishes,

Suzanne

On 2019-11-14 9:03 AM, Peter Warburton wrote:

Hi Suzanne,

Thanks for your recent feedback on the Chemistry calendar changes.

In the period since those proposals went out, we had an issue with four of our Chemistry (Biological) Honours students where, due to a timetable conflict with a required Chemistry course, the one Biology course they could take in the Winter semester that would fulfill their required Biology courses clause (and would allow them to graduate) was unavailable to them. Based on their suggestion (and interest) I approved a course substitution to their programs to allow them to take Biology 4200 Immunology to fulfill their required Biology course clauses.

Our proposed Chemistry (Biological) programs calendar changes had added Biology 4605 and Ocean Sciences 3600 as courses that could be used to fulfill the Biology courses requirements. Based on feedback from the Associate Dean and Faculty of Science Registrar following these course substitutions, they have suggested we amend our Chem Biological proposal for Tuesday's FoSCUgS meeting to include Biology 4200 in the list of choices towards that clause. My departmental head and undergrad committee are ok with this addition.

However, I wanted to run this by you and your colleagues to see if there would be any objections or concerns with it. Unfortunately it was expected the FoSCUgS meeting to discuss our changes would be in early December, but now the last possible meeting for calendar changes is instead next Tuesday. I'm sorry this doesn't allow for much time for consultation turnaround.

In the proposal document I will send to FoSCUgs today (the deadline for receiving them) I will include Biology 4200 in our changes. If there are any objections or concerns from your end, we can remove the 4200 via an amendment in meeting, but I am certainly hoping there are no concerns with that addition of choice.

Thanks for your time and efforts!

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

chemconsult@mun.ca

From:	Engineering Consult <engrconsult@mun.ca></engrconsult@mun.ca>
Sent:	Wednesday, October 23, 2019 3:15 PM
То:	chemconsult@mun.ca
Cc:	Jayde Edmunds; Dennis Peters; Bruce Quinton
Subject:	Re: Proposed Calendar changes from Chemistry

Dear Dr. Warburton,

Thank you for the opportunity to comment on the sets of Calendar change documents for Computational Chemistry, Chemistry (Biological) and minor bookkeeping changes.

Unfortunately, your documents arrived too late for inclusion in the agenda package for today's meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science. Upon review, I find no impact on Engineering programs. I am 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

chemconsult@mun.ca

From:	Rohr, Linda <lerohr@mun.ca></lerohr@mun.ca>
Sent:	Friday, October 25, 2019 8:51 AM
То:	chemconsult@mun.ca
Subject:	Re: Proposed Calendar changes from Chemistry

Hello,

No concerns from HKR with the proposed changes to the Chemistry calendar entries.

Linda

Linda E. Rohr PhD

Dean, School of Human Kinetics & Recreation Memorial University t: 709.864.8129 f: 709.864.7531 e: <u>lerohr@mun.ca</u> PE 2027

chemconsult@mun.ca

MIUG Consultations <miugconsultations@mi.mun.ca></miugconsultations@mi.mun.ca>
Monday, November 4, 2019 1:54 PM
chemconsult@mun.ca
RE: Proposed Calendar changes from Chemistry

Hi,

Thank you for the opportunity to review and comment on these three proposals. These will have no impact on Marine Institute programs and we support the proposals.

Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535

chemconsult@mun.ca

From:	cvardy@mun.ca
Sent:	Friday, November 8, 2019 3:08 PM
То:	chemconsult@mun.ca
Cc:	Margaret.Steele@med.mun.ca
Subject:	FW: Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchan	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Good Day

The Faculty of Medicine supports the proposed Calendar changes for Chemistry

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

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chemconsult@mun.ca

From:	Annie Mercier <amercier@mun.ca></amercier@mun.ca>
Sent:	Tuesday, November 12, 2019 10:06 AM
То:	Department of Chemistry Consult
Subject:	Re: FW: Proposed Calendar changes from Chemistry

Dear Peter:

Our undergraduate committee is supportive of the proposed calendar changes. It is nice to see more Ocean Sciences courses being included among the choices for the degrees in Chemistry (Biological). It was suggested that the new OCSC 4200 (Marine Omics) may also be suitable.

All the best,

Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php

chemconsult@mun.ca

From:	Davis,Erin <emdavis@mun.ca></emdavis@mun.ca>
Sent:	Tuesday, October 22, 2019 11:51 AM
То:	chemconsult@mun.ca
Subject:	Proposed Calendar changes from Chemistry
Attachments:	
	01_Chemistry_Calendarchanges_ComputationalChemistryProgra
ms.pdf; 02	
_Chemistry_Calendarcha	nges_ChemistryBiologicalPrograms.pdf; 03
_Chemistry_Calendarcha	nges_ChemistryCalendarBookkeeping.pdf

Hi Peter,

Pharmacy has no concerns with the proposed changes, thank you for sending them for review.

Erin --Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca

chemconsult@mun.ca

From:	adeanugradswk <adeanugradswk@mun.ca></adeanugradswk@mun.ca>
Sent:	Wednesday, October 23, 2019 11:24 AM
То:	chemconsult@mun.ca
Subject:	RE: Proposed Calendar changes from Chemistry

Hello Peter,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

chemconsult@mun.ca

Sharene Bungay <sharene@mun.ca></sharene@mun.ca>	
Thursday, November 14, 2019 8:34 AM	
chemconsult@mun.ca	
Hyde, Cathy	
Re: FW: Proposed Calendar changes from Chemistry	

Hi Peter,

The Computer Science Department supports the proposed changes and will add the Computational Chemistry major to the reserve list for the necessary courses. Regards, Sharene.

Sharene Bungay| Office: EN-2019Deputy Head (Undergraduate Studies) | Email: sharene@mun.caDepartment of Computer Science | Phone: (709) 864-6945Memorial University of Newfoundland | Web:www.cs.mun.ca/~sharene

Resource Implications

There are no resource implications associated with these changes.

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:

- \Box New course(s):
- X Amended or deleted course(s):
- □ New program(s):
- X 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: _____

This document proposes several changes to the Chemistry degree programs and courses but are generally bookkeeping in nature (additional course recommendations, fixing of typos, minor changes to course prerequisites). Therefore, they are being presented as a package

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Senate Summary Page for Programs

PROGRAM TITLE

General Degree – Major in Chemistry AND Honours Degree in Chemistry

RATIONALE

- 1. Mathematics 2260 is now a recommended course for the programs.
- 2. Registration in Chemistry 490A/B is currently limited to students with honours standing. We clarify that registration in these courses is normally limited to those with honours standing, but others can take them with appropriate permission.

CALENDAR CHANGES 11.3.4 General Degree - Major in Chemistry

Students wishing to take a Major in Chemistry should consult those regulations of the Calendar dealing with **Degree Regulations** for the General Degree of Bachelor of Science. The courses required for a Major in Chemistry are:

- 1. Chemistry 1050 and 1051 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3210, 3211, 3303, and 3411.
- 2. Physics 1050 (or 1020) and 1051 (or 1021).
- 3. Mathematics 1000, 1001, 2000, and 2050.
- 4. Biochemistry 2201 or the former 2101, and 2901.

Recommended courses: Mathematics 2051 <u>and Mathematics 2260</u>, Physics 2820 and/or 2750.

Students considering declaring Chemistry as their Major are encouraged to contact either the Head of the Department or the Deputy Head (Undergraduate Studies).

Chemistry Majors may complete a minor in <u>Applied Science - Process</u> <u>Engineering</u>. The requirements for this minor are detailed under <u>Faculty of</u> <u>Engineering and Applied Science, Minor in Applied Science - Process</u> <u>Engineering</u>.

11.3.5 Honours Degree in Chemistry

Students wishing to take Honours should consult those regulations of the Calendar dealing with **Degree Regulations** for the Honours Degree of Bachelor of Science.

11.3.5.1 Required Courses

- CHEM 1050 and 1051 or (1010, the former 1011 and the former 1031 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3210, 3211, 3303, 3411, and 490A/B.
- 2. 12 credit hours selected from the 4000 level Chemistry courses chosen in consultation with the 490A/B supervisor for chemistry.
- 3. Physics 1050 (or 1020) and 1051 (or 1021).
- 4. Mathematics 1000, 1001, 2000, and 2050.
- 5. Biochemistry 2201 or the former 2101, and 2901.

Chemistry Honours students may complete a minor in <u>Applied Science -</u> <u>Process Engineering</u>. The requirements for this minor are detailed under <u>Faculty of Engineering and Applied Science, Minor in Applied</u> <u>Science - Process Engineering</u>.

11.3.5.2 Other Information

- Those courses in which a grade of B or an average of 75% or higher are required, as specified under <u>Academic Standing</u> in the <u>Degree</u> <u>Regulations</u> for the Honours Degree of Bachelor of Science, are the courses beyond first year used to satisfy clause 1. under <u>Required</u> <u>Courses</u> above.
- 2. Recommended courses: Mathematics 2051 <u>and Mathematics 2260</u>, Physics 2820 and/or 2750.
- 3. A thesis based on a selected research topic carried out under the supervision of a member of the Department is to be submitted in the final year.
- 4. Chemistry 490A/B will normally require the equivalent of nine hours per week for two semesters. Registration in Chemistry 490A/B is <u>normally</u> restricted to those students who have honours standing. The Honours dissertation will be assessed by a committee comprising the supervisor and one other faculty member.
- 5. With approval of the Heads of the Chemistry and Biochemistry Departments prior to registration, a number of courses in Biochemistry may be substituted for a like number of Chemistry courses.
- 6. Prospective Honours students in Chemistry in their first year should take
 - a. Six credit hours in <u>Critical Reading and Writing</u> (CRW) courses, including at least 3 credit hours in English courses.
 - b. Chemistry 1050 and 1051 (or 1200 and 1001).
 - c. Physics 1050 and 1051 or 1020 and 1021.
 - d. Mathematics 1000 and 1001.
 - e. Six credit hours in other courses.
- 7. Students should consult the <u>Undergraduate Student Handbook</u> for timetabling details.

 Students completing first year requirements for either Chemistry or Mathematics via the three course options (i.e. Chemistry 1010, 1050, 1051, Mathematics 1000, 1001 (or 1001/B, 1000, 1001) instead of the

Mathematics 1090, 1000, 1001 (or 109A/B, 1000, 1001) instead of the two course options (Chemistry 1050, 1051, Mathematics 1000, 1001) will require the corresponding number of extra credits to obtain an Honours degree.

- 9. Arrangements for subsequent years will depend on the other science subjects being studied and should be made in consultation with the Faculty Advisor.
- 10. Certain advanced courses may only be offered in alternate years. Candidates therefore should consult the Head of the Department before registration.
- 11. Certain Graduate courses may be taken in the final year of the Honours Program with the permission of the Head of the Department.
- 12. Details of Joint Honours programs with Biochemistry, Earth Sciences, Mathematics and Physics are outlined under **Joint Programs**.
- 13. Details of the Environmental Science (Chemistry Stream) Major or Honours are outlined under the <u>Grenfell Campus</u> section of the Calendar.

CALENDAR ENTRY AFTER CHANGES

11.3.4 General Degree - Major in Chemistry

Students wishing to take a Major in Chemistry should consult those regulations of the Calendar dealing with **Degree Regulations** for the General Degree of Bachelor of Science. The courses required for a Major in Chemistry are:

- 1. Chemistry 1050 and 1051 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3210, 3211, 3303, and 3411.
- 2. Physics 1050 (or 1020) and 1051 (or 1021).
- 3. Mathematics 1000, 1001, 2000, and 2050.
- 4. Biochemistry 2201 or the former 2101, and 2901.

Recommended courses: Mathematics 2051 and Mathematics 2260, Physics 2820 and/or 2750.

Students considering declaring Chemistry as their Major are encouraged to contact either the Head of the Department or the Deputy Head (Undergraduate Studies).

Chemistry Majors may complete a minor in **Applied Science - Process Engineering**. The requirements for this minor are detailed under **Faculty of Engineering and Applied Science, Minor in Applied Science - Process Engineering**.

11.3.5 Honours Degree in Chemistry

Students wishing to take Honours should consult those regulations of the Calendar dealing with **Degree Regulations** for the Honours Degree of Bachelor of Science.

11.3.5.1 Required Courses

- 1. CHEM 1050 and 1051 or (1010, the former 1011 and the former 1031 (or 1200 and 1001), 2100, 2210, 2301, 2302, 2400, 2401, 3110, 3210, 3211, 3303, 3411, and 490A/B.
- 2. 12 credit hours selected from the 4000 level Chemistry courses chosen in consultation with the 490A/B supervisor for chemistry.
- 3. Physics 1050 (or 1020) and 1051 (or 1021).
- 4. Mathematics 1000, 1001, 2000, and 2050.
- 5. Biochemistry 2201 or the former 2101, and 2901.

Chemistry Honours students may complete a minor in <u>Applied Science -</u> <u>Process Engineering</u>. The requirements for this minor are detailed under <u>Faculty of Engineering and Applied Science, Minor in Applied</u> <u>Science - Process Engineering</u>.

11.3.5.2 Other Information

- Those courses in which a grade of B or an average of 75% or higher are required, as specified under <u>Academic Standing</u> in the <u>Degree</u> <u>Regulations</u> for the Honours Degree of Bachelor of Science, are the courses beyond first year used to satisfy clause 1. under <u>Required</u> <u>Courses</u> above.
- 2. Recommended courses: Mathematics 2051 and Mathematics 2260, Physics 2820 and/or 2750.
- 3. A thesis based on a selected research topic carried out under the supervision of a member of the Department is to be submitted in the final year.
- 4. Chemistry 490A/B will normally require the equivalent of nine hours per week for two semesters. Registration in Chemistry 490A/B is normally restricted to those students who have honours standing. The Honours dissertation will be assessed by a committee comprising the supervisor and one other faculty member.
- 5. With approval of the Heads of the Chemistry and Biochemistry Departments prior to registration, a number of courses in Biochemistry may be substituted for a like number of Chemistry courses.
- 6. Prospective Honours students in Chemistry in their first year should take
 - a. Six credit hours in <u>Critical Reading and Writing</u> (CRW) courses, including at least 3 credit hours in English courses.
 - b. Chemistry 1050 and 1051 (or 1200 and 1001).
 - c. Physics 1050 and 1051 or 1020 and 1021.

- d. Mathematics 1000 and 1001.
- e. Six credit hours in other courses.
- 7. Students should consult the <u>Undergraduate Student Handbook</u> for timetabling details.
- Students completing first year requirements for either Chemistry or Mathematics via the three course options (i.e. Chemistry 1010, 1050, 1051,

Mathematics 1090, 1000, 1001 (or 109A/B, 1000, 1001) instead of the two course options (Chemistry 1050, 1051, Mathematics 1000, 1001) will require the corresponding number of extra credits to obtain an Honours degree.

- 9. Arrangements for subsequent years will depend on the other science subjects being studied and should be made in consultation with the Faculty Advisor.
- 10. Certain advanced courses may only be offered in alternate years. Candidates therefore should consult the Head of the Department before registration.
- 11. Certain Graduate courses may be taken in the final year of the Honours Program with the permission of the Head of the Department.
- 12. Details of Joint Honours programs with Biochemistry, Earth Sciences, Mathematics and Physics are outlined under <u>Joint Programs</u>.
- 13. Details of the Environmental Science (Chemistry Stream) Major or Honours are outlined under the **<u>Grenfell Campus</u>** section of the Calendar.

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

COURSE NUMBER AND TITLE

Chemistry 2100 (Analytical Chemistry I) Chemistry 2210 (Introductory Inorganic Chemistry) Chemistry 2301 (Thermodynamics and Kinetics) Chemistry 2302 (Quantum Chemistry and Spectroscopy) Chemistry 2400 (Introductory Organic Chemistry I)

RATIONALE

These courses have as one of the prerequisites a minimum 60% in Chemistry 1051, OR a minimum of 65% in either Chemistry 1001 (offered at Grenfell Campus) or the former Chemistry 1031. For consistency of treatment of first year chemistry course offerings by Memorial University, we propose to change the minimum required mark for entry into these courses for Chemistry 1001/1031 to 60%. Wording is also made consistent across all the course descriptions.

Upon consultation with Grenfell Campus (Science and the Environment) it was noted that these courses are offered at Grenfell and therefore the same changes could be made to the Grenfell section of the Calendar. They have suggested the changes to the Grenfell section of the calendar would be most sensibly made as secondary changes within this proposal.

CALENDAR CHANGES 2100 Analytical Chemistry I

is an introduction to analytical chemistry and includes preparation of samples and standards, calibration methods, statistical treatment of data, spectrophotometric trace analysis, gravimetric analysis and volumetric analysis including acid-base titrations, precipitation titrations, oxidationreduction titrations, complexometric titrations and titrations in non-aqueous systems. Also introduced are liquid-liquid and other types of extraction, and chromatography with key methods of detection. Theoretical, practical and problem-solving aspects are covered.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 3100

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum $\underline{60\%}$ $\underline{65\%}$ in either 1001 or the former 1031

2210 Introductory Inorganic Chemistry

focuses on fundamental concepts in the chemistry of s, p, and d block elements and their compounds. Emphasis will be placed on periodic trends in physical and chemical properties, molecular symmetry, molecular orbital diagrams, simple crystal structures, Lewis acid/base theory, and introductory coordination chemistry.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% 65% in CHEM 1001 or the former 1031

2301 Thermodynamics and Kinetics

builds upon knowledge of physical chemistry from first year. It covers the three laws of thermodynamics for ideal and real systems as well as chemical kinetics. Topics in thermodynamics include the thermodynamics of ideal and real gases, phases, and solutions, the Maxwell relations, equilibria between phases, and in electrolyte solutions. The integrated rate laws for simple and complex mechanisms, and the temperature dependence of reaction rates in terms of kinetic molecular theory are some of the topics discussed in the kinetics section of the course.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 2300

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051, or a minimum 60% 65% in either CHEM 1001 or the former CHEM 1031; Mathematics 1001. Physics 1051 or Physics 1021 is recommended.

2302 Quantum Chemistry and Spectroscopy

examines the quantum mechanics of simple systems such as the particle in a box, the harmonic oscillator, linear rotor, and hydrogen-like atoms. Topics also include orbital quantum numbers, spin, many electron atoms, an introduction to quantum mechanical methods, the electronic structures of molecules, bonding, and symmetry. Furthermore, electronic, rotational, and vibrational spectroscopy will be discussed as well as modern applications of spectroscopy and lasers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CO: Mathematics 2000 is recommended

CR: the former CHEM 3301

LH: 3

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or a minimum 60% 65% in either CHEM 1001 or the former CHEM 1031; Mathematics 1001 and Physics 1051 or Physics 1021

2400 Introductory Organic Chemistry I

is a course on bonding involving carbon; conformations and stereochemistry; introduction to functional groups and nomenclature; properties, syntheses and reactions of hydrocarbons, alkyl halides, alcohols and ethers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: CHEM 2440

LH: 3

OR: 2 hours of tutorial weekly

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or CHEM 1010 and the former CHEM 1011 with a grade of at least 80% in each; or the former CHEM 1011 with a grade of at least 85%; <u>or a minimum of 60% in CHEM 1001 or the former CHEM 1031</u> or CHEM 1001 (or the former CHEM 1031) with a grade of at least 65%

CALENDAR ENTRY AFTER CHANGES 2100 Analytical Chemistry I

is an introduction to analytical chemistry and includes preparation of samples and standards, calibration methods, statistical treatment of data, spectrophotometric trace analysis, gravimetric analysis and volumetric analysis including acid-base titrations, precipitation titrations, oxidationreduction titrations, complexometric titrations and titrations in non-aqueous systems. Also introduced are liquid-liquid and other types of extraction, and chromatography with key methods of detection. Theoretical, practical and problem-solving aspects are covered.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 3100

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% in either 1001 or the former 1031

2210 Introductory Inorganic Chemistry

focuses on fundamental concepts in the chemistry of s, p, and d block elements and their compounds. Emphasis will be placed on periodic trends in physical and chemical properties, molecular symmetry, molecular orbital diagrams, simple crystal structures, Lewis acid/base theory, and introductory coordination chemistry. AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% in CHEM 1001 or the former 1031

2301 Thermodynamics and Kinetics

builds upon knowledge of physical chemistry from first year. It covers the three laws of thermodynamics for ideal and real systems as well as chemical kinetics. Topics in thermodynamics include the thermodynamics of ideal and real gases, phases, and solutions, the Maxwell relations, equilibria between phases, and in electrolyte solutions. The integrated rate laws for simple and complex mechanisms, and the temperature dependence of reaction rates in terms of kinetic molecular theory are some of the topics discussed in the kinetics section of the course.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 2300

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051, or a minimum 60% in either CHEM 1001 or the former CHEM 1031;

Mathematics 1001. Physics 1051 or Physics 1021 is recommended.

2302 Quantum Chemistry and Spectroscopy

examines the quantum mechanics of simple systems such as the particle in a box, the harmonic oscillator, linear rotor, and hydrogen-like atoms. Topics also include orbital quantum numbers, spin, many electron atoms, an introduction to quantum mechanical methods, the electronic structures of molecules, bonding, and symmetry. Furthermore, electronic, rotational, and vibrational spectroscopy will be discussed as well as modern applications of spectroscopy and lasers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CO: Mathematics 2000 is recommended

CR: the former CHEM 3301

LH: 3

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or a minimum 60% in either CHEM 1001 or the former CHEM 1031; Mathematics 1001 and Physics 1051 or Physics 1021

2400 Introductory Organic Chemistry I

is a course on bonding involving carbon; conformations and stereochemistry; introduction to functional groups and nomenclature;

properties, syntheses and reactions of hydrocarbons, alkyl halides, alcohols and ethers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: CHEM 2440

LH: 3

OR: 2 hours of tutorial weekly

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or CHEM 1010 and the former CHEM 1011 with a grade of at least 80% in each; or the former CHEM 1011 with a grade of at least 85%; or a minimum of 60% in CHEM 1001 or the former CHEM 1031

SECONDARY CALENDAR CHANGES (Grenfell Campus section of Calendar – Chemistry Course Descriptions)

2100 Analytical Chemistry I

is an introduction to analytical chemistry and includes preparation of samples and standards, calibration methods, statistical treatment of data, spectrophotometric trace analysis, gravimetric analysis and volumetric analysis including acid-base titrations, precipitation titrations, oxidationreduction titrations, complexometric titrations and titrations in non-aqueous systems. Also introduced are liquid-liquid and other types of extraction, and chromatography with key methods of detection. Theoretical, practical and problem-solving aspects are covered.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 3100

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% 65% in either 1001 or the former 1031

2210 Introductory Inorganic Chemistry

focuses on fundamental concepts in the chemistry of s, p, and d block elements and their compounds. Emphasis will be placed on periodic trends in physical and chemical properties, molecular symmetry, molecular orbital diagrams, simple crystal structures, Lewis acid/base theory, and introductory coordination chemistry.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% 65% in CHEM 1001 or the former 1031

2301 Thermodynamics and Kinetics

builds upon knowledge of physical chemistry from first year. It covers the three laws of thermodynamics for ideal and real systems as well as chemical kinetics. Topics in thermodynamics include the thermodynamics of ideal and real gases, phases, and solutions, the Maxwell relations, equilibria between phases, and in electrolyte solutions. The integrated rate laws for simple and complex mechanisms, and the temperature dependence of reaction rates in terms of kinetic molecular theory are some of the topics discussed in the kinetics section of the course.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 2300

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051, or a minimum 60% 65% in either CHEM 1001 or the former CHEM 1031; Mathematics 1001. Physics 1051 or Physics 1021 is recommended.

2302 Quantum Chemistry and Spectroscopy

examines the quantum mechanics of simple systems such as the particle in a box, the harmonic oscillator, linear rotor, and hydrogen-like atoms. Topics also include orbital quantum numbers, spin, many electron atoms, an introduction to quantum mechanical methods, the electronic structures of molecules, bonding, and symmetry. Furthermore, electronic, rotational, and vibrational spectroscopy will be discussed as well as modern applications of spectroscopy and lasers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CO: Mathematics 2000 is recommended

CR: the former CHEM 3301

LH: 3

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or a minimum 60% 65% in either CHEM 1001 or the former CHEM 1031; Mathematics 1001 and Physics 1051 or Physics 1021

2400 Introductory Organic Chemistry I

is a course on bonding involving carbon; conformations and stereochemistry; introduction to functional groups and nomenclature; properties, syntheses and reactions of hydrocarbons, alkyl halides, alcohols and ethers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: CHEM 2440

LH: 3

OR: 2 hours of tutorial weekly

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or CHEM 1010 and the former CHEM 1011 with a grade of at least 80% in each; or the former CHEM 1011 with a grade of at least 85%; or a minimum of 60% in CHEM 1001 or the former CHEM 1031 or CHEM 1001 (or the former CHEM 1031) with a grade of at least 65%

SECONDARY CALENDAR ENTRY AFTER CHANGES (Grenfell Campus section of Calendar – Chemistry Course Descriptions)

2100 Analytical Chemistry I

is an introduction to analytical chemistry and includes preparation of samples and standards, calibration methods, statistical treatment of data, spectrophotometric trace analysis, gravimetric analysis and volumetric analysis including acid-base titrations, precipitation titrations, oxidationreduction titrations, complexometric titrations and titrations in non-aqueous systems. Also introduced are liquid-liquid and other types of extraction, and chromatography with key methods of detection. Theoretical, practical and problem-solving aspects are covered.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 3100

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% in either 1001 or the former 1031

2210 Introductory Inorganic Chemistry

focuses on fundamental concepts in the chemistry of s, p, and d block elements and their compounds. Emphasis will be placed on periodic trends in physical and chemical properties, molecular symmetry, molecular orbital diagrams, simple crystal structures, Lewis acid/base theory, and introductory coordination chemistry.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051 or a minimum 60% in CHEM 1001 or the former 1031

2301 Thermodynamics and Kinetics

builds upon knowledge of physical chemistry from first year. It covers the three laws of thermodynamics for ideal and real systems as well as chemical kinetics. Topics in thermodynamics include the thermodynamics of ideal and real gases, phases, and solutions, the Maxwell relations, equilibria between phases, and in electrolyte solutions. The integrated rate laws for simple and complex mechanisms, and the temperature dependence of reaction rates in terms of kinetic molecular theory are some of the topics discussed in the kinetics section of the course.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 2300

LH: 3

PR: Science 1807 and Science 1808; minimum 60% in CHEM 1051, or a minimum 60% in either CHEM 1001 or the former CHEM 1031;

Mathematics 1001. Physics 1051 or Physics 1021 is recommended.

2302 Quantum Chemistry and Spectroscopy

examines the quantum mechanics of simple systems such as the particle in a box, the harmonic oscillator, linear rotor, and hydrogen-like atoms. Topics also include orbital quantum numbers, spin, many electron atoms, an introduction to quantum mechanical methods, the electronic structures of molecules, bonding, and symmetry. Furthermore, electronic, rotational, and vibrational spectroscopy will be discussed as well as modern applications of spectroscopy and lasers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CO: Mathematics 2000 is recommended

CR: the former CHEM 3301

LH: 3

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or a minimum 60% in either CHEM 1001 or the former CHEM 1031; Mathematics 1001 and Physics 1051 or Physics 1021

2400 Introductory Organic Chemistry I

is a course on bonding involving carbon; conformations and stereochemistry; introduction to functional groups and nomenclature; properties, syntheses and reactions of hydrocarbons, alkyl halides, alcohols and ethers.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: CHEM 2440

LH: 3

OR: 2 hours of tutorial weekly

PR: Science 1807 and Science 1808; a minimum 60% in CHEM 1051, or CHEM 1010 and the former CHEM 1011 with a grade of at least 80% in each; or the former CHEM 1011 with a grade of at least 85%; or a minimum of 60% in CHEM 1001 or the former CHEM 1031

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

COURSE NUMBER AND TITLE

Chemistry 4701 (Principles of Pharmaceutical Chemistry) Chemistry 490A/B (Honours Research in Chemistry)

RATIONALE

- 1. Addition of a third option (CHEM 3411) to fulfill prerequisites for entry into CHEM 4701. Removal of the former CHEM 3410 as an option to fulfill prerequisites.
- 2. The Usage Limitation of CHEM 490A/B outlines these courses may be taken by students not in an Honours program or without Honours standing, but the course description and prerequisite for the courses does not specifically allow for that. The language of the description and prerequisite is changed to indicate prerequisite for these students is met with the permission of the department head and a research supervisor. With this change the Usage Limitation is no longer required.

CALENDAR CHANGES

4701 Principles of Pharmaceutical Chemistry

will provide the necessary foundation of knowledge to enable students to understand the principles of drug discovery, the main pharmacokinetics properties of drugs, the relationships between the chemical structure of drugs and their biological actions, their toxicity and side-effects, and the kinetics of inhibitory mechanisms and the metabolic reactions of drugs. It will also provide an overview of pharmaceutical regulatory affairs.

PR: Biochemistry 3105 or the former CHEM 3410 or CHEM 3411 or permission of the instructor

490A/B Honours Research in Chemistry

is available only to students in Chemistry Honours or Chemistry Joint Honours Programs. These courses are two single-semester, linked courses based on independent research carried out under the supervision of a faculty member in the Department of Chemistry. Research undertaken for these courses must have a clear disconnect from any research previously conducted. These courses are mandatory for Honours Chemistry students. A grade of pass in 490A is required to proceed to 490B. A written thesis is to be handed in by the end of the course. 490A and 490B are to be taken in the Fall and Winter semesters in the same academic year.

CH: 6

PR: admission to the <u>an</u> Honours Chemistry Program or Chemistry Joint Honours Program and honours standing, <u>or for students not in an</u> Honours program or without honours standing, by permission of the Head of Department (or delegate) and a research supervisor.

UL: may be taken by students not in an Honours program or without Honours standing with the permission of the Head of the Department and a research supervisor.

CALENDAR ENTRY AFTER CHANGES 4701 Principles of Pharmaceutical Chemistry

will provide the necessary foundation of knowledge to enable students to understand the principles of drug discovery, the main pharmacokinetics properties of drugs, the relationships between the chemical structure of drugs and their biological actions, their toxicity and side-effects, and the kinetics of inhibitory mechanisms and the metabolic reactions of drugs. It will also provide an overview of pharmaceutical regulatory affairs.

PR: Biochemistry 3105 or CHEM 3411 or permission of the instructor **490A/B Honours Research in Chemistry**

is available to students in Chemistry Honours or Chemistry Joint Honours Programs. These courses are two single-semester, linked courses based on independent research carried out under the supervision of a faculty member in the Department of Chemistry. Research undertaken for these courses must have a clear disconnect from any research previously conducted. These courses are mandatory for Honours Chemistry students. A grade of pass in 490A is required to proceed to 490B. A written thesis is to be handed in by the end of the course. 490A and 490B are to be taken in the Fall and Winter semesters in the same academic year.

CH: 6

PR: admission to an Honours Chemistry Program or Chemistry Joint Honours Program and honours standing, or for students not in an Honours program or without honours standing, by permission of the Head of Department (or delegate) and a research supervisor.

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

COURSE NUMBER AND TITLE

Chemistry 3110 (Analytical Chemistry II) Chemistry 3411 (Synthetic Organic Chemistry II)

RATIONALE

Correction of typographical errors.

CALENDAR CHANGES 3110 Analytical Chemistry II

(same as the former CHEM 4110) builds upon the student's knowledge from CHEM 2100 (Analytical Chemistry I) and applies it to a more advanced level of instrumental quantitative analysis. The course examines error treatment, atomic emission an absorption spectroscopy, gas and liquid chromatography, capillary electrophoresis and supercritical fluid chromatography and extraction techniques, <u>electroanalytical electoranalytical</u> chemistry, molecular and atomic mass spectrometry, x-ray spectroscopy, ion and electron spectroscopy, surface analysis techniques and thermogravimetric analysis.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 4100, the former CHEM 4101, or the former CHEM 4110

LH: 3

PR: Science 1807 and Science 1808; CHEM 2100 or the former CHEM 3100 $\,$

3411 Synthetic Organic Chemistry I

is an introduction to organic synthesis. It covers the principles of organic synthesis and a range of reactions that are used in its pursuit. These reactions fall under the general headings of functional group interconversion (oxidation, reduction, protection, deprotection, substitution, elimination) and skeleton-building (reactions of carbon nucleophiles with electrophiles, transition <u>metal-catalyzed</u> metal-catayzed reactions, pericyclic reactions and reactions involving reactive intermediates).

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

LH: 3

PR: Science 1807 and Science 1808, CHEM 2401

CALENDAR ENTRY AFTER CHANGES 3110 Analytical Chemistry II

(same as the former CHEM 4110) builds upon the student's knowledge from CHEM 2100 (Analytical Chemistry I) and applies it to a more advanced level of instrumental quantitative analysis. The course examines error treatment, atomic emission an absorption spectroscopy, gas and liquid chromatography, capillary electrophoresis and supercritical fluid chromatography and extraction techniques, electroanalytical chemistry, molecular and atomic mass spectrometry, x-ray spectroscopy, ion and electron spectroscopy, surface analysis techniques and thermogravimetric analysis.

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

CR: the former CHEM 4100, the former CHEM 4101, or the former CHEM 4110

LH: 3

PR: Science 1807 and Science 1808; CHEM 2100 or the former CHEM 3100

3411 Synthetic Organic Chemistry I

is an introduction to organic synthesis. It covers the principles of organic synthesis and a range of reactions that are used in its pursuit. These reactions fall under the general headings of functional group interconversion (oxidation, reduction, protection, deprotection, substitution, elimination) and skeleton-building (reactions of carbon nucleophiles with electrophiles, transition metal-catalyzed reactions, pericyclic reactions and reactions involving reactive intermediates).

AR: attendance is required in the laboratory component of this course. Failure to attend may result in a failing grade or deregistration from the course.

LH: 3

PR: Science 1807 and Science 1808, CHEM 2401

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From

Business Education Engineering Grenfell Campus, Science and the Environment Chemistry Human Kinetics and Recreation Humanities and Social Sciences Marine Institute Medicine Music Nursing Pharmacy Science Biochemistry Biology **Computer Science Earth Sciences Economics** Geography **Mathematics Ocean Sciences Physics**

Psychology

Science

Social Work

Comments Received

NO NO YES – no concerns YES – secondary calendar change amendment YES – no concerns NO YES – no concerns YES – no concerns NO NO YES – no concerns YES – minor amendments NO YES – no concerns YES – no concerns NO NO NO NO YES – no concerns NO NO NO YES – no concerns

chemconsult@mun.ca

From:	chemconsult@mun.ca
Sent:	Tuesday, October 22, 2019 9:11 AM
То:	Business Administration; Education; Engineering and Applied Science; Grenfell Science
and the Environment; Hu	man Kinetics and Recreation; Humanities and Social Sciences; Library; Marine Institute; Medicine;
Music; Nursing; Pharmac	y; Science; Social Work
Cc:	'chemconsult@mun.ca'
Subject:	Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchan	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hello colleagues,

Please find attached three proposal documents for changes to the Chemistry calendar entries.

Document 1 outlines changes needed for the degree programs in Computational Chemistry. Document 2 outlines changed proposed for degree programs in Chemistry (Biological) Document 3 outlines minor bookkeeping changes (minor prerequisite changes, typo fixes and course recommendations added to programs).

Please forward any comments to <u>chemconsult@mun.ca</u>. Please also direct any questions to me at that address as well.

Thanks everyone for your time and efforts!

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry			
Memorial University of Newfoundla	nd		
St. John's, Newfoundland and Labrad	lor A1B 3X7		
Chemistry-Physics	Room C 2020	T 709 864 6939	F 709 864 3702

Peter Warburton

From:	Peter Warburton <peterw@mun.ca></peterw@mun.ca>
Sent:	Wednesday, October 23, 2019 10:47 AM
То:	Power, Barry P
Subject:	Re: Proposed Calendar changes from Chemistry

Yeah we can remove "only". My biggest reason for the change is that if we allow non-Honours students to be signed in it would be best if the prerequisite formally say that. So we can remove the UL as well...

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

On Oct 23, 2019, at 10:40 AM, Power, Barry P <b.power@mun.ca> wrote:

Hi Peter,

I had a read through 490A/B the description again, and I understand the point about the first line in the description, "is available only to students in Chemistry Honours or Chemistry Joint Honours Programs". I think we could just remove the word "only" and be done with it.

Perhaps the UL could come out altogether as well? Saying that non-honours students can be signed in I don't think would constitute a "usage limitation," do you? I think it's more appropriate to state that in the pre-requisites instead, as we are proposing to do.

We'll figure out the bureaucracy of the calendar eventually...

Barry

BARRY POWER, PhD | MANAGER OF ACADEMIC PROGRAMS / PER COURSE INSTRUCTOR

Departments of Chemistry and Earth SciencesMemorial University of NewfoundlandSt. John's, Newfoundland and Labrador| A1B 3X7Chemistry-Physics| Room C 2053 | T 709 864 8083 | F 709 864 3702Earth Sciences| Room ER 4063C | T 709 864 4464 | F 709 864 2589

From: Peter Warburton <peterw@mun.ca> Sent: Wednesday, October 23, 2019 10:19 AM To: Associate Dean of Science (Undergraduate) <adsu@mun.ca> Cc: Power, Barry P <b.power@mun.ca> Subject: Re: Proposed Calendar changes from Chemistry

My intention was to "formally" allow permission as a prerequisite for non-Honours students to be signed in. I must have missed the first part of the PR when I put the document together.

We can amend the language at meeting to clear that up, I assume?

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702

On Oct 23, 2019, at 10:10 AM, Associate Dean of Science (Undergraduate) adsu@mun.ca> wrote:

Hi Peter,

That wasn't my intent! If you would prefer the statement in the PR rather than UL then that is fine, but it really doesn't change it. It might be worthwhile thinking of changing the first sentence in the description to lighten it a bit, say remove the word "only".

Т

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

From: Peter Warburton <<u>peterw@mun.ca</u>> Sent: Wednesday, October 23, 2019 10:07 AM To: Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> Cc: Power, Barry P <<u>b.power@mun.ca</u>> Subject: Re: Proposed Calendar changes from Chemistry

Fair enough. We can remove that change...

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T 709 864 6939 | F 709 864 3702 Hi Peter and Barry,

This is about the change to CHEM 490.

The new statement makes the UL statement redundant. Also, it is inconsistent with the first sentence in the course description;

"is available only to students in Chemistry Honours or Chemistry Joint Honours Programs."

Furthermore, the new statement does nothing to aid students getting into the program easier as with that statement in the PR or the UL, students still need to be signed in.

4

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/
Peter Warburton

From:	Associate Dean of Science (Undergraduate) <adsu@mun.ca></adsu@mun.ca>
Sent:	Wednesday, October 23, 2019 9:09 PM
То:	Peter Warburton
Subject:	RE: Proposed Calendar changes from Chemistry

I know, I plagiarized your request as you might have guessed from the copy and paste wording...the special appeals committee of FoSCUgS also suggested it. What I would do is take my comment, get approval from Sunil if he approves, and have see if the chemistry CUgS also agrees and just amend the proposal so it all goes to FoSCUgS at the November meeting and then Faculty Council.

Т

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

From: Peter Warburton <peterw@mun.ca> Sent: Wednesday, October 23, 2019 5:13 PM To: Associate Dean of Science (Undergraduate) <adsu@mun.ca> Cc: Power, Barry P <b.power@mun.ca> Subject: Re: Proposed Calendar changes from Chemistry

Funny, We just did that as a course substitution for a student!

The changes I put forward were what we had on file. Can certainly amend that one in at the meeting as well.

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry Memorial University of Newfoundland St. John's, Newfoundland and Labrador | A1B 3X7 Chemistry-Physics | Room C 2020 | T <u>709 864 6939</u> |<u>F 709 864 3702</u>

On Oct 23, 2019, at 3:40 PM, Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> wrote:

Hi Peter and Barry,

This email is about the Chemistry (Biological) program.

Has the department considered adding Biology 4200 (Immunology) to the list of biology courses in 11.3.8.1.3 and 11.3.9.1.4? The course description of Immunology includes "(t)he molecular and cellular basis of allergy, autoimmunity, vaccination and cancer immunology will also be discussed" and so it would fit well within the program.

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE (Administration & Undergraduate) Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155 http://www.faculty.mun.ca/tfridgen/

Peter Warburton

From:	Rayner-Canham, Geoff <grcanham@grenfell.mun.ca></grcanham@grenfell.mun.ca>
Sent:	Friday, November 8, 2019 12:23 PM
То:	Peter Warburton
Subject:	Fw: Proposed Calendar changes from Chemistry

Hi again, Peter,

Robert is the Chair of the calendar change committee (or whatever it is called) and here is his suggestion which seems eminently sensible, for you to request the same change for the Grenfell section.

Geoff

From: Bailey, Robert F. <rbailey@grenfell.mun.ca> Sent: November 8, 2019 12:09 PM To: Rayner-Canham, Geoff <grcanham@grenfell.mun.ca> Cc: Warkentin, lan <ian.warkentin@grenfell.mun.ca> Subject: RE: Proposed Calendar changes from Chemistry

Hi Geoff (and lan),

As I mentioned previously, for the changes to CHEM 2210, 2301, 2302 and 2400, it's probably best to request a secondary change for those Calendar entries in the Grenfell section, in order that the two campuses' entries remain consistent. Any other changes (e.g. to 2440, or first-year courses) can be made in a separate proposal and considered later.

Thanks, Robert.

EXAMPLE 2 Constraints of Newfoundland Corner Brook, NL A2H 6P9, Canada

Office: AS 3022 Phone: +1 (709) 637-6293 Web: <u>http://www2.grenfell.mun.ca/rbailey/</u>

Peter Warburton

From:	Peter Warburton <peterw@mun.ca></peterw@mun.ca>
Sent:	Friday, November 8, 2019 11:46 AM
То:	'Rayner-Canham, Geoff'
Subject:	RE: MUN-StJ Calendar amendments

Hi Geoff,

Thanks for the update on that. Once I have the "official" notification I will include that in the documents to go to FoSCUgS for approval.

And sounds very good on an informal look at any changes you have coming down the pipe. Resolving issues (hopefully unlikely) beforehand certainly makes sense.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Department of Chemistry			
Memorial University of Newfor	undland		
St. John's, Newfoundland and L	abrador A1B 3X7		
Chemistry-Physics	Room C 2020	T 709 864 6939	F 709 864 3702

From: Rayner-Canham, Geoff <grcanham@grenfell.mun.ca> Sent: Friday, November 8, 2019 11:29 AM To: Peter Warburton <peterw@mun.ca> Subject: MUN-StJ Calendar amendments

Good day, Peter,

Just an informal message to let you know that the Grenfell Chemistry Group have met and we thank you for the amendment to the Chem 1001 requirement. All is good with the document from our perspective. You will have 'official' notification in due course.

We'll revise the Grenfell entries in about the next ten days (sooner if possible). I'll send them to you informally when they're ready just so that when they come through the 'official' channels any problems on your side have already been resolved.

Best wishes, Geoff

From:	Suzanne Dufour <sdufour@mun.ca></sdufour@mun.ca>
Sent:	Thursday, October 31, 2019 10:39 AM
То:	Department of Chemistry Consult; jody-Lynn Burke
Subject:	Fwd: FW: Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchan	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hi Peter,

The Biology Undergraduate Studies Committee has reviewed the proposed changes to Chemistry calendar entries. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Tel: (709) 864-8025 Fax: (709) 864-3018 https://www.mun.ca/faculty/sdufour/

From:	Engineering Consult <engrconsult@mun.ca></engrconsult@mun.ca>
Sent:	Wednesday, October 23, 2019 3:15 PM
То:	chemconsult@mun.ca
Cc:	Jayde Edmunds; Dennis Peters; Bruce Quinton
Subject:	Re: Proposed Calendar changes from Chemistry

Dear Dr. Warburton,

Thank you for the opportunity to comment on the sets of Calendar change documents for Computational Chemistry, Chemistry (Biological) and minor bookkeeping changes.

Unfortunately, your documents arrived too late for inclusion in the agenda package for today's meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science. Upon review, I find no impact on Engineering programs. I am 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

chemconsult@mun.ca

From:	Rohr, Linda <lerohr@mun.ca></lerohr@mun.ca>
Sent:	Friday, October 25, 2019 8:51 AM
То:	chemconsult@mun.ca
Subject:	Re: Proposed Calendar changes from Chemistry

Hello,

No concerns from HKR with the proposed changes to the Chemistry calendar entries.

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 PE 2027

From:	MIUG Consultations <miugconsultations@mi.mun.ca></miugconsultations@mi.mun.ca>
Sent:	Monday, November 4, 2019 1:54 PM
То:	chemconsult@mun.ca
Subject:	RE: Proposed Calendar changes from Chemistry

Hi,

Thank you for the opportunity to review and comment on these three proposals. These will have no impact on Marine Institute programs and we support the proposals.

Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

chemconsult@mun.ca

From:	cvardy@mun.ca
Sent:	Friday, November 8, 2019 3:08 PM
To:	chemconsult@mun.ca
Cc:	Margaret.Steele@med.mun.ca
Subject:	FW: Proposed Calendar changes from Chemistry
Attachments:	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf; 02
_Chemistry_Calendarchang	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Good Day

The Faculty of Medicine supports the proposed Calendar changes for Chemistry

Regards Cathy Vardy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

T 709 864 6417 | F 709 864 6336 www.med.mun.ca/

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From:	Annie Mercier <amercier@mun.ca></amercier@mun.ca>
Sent:	Tuesday, November 12, 2019 10:06 AM
То:	Department of Chemistry Consult
Subject:	Re: FW: Proposed Calendar changes from Chemistry

Dear Peter:

Our undergraduate committee is supportive of the proposed calendar changes. It is nice to see more Ocean Sciences courses being included among the choices for the degrees in Chemistry (Biological). It was suggested that the new OCSC 4200 (Marine Omics) may also be suitable.

All the best,

Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php

chemconsult@mun.ca

From:	Davis,Erin <emdavis@mun.ca></emdavis@mun.ca>
Sent:	Tuesday, October 22, 2019 11:51 AM
То:	chemconsult@mun.ca
Subject:	Proposed Calendar changes from Chemistry
Attachments: 02	01_Chemistry_Calendarchanges_ComputationalChemistryPrograms.pdf;
Chemistry_Calendarchan	ges_ChemistryBiologicalPrograms.pdf; 03

_Chemistry_Calendarchanges_ChemistryCalendarBookkeeping.pdf

Hi Peter,

Pharmacy has no concerns with the proposed changes, thank you for sending them for review.

Erin --Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca

From:	adeanugradswk <adeanugradswk@mun.ca></adeanugradswk@mun.ca>
Sent:	Wednesday, October 23, 2019 11:24 AM
То:	chemconsult@mun.ca
Subject:	RE: Proposed Calendar changes from Chemistry

Hello Peter,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

chemconsult@mun.ca

From:	Sharene Bungay <sharene@mun.ca></sharene@mun.ca>
Sent:	Thursday, November 14, 2019 8:34 AM
То:	chemconsult@mun.ca
Cc:	Hyde, Cathy
Subject:	Re: FW: Proposed Calendar changes from Chemistry

Hi Peter, The Computer Science Department supports the proposed changes and will add the Computational Chemistry major to the reserve list for the necessary courses. Regards, Sharene.

Sharene Bungay| Office: EN-2019Deputy Head (Undergraduate Studies) | Email: sharene@mun.caDepartment of Computer Science | Phone: (709) 864-6945Memorial University of Newfoundland | Web:www.cs.mun.ca/~sharene

Resource Implications

There are no resource implications associated with these changes.

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:

- \Box New course(s):
- \boxtimes Amended or deleted course(s):
- \Box 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

COMP 3200 Algorithmic Techniques for Smart Systems

COMP 3202 Introduction to Machine Learning

COMP 3401 Introduction to Data Mining

COMP 4766 Introduction to Autonomous Robotics

RATIONALE

The Statistics background required in several Computer Science prerequisites can be obtained from a number of courses and waivers are often given for courses that are equivalent to the (usually) required Statistics 2550. Here, this is made more formal by stating the "(or equivalent)" where Statistics appears as a prerequisite.

CALENDAR CHANGES

3200 Algorithmic Techniques for Smart Systems covers basic algorithmic techniques and data structures that are used to embed basic intelligent behaviors, such as problem solving, reasoning and learning in software systems and agents.

CR: the former COMP 4753 PR: COMP 2001 or the former COMP 2710, COMP 2002 or the former COMP 2711, and Statistics 1510 or Statistics 2550 Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550

3202 Introduction to Machine Learning introduces concepts and algorithms in machine learning for regression and classification tasks. The course gives the student the basic ideas and intuition behind model selection and evaluation, and selected machine learning methods such as random forests, support vector machines, and hidden Markov models.

PR: COMP 3200; or COMP 2001 or the former COMP 2710, COMP 2002 or the former COMP 2711, and <u>Statistics 2550</u> <u>Statistics 2550 or any of the courses</u> <u>listed in the credit restrictions of Statistics 2550</u>; and Mathematics 2050

3401 Introduction to Data Mining introduces students to the basic concepts and techniques for data mining and knowledge discovery. Students will develop an understanding of the essential data mining technologies, and be able to design and evaluate methods for simple data mining applications.

PR: COMP 2002 or the former COMP 2711, COMP 2007 or the former COMP 3754, and Statistics 2550 Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550

4766 Introduction to Autonomous Robotics examines the fundamental constraints, technologies, and algorithms of autonomous robotics. The focus of this course will be on computational aspects of autonomous wheeled mobile robots. The following topics will be covered: major paradigms in robotics, methods of locomotion, kinematics, simple control systems, sensor technologies, stereo vision, feature extraction, modelling uncertainty of sensors and positional information, localization, SLAM, obstacle avoidance, and 2-D path planning.

LH: 3

PR: COMP 2002 or the former COMP 2711, Mathematics 2000, Mathematics 2050, and Statistics 1510 or Statistics 2550 or the former Statistics 2510 Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550

CALENDAR ENTRY AFTER CHANGES

3200 Algorithmic Techniques for Smart Systems covers basic algorithmic techniques and data structures that are used to embed basic intelligent behaviors, such as problem solving, reasoning and learning in software systems and agents.

CR: the former COMP 4753

PR: COMP 2001 or the former COMP 2710, COMP 2002 or the former COMP 2711, and Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550

3202 Introduction to Machine Learning introduces concepts and algorithms in machine learning for regression and classification tasks. The course gives the student the basic ideas and intuition behind model selection and evaluation, and selected machine learning methods such as random forests, support vector machines, and hidden Markov models.

PR: COMP 3200; or COMP 2001 or the former COMP 2710, COMP 2002 or the former COMP 2711, and Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550; and Mathematics 2050

3401 Introduction to Data Mining introduces students to the basic concepts and techniques for data mining and knowledge discovery. Students will develop an understanding of the essential data mining technologies, and be able to design and evaluate methods for simple data mining applications.

PR: COMP 2002 or the former COMP 2711, COMP 2007 or the former COMP 3754, and Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550

4766 Introduction to Autonomous Robotics examines the fundamental constraints, technologies, and algorithms of autonomous robotics. The focus of this course will be on computational aspects of autonomous wheeled mobile robots. The following topics will be covered: major paradigms in robotics, methods of locomotion, kinematics, simple control systems, sensor technologies, stereo vision, feature extraction, modelling

uncertainty of sensors and positional information, localization, SLAM, obstacle avoidance, and 2-D path planning.

LH: 3

PR: COMP 2002 or the former COMP 2711, Mathematics 2000, Mathematics 2050, and Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
Geography	
 Mathematics and Statistics 	Expressed concerns re: wording being unclear which could lead to students seeking clarification from Math and Stats dept. As a result, wording has been changed
Ocean Sciences	
 Physics and Physical Oceanography 	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>> SENT: October 18, 2019 10:30 AM TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle <<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>; <u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse <<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to cs-ugradadv@mun.ca.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <<u>jodyb@mun.ca</u>>

Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

www.library.mun.ca [1]

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Math Consult <mathconsult@mun.ca> Sent: Friday, November 8, 2019 2:45 PM To: Hyde, Cathy <cathy@mun.ca> Subject: RE: Proposed Calendar changes from Computer Science

I think that would be okay. It has the advantage of singling out the primary course you want them to take, while also being flexible.

Tara

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

From: Hyde, Cathy Sent: Friday, November 8, 2019 1:30 PM To: 'mathconsult@mun.ca' <mathconsult@mun.ca> Subject: RE: Proposed Calendar changes from Computer Science

Hi Tara,

Thanks for your feedback, we had not considered that Math and Stats would need to deal with students trying to determine which courses are equivalent. As a result of your feedback we'd like to change the wording as follows (same wording that Biology uses):

"...and one of Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550"

What are your thoughts?

Thanks,

--

Cathy Hyde, MSc | Manager of Academic Programs, MSc Department of Computer Science Memorial University of Newfoundland Tel: (709) 864-3059 <u>www.mun.ca/computerscience/</u>

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 10:10 From: "Math Consult" <<u>mathconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Regarding the stats update to 3200, 3202, and 3401:

What do you mean by "or equivalent"?

If students have done an equivalent course at another institution then they have to get the transfer credit office to evaluate, and return a credit of "STAT 2550", in which case the "or equivalent" will be irrelevant.

STAT 2500 and STAT 2550 are credit restricted, but not equivalent.

There is a one-way credit restriction between STAT 1510 and STAT 2550, which are certainly not equivalent.

Given that students may assume that Math & Stats will decide what you deem as equivalent, I would like to avoid this phrasing if possible.

Regards,

Tara

--

Tara Stuckless

HH 3004, ext. 8914

Chair, Undergraduate Studies Committee

Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <cs-ugradadv@mun.ca>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science;

4 Joint Honours programs;

Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- \boxtimes 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

COMP 2510 Programming in C/C++

RATIONALE

The prerequisite for Computer Science 2510 requires that students have knowledge of basic programming. Several of the existing prerequisites do not provide sufficient background for students to be successful in 2510, and therefore those prerequisite options should be removed.

CALENDAR CHANGES

2510 Programming in C/C++ is a comprehensive treatment of the C/C++ programming languages. It is intended for students with some first programming experience. This course starts with a discussion of fundamentals of C and C++, moves on to the object-oriented aspects of C++, and introduces some advanced topics. It is an essential course for mastering the power of this rich programming language.

CR: Engineering 3891

LH: 3

PR: COMP 1510 or the former COMP 1550 or the former COMP 1700 or the former COMP 1710 or COMP 1000 or COMP 1001 or Engineering 1020 (or equivalent)

CALENDAR ENTRY AFTER CHANGES

2510 Programming in C/C++ is a comprehensive treatment of the C/C++ programming languages. It is intended for students with some first programming experience. This course starts with a discussion of fundamentals of C and C++, moves on to the object-oriented aspects of C++, and introduces some advanced topics. It is an essential course for mastering the power of this rich programming language.

CR: Engineering 3891 LH: 3 PR: COMP 1510 or the former COMP 1710 or COMP 1001 or Engineering 1020 (or equivalent)

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs. It was noted that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in Engineering's Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	No comment
Ocean Sciences	
 Physics and Physical Oceanography 	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>> SENT: October 18, 2019 10:30 AM TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle <<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>; <u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse <<u>DeanNurse@mun.ca</u>>; pharminfo@mun.ca; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to cs-ugradadv@mun.ca.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca>

Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

Change stats pre-requisite wording for COMP 3200, 3202, 3401 and
 4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint

major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence)

No comment.

Tara

--

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

www.library.mun.ca [1]

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- \boxtimes Amended or deleted course(s):
- \Box 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

COMP 3100 Web Programming

RATIONALE

We'd like to update the pre-requisites for COMP 3100-Web Programming to include COMP 2007-Introduction to Information Management. Knowledge of databases (as covered in COMP 2007) is required to understand and implement the backend of a website which is a fundamental component of COMP 3100.

CALENDAR CHANGES

3100 Web Programming studies the Web information system from a programming perspective. It teaches how Web data are transferred across the network, how to design interactive browser contents, and how to provide dynamic pages from the server.

CR: the former COMP 3715 PR: COMP 2006, COMP 2007

CALENDAR ENTRY AFTER CHANGES

3100 Web Programming studies the Web information system from a programming perspective. It teaches how Web data are transferred across the network, how to design interactive browser contents, and how to provide dynamic pages from the server.

CR: the former COMP 3715 PR: COMP 2006, COMP 2007

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	No comment
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse

<<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk
<<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
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- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to cs-ugradadv@mun.ca.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

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- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence) No comment.

Tara

--Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

www.library.mun.ca [1]

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891" We are happy to support the proposed changes.

Yours sincerely,

---Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- \boxtimes 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

COMP 4750 Introduction to Natural Language Processing

RATIONALE

We'd like to remove the statistics pre-requisite because any required statistics needed is covered in the course itself.

CALENDAR CHANGES

4750 Introduction to Natural Language Processing

covers tasks involving human languages, such as speech recognition, text understanding, and keyword-based information retrieval which underlie many modern computing applications and their interfaces. To be truly useful, such natural language processing must be both efficient and robust. This course will give an introduction to the algorithms and data structures used to solve key NLP tasks, including utterance understanding and generation and language acquisition, in both of the major algorithmic paradigms used today (rule-based and statistical). The emphasis will be primarily on text-based processing though speech-based processing will be addressed where possible.

PR: COMP 3719 and Statistics 1510

CALENDAR ENTRY AFTER CHANGES

4750 Introduction to Natural Language Processing

covers tasks involving human languages, such as speech recognition, text understanding, and keyword-based information retrieval which underlie many modern computing applications and their interfaces. To be truly useful, such natural language processing must be both efficient and robust. This course will give an introduction to the algorithms and data structures used to solve key NLP tasks, including utterance understanding and generation and language acquisition, in both of the major algorithmic paradigms used today (rule-based and statistical). The emphasis will be primarily on text-based processing though speech-based processing will be addressed where possible.

PR: COMP 3719

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	No comment
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca;</u> Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse

<<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk

<<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to cs-ugradadv@mun.ca.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

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www.library.mun.ca [1]

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

Change stats pre-requisite wording for COMP 3200, 3202, 3401 and
 4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence) No comment.

Tara

--

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891" We are happy to support the proposed changes.

Yours sincerely,

----Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- \boxtimes 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

COMP 2006 Computer Networking COMP 2007 Introduction to Information Management COMP 2008 Social Issues and Professional Practice

RATIONALE

COMP 2006, 2007, and 2008 are 1 credit-hour courses that were introduced with the new Computer Science undergraduate curriculum in 2016. The intention was for these courses to be taken at the same time; they are offered in the same slot with each having one lecture per week. Since these courses have different prerequisites, there has often been a big discrepancy between the enrolment numbers in a given semester, which makes scheduling and room booking somewhat difficult to predict. Making these courses co-requisites of each other should result in a near equal enrolment in each for a given semester. It is also felt that although specific knowledge beyond COMP 1003 is not required for COMP 2008, it would be beneficial for students to be in the fourth semester of their program (or later) when they take this course, and adding COMP 2006 and 2007 as prerequisites will result in such scheduling.

CALENDAR CHANGES

2006 Computer Networking introduces students to the use of programming interfaces for computer networking and to understand how the Internet works on the level of protocols. It focuses on the most commonly used of those protocols that are in the vast majority of modern computer systems.

CH: 1 CO: COMP 2004, <u>COMP 2007, COMP 2008</u> CR: the former COMP 3715 PR: COMP 2001, COMP 2002

2007 Introduction to Information Management introduces the basic knowledge needed for managing large volumes of data. It covers topics in information management and database systems from storage and retrieval to security and privacy of data.

CH: 1 CO: COMP 2004<u>, COMP 2006, COMP 2008</u> CR: the former COMP 3754 PR: COMP 2002

2008 Social Issues and Professional Practice covers ethical and social considerations of computing to provide students with the basis to address these issues

by ethical and technical actions. Case studies are used to illustrate ethical and social issues of computing.

CH: 1 <u>CO: COMP 2006, COMP 2007</u> CR: the former COMP 2760 PR: COMP 1003

CALENDAR ENTRY AFTER CHANGES

2006 Computer Networking introduces students to the use of programming interfaces for computer networking and to understand how the Internet works on the level of protocols. It focuses on the most commonly used of those protocols that are in the vast majority of modern computer systems.

CH: 1 CO: COMP 2004, COMP 2007, COMP 2008 CR: the former COMP 3715 PR: COMP 2001, COMP 2002

2007 Introduction to Information Management introduces the basic knowledge needed for managing large volumes of data. It covers topics in information management and database systems from storage and retrieval to security and privacy of data.

CH: 1 CO: COMP 2004, COMP 2006, COMP 2008 CR: the former COMP 3754 PR: COMP 2002

2008 Social Issues and Professional Practice covers ethical and social considerations of computing to provide students with the basis to address these issues by ethical and technical actions. Case studies are used to illustrate ethical and social issues of computing.

CH: 1 CO: COMP 2006, COMP 2007 CR: the former COMP 2760 PR: COMP 1003

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	No comment
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse

<<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk

<<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to <u>cs-ugradadv@mun.ca</u>.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

www.library.mun.ca [1]

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and 4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

- 8. Change a required course for Computer Science joint honours programs No comment.
- 9. Change a required course for Co-operative Internship in Computer

Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern

Cybersecurity & Applied Defence)

No comment.

Tara

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891" We are happy to support the proposed changes.

Yours sincerely,

---Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- \boxtimes 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

COMP 3200 Algorithmic Techniques for Smart Systems

REVISED COURSE NUMBER AND TITLE

COMP 3200 Algorithmic Techniques for Artificial Intelligence

ABBREVIATED COURSE TITLE

Algorithmic Techniques for AI

RATIONALE

We would like to change the course title to better reflect what is taught in the course and to market the course to students who are looking for an artificial intelligence course.

CALENDAR CHANGES

3200 <u>Algorithmic Techniques for Artificial Intelligence</u> <u>Algorithmic Techniques for</u> <u>Smart Systems</u> covers basic algorithmic techniques and data structures that are used to embed basic intelligent behaviors, such as problem solving, reasoning and learning in software systems and agents.

CR: the former COMP 4753

PR: COMP 2001 or the former COMP 2710, COMP 2002 or the former COMP 2711, and Statistics 1510 or Statistics 2550

CALENDAR ENTRY AFTER CHANGES

3200 Algorithmic Techniques for Artificial Intelligence covers basic algorithmic techniques and data structures that are used to embed basic intelligent behaviors, such as problem solving, reasoning and learning in software systems and agents.

CR: the former COMP 4753

PR: COMP 2001 or the former COMP 2710, COMP 2002 or the former COMP 2711, and Statistics 1510 or Statistics 2550

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse

<<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk

<<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to <u>cs-ugradadv@mun.ca</u>.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <<u>jodyb@mun.ca</u>> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day
The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

www.library.mun.ca [1]

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

- 8. Change a required course for Computer Science joint honours programs No comment.
- 9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence)

No comment.

Tara

--Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read

"CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

---Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- □ Amended or deleted course(s):
- □ New program(s):
- \boxtimes 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 Programs

PROGRAM TITLE

Applied Mathematics and Computer Science Joint Major

RATIONALE

Currently both Computer Science 1002 and Mathematics 2320 are listed in the Calendar as required for the Applied Math-Computer Science Joint Major. Since these courses are one-way credit-restricted, we'd like to change the requirements such that only Mathematics 2320 is required.

CALENDAR CHANGES

10.1.1 Applied Mathematics and Computer Science Joint Major

As a component of the **Degree Regulations** for the General Degree of Bachelor of Science, the following courses are required:

- Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, plus 18 further credit hours in Computer Science courses numbered 3000 or higher.
- 2. Mathematics 1000, 1001, 2000, 2050, 2051, 2130, 2260, 2320, 3000, 3100, 3132 , 3161, 3202, 4160, and 4190.

In addition, Statistics 2550 is highly recommended.

CALENDAR ENTRY AFTER CHANGES

10.1.1 Applied Mathematics and Computer Science Joint Major

As a component of the **Degree Regulations** for the General Degree of Bachelor of Science, the following courses are required:

- 1. Computer Science 1001, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, plus 18 further credit hours in Computer Science courses numbered 3000 or higher.
- 2. Mathematics 1000, 1001, 2000, 2050, 2051, 2130, 2260, 2320, 3000, 3100, 3132 , 3161, 3202, 4160, and 4190.

In addition, Statistics 2550 is highly recommended.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	Math is supportive of the proposal,
	suggestion to change stats
	recommendation to a requirement
Ocean Sciences	
 Physics and Physical Oceanography 	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse <<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to <u>cs-ugradadv@mun.ca</u>.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>> Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Hyde, Cathy Sent: Friday, November 8, 2019 4:48 PM To: 'Math Consult' <mathconsult@mun.ca> Subject: RE: FW: Proposed Calendar changes from Computer Science

Hi Tara,

Here are responses to your comments below:

7. The UG committee discussed this and thought that 35 required courses in the joint program might be too many, let's have further discussion for future consideration.

10. We've updated the wording to: "Six credit hours in other courses."

Let me know your thoughts.

Thanks,

Cathy Hyde, MSc | Manager of Academic Programs, MSc Department of Computer Science Memorial University of Newfoundland Tel: (709) 864-3059

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence)

No comment.

Tara

--Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science; 4 Joint Honours programs; Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

LIBRARY REPORT

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

www.library.mun.ca [1]

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- □ Amended or deleted course(s):
- □ New program(s):
- \boxtimes 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 Programs

PROGRAM TITLE

Computer Science and Geography Joint Honours Computer Science and Physics Joint Honours (B.Sc. Only) Computer Science and Pure Mathematics Joint Honours Computer Science and Statistics Joint Honours

RATIONALE

The new COMP 1003 course introduced in the current Calendar was intended to replace the old COMP 1000 as a degree requirement in all Computer Science programs, however, the Calendar change was accidentally omitted last year for Joint Honours programs.

CALENDAR CHANGES

10.2.14 Computer Science and Geography Joint Honours

As a component of the **Degree Regulations** for the Honours Degree of Bachelor of Science, the following courses are required:

1. Computer Science Requirements

Forty-eight credit hours in Computer Science courses are required for the Joint Honours:

- a. 1000, 1001,1002, <u>1003,</u> 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, the former 4751.
- b. Six additional credit hours in courses at the 4000 level not including 4780.
- c. Twelve additional credit hours in courses at the 3000 level or beyond.

2. Geography Requirements

Forty-eight credit hours in Geography courses are required for the Joint Honours: 1050, 2001, 2102, 2195, the former 2226, 2302, 2425, 3202, 3222, the former 3226, 3250, 3260, 3303, 4202, 4250, 4261, and the former 4291.

3. Additional Requirements

- a. Mathematics 1000, 1001, 2000, and 2050.
- b. An Honours Dissertation (either Computer Science 4780 or Geography 4999). The topic for dissertation must be chosen with the prior approval of the Heads of both Departments.

10.2.15 Computer Science and Physics Joint Honours (B.Sc. only)

The following courses are prescribed:

1. Chemistry 1050 and 1051 (or Chemistry 1010, the former 1011, and the former 1031) (or 1200 and 1001).

- 2.
- a. Computer
 Science 1000, 1001,1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 20
 07, 2008, 3731.
- b. Nine additional credit hours in Computer Science courses numbered 3000 or higher, including at least 3 credit hours in courses at the 4000 level.
- 3.
- a. Physics 1050 (or 1020) and 1051.
- b. Physics 2053, 2055, 2750, 2820, 3220, 3400, 3500, 3750, 3800, and 3820.
- c. Three additional credit hours in Physics at the 4000 level.
- 4. Physics 490A and Physics 490B or Computer Science 4780 and 3 additional credit hours in Computer Science at the 4000 level.
- 5.
- a. Mathematics 1000 and 1001.
- b. Mathematics 2000, 2050, 2260, and 3202.
- 6. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 7. Two electives to bring the total credit hours to 120. Computer Science 2500 and Statistics 2550 are recommended.

The topic for the honours project or thesis, Computer Science 4780 or Physics 490A/B, must be chosen with the prior approval of both departments.

10.2.16 Computer Science and Pure Mathematics Joint Honours

As a component of the **Degree Regulations** for the Honours Degree of Bachelor of Science, the following courses are required:

At least 51 credit hours in Computer Science courses are required including the following:

1. Computer

Science 1000,1001,<u>1003,</u>2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008.

2. Excluding 4780, 24 additional credit hours from courses numbered 3000 or higher, at least 9 credit hours of which must be in courses at the 4000 level.

The following courses in Mathematics and Statistics are required:

- 1. Mathematics 1000, 1001, 2000, 2050, 2051, 2130, 2260, 2320, 3000, 3001, 3202, 3210, 3320, 3340, Statistics 2550.
- 2. Either Mathematics 4000 or 4001.
- 3. Excluding the former Mathematics 3330, the former 4399, and 439A/B, 15 additional credit hours in courses offered by the Department of Mathematics and Statistics numbered 3000 or higher including at least 9 credit hours from courses numbered 4000 or higher and at least 9 credit hours in Pure Mathematics courses.
- 4. An Honours Dissertation in one of the departments, with the topic chosen in consultation with both departments.

Note:

There is an Undergraduate Advisor in each Department. These advisors should be consulted on all academic matters.

10.2.17 Computer Science and Statistics Joint Honours

As a component of the **Degree Regulations** for the Honours Degree of Bachelor of Science, the following courses are required:

- Mathematics 1000, 1001, 2000, 2050, 2051, 2320, 3340, Statistics 1510 or 2500 or 2550, 2410 or 3410, 2501 or 2560, 3411, 3520, 3521, 3540, 4530, 4590.
- Eighteen further credit hours in Statistics courses including at least 12 credit hours in courses numbered 4000 or higher, but not including Statistics 4581 and 459A/B.
- Computer Science 1000, 1001, <u>1003</u>, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 47 34.
- 4. Twenty-one additional credit hours in Computer Science courses at the 3000 level or higher, not including 4780.
- 5. Either Computer Science 4780 or Statistics 459A/B.

CALENDAR ENTRY AFTER CHANGES

10.2.14 Computer Science and Geography Joint Honours

As a component of the **Degree Regulations** for the Honours Degree of Bachelor of Science, the following courses are required:

1 Computer Science Requirements

Forty-eight credit hours in Computer Science courses are required for the Joint Honours:

- a. 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, the former 4751.
- b. Six additional credit hours in courses at the 4000 level not including 4780.
- c. Twelve additional credit hours in courses at the 3000 level or beyond.

2. Geography Requirements

Forty-eight credit hours in Geography courses are required for the Joint Honours: 1050, 2001, 2102, 2195, the former 2226, 2302, 2425, 3202, 3222, the former 3226, 3250, 3260, 3303, 4202, 4250, 4261, and the former 4291.

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The following courses are prescribed:

- 1. Chemistry 1050 and 1051 (or Chemistry 1010, the former 1011, and the former 1031) (or 1200 and 1001).
- 2.
- a. Computer
 Science 1001,1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 20
 08, 3731.
- b. Nine additional credit hours in Computer Science courses numbered 3000 or higher, including at least 3 credit hours in courses at the 4000 level.
- 3.
- a. Physics 1050 (or 1020) and 1051.
- b. Physics 2053, 2055, 2750, 2820, 3220, 3400, 3500, 3750, 3800, and 3820.
- c. Three additional credit hours in Physics at the 4000 level.
- 4. Physics 490A and Physics 490B or Computer Science 4780 and 3 additional credit hours in Computer Science at the 4000 level.

5.

- a. Mathematics 1000 and 1001.
- b. Mathematics 2000, 2050, 2260, and 3202.
- 6. Six credit hours in **Critical Reading and Writing (CRW)** courses, including at least 3 credit hours in English courses.
- 7. Two electives to bring the total credit hours to 120. Computer Science 2500 and Statistics 2550 are recommended.

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As a component of the **Degree Regulations** for the Honours Degree of Bachelor of Science, the following courses are required:

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- Computer Science 1001, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008.
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The following courses in Mathematics and Statistics are required:

- 1. Mathematics 1000, 1001, 2000, 2050, 2051, 2130, 2260, 2320, 3000, 3001, 3202, 3210, 3320, 3340, Statistics 2550.
- 2. Either Mathematics 4000 or 4001.
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10.2.17 Computer Science and Statistics Joint Honours

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- 2. Eighteen further credit hours in Statistics courses including at least 12 credit hours in courses numbered 4000 or higher, but not including Statistics 4581 and 459A/B.
- 3. Computer Science 1001, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 4734.
- 4. Twenty-one additional credit hours in Computer Science courses at the 3000 level or higher, not including 4780.
- 5. Either Computer Science 4780 or Statistics 459A/B.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
Geography	
Mathematics and Statistics	No comment
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca;</u> Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse

<<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk

<<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to cs-ugradadv@mun.ca.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>>

Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.
- 4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing No comment.
- 5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence) No comment.

Tara

--

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR: ------ Original Message ------ Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>> Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science;

4 Joint Honours programs;

Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

LIBRARY REPORT

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- □ Amended or deleted course(s):
- □ New program(s):
- \boxtimes 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 Programs

PROGRAM TITLE

Co-operative Internship in Computer Science (CICS)

RATIONALE

The new Computer Science 1003 course introduced in the current Calendar was intended to replace the old COMP 1000 as a degree requirement in all Computer Science programs, however, the Calendar change was accidentally omitted last year for the Co-operative Internship in Computer Science (CICS).

CALENDAR CHANGES

11.4.9 Co-operative Internship in Computer Science (CICS)

The Co-operative Internship in Computer Science (CICS) provides an opportunity for qualified students to obtain rewarding placements that help them develop practical skills in a real work setting before graduation. The CICS is available to Computer Science Majors who will typically apply between their third and fourth year of studies.

11.4.9.1 Admission Requirements

In order to be considered for admission to the CICS, an applicant:

- 1. must be a declared Computer Science Major;
- 2. must be registered as a full-time student at the time of application;
- must have successfully completed Computer Science 1000, 1001, 1002, <u>1003,</u> 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008 and 6 credit hours at the 3000 level;
- 4. must have at least 15 credit hours remaining after the internship in order to satisfy degree requirements, 3 of which must be in Computer Science; and
- 5. is expected to return to University as a full-time student after the internship.

In addition to the above, admission is also subject to academic performance.

CALENDAR ENTRY AFTER CHANGES

11.4.9 Co-operative Internship in Computer Science (CICS)

The Co-operative Internship in Computer Science (CICS) provides an opportunity for qualified students to obtain rewarding placements that help them develop practical skills in a real work setting before graduation. The CICS is available to Computer Science Majors who will typically apply between their third and fourth year of studies.

11.4.9.1 Admission Requirements

In order to be considered for admission to the CICS, an applicant:

- 1. must be a declared Computer Science Major;
- 2. must be registered as a full-time student at the time of application;
- 3. must have successfully completed Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008 and 6 credit hours at the 3000 level;
- 4. must have at least 15 credit hours remaining after the internship in order to satisfy degree requirements, 3 of which must be in Computer Science; and
- 5. is expected to return to University as a full-time student after the internship. In addition to the above, admission is also subject to academic performance.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
Geography	
Mathematics and Statistics	No comment
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;
<u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse <<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to <u>cs-ugradadv@mun.ca</u>.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>> Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

- Change stats pre-requisite wording for COMP 3200, 3202, 3401 and
 4766
 - Sent comments in a separate email.
- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

No comment.

- 5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.
- 7. Remove a required course in Applied Math Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

- 8. Change a required course for Computer Science joint honours programs No comment.
- 9. Change a required course for Co-operative Internship in Computer

Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern

Cybersecurity & Applied Defence) No comment.

Tara

--Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission; Co-operative Internship in Computer Science;

4 Joint Honours programs;

Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

LIBRARY REPORT

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \Box New course(s):
- \Box 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 Regulations

SECTION OF CALENDAR

Indicate the section of the Calendar impacted by the proposed change(s):

- □ Glossary of Terms Used in the Calendar
- □ Admission/Readmission to the University (Undergraduate)
- General Academic Regulations (Undergraduate)
- ⊠ Faculty of: Science
- □ School of:
- Department of: Computer Science
- □ Other:

RATIONALE

We have received a lot of feedback from both Science and HSS students that the current admission criteria are not clear and/or are too restrictive. Many Science students didn't realize they needed 2 Science courses in the same subject, many HSS students prefer not to do their language study courses in first year. We've updated the admission criteria to be more straightforward and to be the same for Science students and HSS students.

CALENDAR CHANGES

11.4.1 Admission to Major Programs

Admission to the Major programs in the Department of Computer Science is competitive and selective. Students who wish to enter these programs must submit a completed application form to the Department of Computer Science by June 1 for Fall semester registration.

11.4.1.1 Admission to the Bachelor of Science Program in Computer Science

To be eligible for admission to a Bachelor of Science program in Computer Science, students must have normally completed 24 credit hours as listed below:

- 1. Computer Science 1001, 1002.
- 2. Six credit hours in Critical Reading and Writing (CRW) courses, including at least 3 credit hours in English courses.
- 3. Mathematics 1000 and 1001 (or 1090 and 1000).
- 4. Six credit hours in other courses. to satisfy the second Science requirement.

Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance, normally cumulative average and performance in recent courses.

11.4.1.2 Admission to the Bachelor of Arts Program in Computer Science

To be eligible for admission to a Bachelor of Arts program in Computer Science, students must have normally completed 24 credit hours as listed below:

- 1. Computer Science 1001, 1002.
- 2.—Six credit hours to satisfy the Critical Reading and Writing (CRW) requirement, including at least 3 credit hours in English courses.
- 3. Six credit hours to satisfy the Language Study requirement.
- 4. Mathematics 1000 and 1001 (or 1090 and 1000).

Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance, normally cumulative average and performance in recent courses.

CALENDAR ENTRY AFTER CHANGES

11.4.1 Admission to Major Programs

Admission to the Major programs in the Department of Computer Science is competitive and selective. Students who wish to enter these programs must submit a completed application form to the Department of Computer Science by June 1 for Fall semester registration. To be eligible for admission, students must have normally completed 24 credit hours as listed below:

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- 2. Six credit hours in Critical Reading and Writing (CRW) courses, including at least 3 credit hours in English courses.
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- 4. Six credit hours in other courses.

Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance, normally cumulative average and performance in recent courses.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	No impact on Engineering programs
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback at this time
Human Kinetics and Recreation	No concerns
Library	No impact on Library resources
Marine Institute	Supports the proposal
Medicine	Supports the change
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions
Science	
Biochemistry	
Biology	
Chemistry	No concerns
Earth Sciences	
 Geography 	
Mathematics and Statistics	Suggested change to wording to make
	requirements more clear. Wording has
	been updated.
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

FROM: Cathy Hyde <<u>cs-ugradadv@mun.ca</u>>

SENT: October 18, 2019 10:30 AM

TO: Faculty of Humanities and Social Sciences <<u>hss@mun.ca</u>>; Shannahan, Rachelle

<<u>rshannahan@mun.ca</u>>; Collett, Meghan <<u>mcollett@mun.ca</u>>; <u>engrconsult@mun.ca</u>; Rohr, Linda <<u>lerohr@mun.ca</u>>; MIUG Consultations <<u>MIUGconsultations@mi.mun.ca</u>>;

<u>deanofmedicine@med.mun.ca</u>; Sutherland, Ian D <<u>isutherland@mun.ca</u>>; DeanNurse <<u>DeanNurse@mun.ca</u>>; <u>pharminfo@mun.ca</u>; Dean of Science <<u>deansci@mun.ca</u>>; adeanugradswk <<u>adeanugradswk@mun.ca</u>>; Library Correspondence <<u>univlib@mun.ca</u>>; Jacobsen, Ken <<u>kjacobse@grenfell.mun.ca</u>>; Dean - School of Science and the Environment <<u>ssedean@grenfell.mun.ca</u>>; Hennessey, Todd <<u>THENNESSEY@grenfell.mun.ca</u>> SUBJECT: Proposed Calendar changes from Computer Science

Hi,

The Computer Science department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

* Change stats pre-requisite wording for COMP 3200, 3202, 3401 and

4766

- * Change pre-requisites for COMP 2510: Programming in C/C++
- * Adding pre-requisite to COMP 3100: Web Programming
- * Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing
- * Change COMP 2006, 2007 and 2008 to be co-requisites
- * Rename COMP 3200: Algorithmic Techniques for Smart Systems
- * Remove a required course in Applied Math Computer Science joint major
- * Change a required course for Computer Science joint honours programs
- * Change a required course for Co-operative Internship in Computer Science program
- * Change Computer Science major admission requirements to be less restrictive
- * Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors
- * Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied

Defence)

Please send your comments on these proposals to cs-ugradadv@mun.ca.

If you have any questions, please feel free to contact me. Thanks,

CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS

Department of Computer Science

Memorial University of Newfoundland

Tel: (709) 864-3059

Biology:

------ Original Message ------Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: Suzanne Dufour <<u>sdufour@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>, "jodyb@mun.ca" <jodyb@mun.ca> Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Chemistry:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-11-05 14:55 From: <<u>chemconsult@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

Other than the feedback provided on October 18th (attached as Outlook item for completeness) regarding "11 CS course restrictions for majors and minors" where Computational Chemistry degree program students would need to be able to register for CS 2001 and CS 2002 and so restricting those courses to only Computer Science majors would be problematic, Chemistry has no other concerns with the other 11 proposal documents.

Take care,

PETER WARBURTON, PhD | ASSISTANT PROFESSOR AND DEPUTY HEAD (UNDERGRADUATE)

Medicine:

------ Original Message ------Subject: FW: Proposed Calendar changes from Computer Science Date: 2019-10-18 12:45 From: <<u>cvardy@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>> Cc: <<u>Margaret.Steele@med.mun.ca</u>> Good Day

The attached proposed calendar changes for Computer Science have been reviewed and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-20 17:43 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

With respect to changes 1 through 11, these will have no impact on library resources.

With respect to change 12 (Modern Cybersecurity & Applied Defence), it appears that our journal subscriptions in this area are fairly limited and our capacity to take on new subscriptions is quite low. Could I please be put in touch with whoever is developing this course? A conversation with him/her might help me to better understand and assess the needs.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

QEII Library

Memorial Univeristy of Newfoundland

+1 709 864-7125

School of Fine Arts:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 11:19 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello

Thanks for the opportunity to review this package; the School of Fine Arts has no feedback at this time.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts

Grenfell Campus, Memorial University

Marine Institute:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-21 13:46 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the proposals for changes to Computer Science. This will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Hyde, Cathy Sent: Friday, November 8, 2019 4:48 PM To: 'Math Consult' <mathconsult@mun.ca> Subject: RE: FW: Proposed Calendar changes from Computer Science

Hi Tara,

Here are responses to your comments below:

7. The UG committee discussed this and thought that 35 required courses in the joint program might be too many, let's have further discussion for future consideration.

10. We've updated the wording to: "Six credit hours in other courses."

Let me know your thoughts.

Thanks,

Cathy Hyde, MSc | Manager of Academic Programs, MSc Department of Computer Science Memorial University of Newfoundland Tel: (709) 864-3059

From: Math Consult <<u>mathconsult@mun.ca</u>> Sent: Monday, October 21, 2019 3:38 PM To: <u>cs-ugradadv@mun.ca</u> Subject: RE: Proposed Calendar changes from Computer Science

Hi Cathy,

Comments from Math & Stats:

- 1. Change stats pre-requisite wording for COMP 3200, 3202, 3401 and
- 4766

Sent comments in a separate email.

- 2. Change pre-requisites for COMP 2510: Programming in C/C++ No comment.
- 3. Adding pre-requisite to COMP 3100: Web Programming No comment.

4. Removing a pre-requisite from COMP 4750: Introduction to Natural Language Processing

No comment.

5. Change COMP 2006, 2007 and 2008 to be co-requisites No comment.

7. Remove a required course in Applied Math – Computer Science joint major

We are happy with this proposal.

Do you think with this removal, that we could change the statistics recommendation to a requirement? We don't need to include this for this change if there is not time, but I'll put it to our undergrad studies committee for this (time permitting) or future consideration.

8. Change a required course for Computer Science joint honours programs No comment.

9. Change a required course for Co-operative Internship in Computer Science program

No comment.

10. Change Computer Science major admission requirements to be less restrictive

Instead of "4. Six credit hours of electives.", might you say "4. Six credit hours of electives or core degree requirements", or "4. Six credit hours in other courses." Not sure if this is necessary, but sometimes students have a hard time understanding what counts as an "elective". Is a core degree requirement an elective?

11. Restrict COMP 2001, 2002 and 2003 to Computer Science majors and minors

No comment.

12. Addition of a new Selected Topics course (COMP 4820: Modern Cybersecurity & Applied Defence) No comment.

Tara

--Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

------ Original Message ------Subject: Proposed Calendar changes from Computer Science Date: 2019-10-21 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <cs-ugradadv@mun.ca>

Hello Cathy,

The School of Pharmacy has no concerns with the proposed changes and do not believe they will affect us, thank you for sending them for review.

Erin

Erin Davis, PharmD

Associate Dean Undergraduate Studies

HKR:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-21 20:20 From: "Rohr, Linda" <<u>lerohr@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

Linda

LINDA E. ROHR PhD

Dean, School of Human Kinetics & Recreation

Social Work:

------ Original Message ------Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-23 11:26 From: "adeanugradswk" <<u>adeanugradswk@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather___

HEATHER J. HAIR, PHD, RSW

Associate Dean Undergraduate Programs

School of Social Work, Memorial University

Engineering:

------ Original Message ------Subject: Re: Proposed Calendar changes from Computer Science Date: 2019-10-23 15:11 From: "Engineering Consult" <<u>engrconsult@mun.ca</u>> To: "Cathy Hyde" <<u>cs-ugradadv@mun.ca</u>> Cc: "Jayde Edmunds" <<u>edmundsj@mun.ca</u>>, "Dennis Peters" <<u>dpeters@mun.ca</u>>, "Bruce Quinton" <<u>bruce.quinton@mun.ca</u>>

Dear Ms. Hyde,

Thank you for the opportunity to comment on the sets of Calendar change documents for Admission;Co-operative Internship in Computer Science;4 Joint Honours programs;Applied Mathematics and Computer Science Joint Major; and 15 courses.

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 do note that the credit restriction in COMP 2510 will be updated, in accordance with secondary Calendar changes in our Calendar proposal to implement departmental course codes in Engineering. That credit restriction will read "CR: Electrical and Computer Engineering 3400, the former Engineering 3891"

We are happy to support the proposed changes.

Yours sincerely,

Dr. Glyn George, Chair Committee on Undergraduate Studies Faculty of Engineering and Applied Science Memorial University of Newfoundland

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Not applicable

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:

- \boxtimes New course(s):
- \Box Amended or deleted course(s):
- \Box 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

3602 Introduction to the Theory of Computation

ABBREVIATED COURSE TITLE

Intro. Theory of Computation

RATIONALE

COMP 3602 addresses complexity and limitations of algorithmic problem solving relative to a variety of computational resources and machine models. It provides a formal introduction to theory of computation, presenting abstract machine models, the basics of computability theory and complexity theory. Some of the content of this course is covered in COMP 3719, which is a course that was required as a part of the old (pre-2016) Computer Science undergraduate curriculum. Since COMP 3719 is no longer a required course and was created to include two main areas of Computer Science (algorithms and theory) the department felt that it would be best to separate the content of 3719 into two third year courses, one covering each area (see COMP 3600 proposal).

CALENDAR CHANGES

<u>3602 Introduction to the Theory of Computation examines various models of</u> <u>computation and their computational power. Several measures of a problem's</u> <u>computational difficulty will be discussed.</u>

PR: COMP 2002

CR: the former COMP 3719

CALENDAR ENTRY AFTER CHANGES

3602 Introduction to the Theory of Computation examines various models of computation and their computational power. Several measures of a problem's computational difficulty will be discussed.

PR: COMP 2002

CR: the former COMP 3719

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	Supports proposed change
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback
Human Kinetics and Recreation	No concern
Library	
Marine Institute	Support proposal
Medicine	
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions or comments
Science	
Biochemistry	
Biology	No concerns
Chemistry	
Earth Sciences	
• Geography	
Mathematics and Statistics	
Ocean Sciences	No impact
Physics and Physical Oceanography	

Biology:

Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: "Suzanne Dufour" <<u>sdufour@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>, <<u>jodyb@mun.ca</u>>

Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Engineering:

From: CS Ugrad <cs-ugradadv@mun.ca> Sent: Wednesday, November 13, 2019 6:51 PM To: Engineering Consult <engrconsult@mun.ca> Subject: Re: Proposed Calendar changes from Computer Science

Hi,

Thank-you for your review and feedback. The Computer Science Undergraduate Studies Committee discussed the possibility of a mutual credit restriction between COMP 3600 and ENGI 5892 (soon to be ECE 5400). It was felt that, while there is overlap between the two courses, ENGI 5892 is a breadth course and COMP 3600 is more in-depth so there is insufficient overlap to warrant a credit restriction. Let me know your thoughts, thanks.

--

Cathy Hyde, MSc | Manager of Academic Programs, MSc Department of Computer Science Memorial University of Newfoundland Tel: (709) 864-3059 www.mun.ca/computerscience/

-----Original Message-----From: Engineering Consult <<u>engrconsult@mun.ca</u>> Sent: Monday, October 28, 2019 9:01 AM To: <u>cs-ugradadv@mun.ca</u> Cc: Jayde Edmunds <<u>edmundsj@mun.ca</u>>; Dennis Peters <<u>dpeters@mun.ca</u>>; Bruce Quinton <<u>bruce.quinton@mun.ca</u>> Subject: Re: Proposed Calendar changes from Computer Science

Dear Ms. Hyde,

Thank you for the opportunity to comment on the three additional sets of Calendar change documents for Computer Science.

Unfortunately, your documents arrived too late for inclusion in the agenda package for the October meeting of the Committee on Undergraduate

Studies of the Faculty of Engineering and Applied Science. The next scheduled meeting is not until Nov. 20.

Our Associate Dean (Undergraduate Studies) suggests the possibility of a mutual credit restriction between COMP 3600 and ENGI 5892 (soon to be ECE 5400). The two course descriptions are:

3600 Algorithm Design and Analysis covers advanced algorithm design techniques, including divide-andconquer, greedy algorithms, dynamic programming and network flows. The emphasis is on algorithmic problem solving and algorithm design and analysis methodologies, rather than on specific algorithms. NP-completeness and methods for dealing with intractability will also be discussed. PR: COMP 2002 CR: the former COMP 4740

and

5400 Algorithms: Correctness and Complexity (same as the former ENGI 5892 and the former ENGI 6892) presents fundamental theories and practices for the design of correct and efficient computing systems, including specification of computing systems and their components, correctness with respect to specifications; methods of verification; algorithmic problem solving strategies (such as divide and conquer, dynamic programming); tractability and intractability of computational problems. CR: the former ENGI 5892 and the former ENGI 6892 OR: tutorial one hour per week

PR: ECE 4110 or the former ENGI 4424, ECE 4400 or the former ENGI 4892

Otherwise, we find no impact on Engineering programs. I am 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

Grenfell Fine Arts:

Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-24 14:43 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy Thanks for this - no feedback from Fine Arts!

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts Grenfell Campus, Memorial University Corner Brook, Newfoundland 709.637.6277 www.grenfell.mun.ca

HKR:

From: Rohr, Linda <lerohr@mun.ca>
Sent: Friday, October 25, 2019 8:53 AM
To: cs-ugradadv@mun.ca
Subject: Re: Proposed Calendar changes from Computer Science

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

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

PE 2027

Marine Institute:

Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-25 15:26 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the Calendar Change Proposals for Computer Science. These will have no impact on Marine Institute programs and we support the proposals.

Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

Ocean Sciences:

Subject: Re: FW: Proposed Calendar changes from Computer Science Date: 2019-11-12 09:54 From: Annie Mercier <amercier@mun.ca> To: cs-ugradadv@mun.ca

Dear Cathy:

We have looked at your proposals, which do not impact any of the courses or programs in the Department of Ocean Sciences, and we have no issues with the proposed changes.

All the best, Annie

Annie Mercier, PhD Professor and Deputy Head, **Department of Ocean Sciences** Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: amercier@mun.ca www.mun.ca/osc/amercier/bio.php [2]

Pharmacy:

Subject: Proposed Calendar changes from Computer Science Date: 2019-10-25 15:04 From: "Davis,Erin" <emdavis@mun.ca> To: <cs-ugradadv@mun.ca>

Hi Cathy,

The School of Pharmacy has no concerns with the proposed changes. I don't believe they will affect our students or programs.

Erin

Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca

Social Work: Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-11-11 20:21 From: adeanugradswk <<u>adeanugradswk@mun.ca</u>> To: "<u>cs-ugradadv@mun.ca</u>" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

LIBRARY REPORT

Not yet received.

RESOURCE IMPLICATIONS

None. This course can be taught by current faculty members within their regular teaching assignment.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Sample Course Outline and Method of Evaluation

- Regular languages and finite automata (6 hours)
- Context-free languages and pushdown automata (5 hours)
- Turing machines, undecidability, many-one reductions (6 hours)
- Complexity theory, polynomial-time reductions, P vs. NP (6 hours)
- Other topics, including recursion theorem, space complexity, circuit complexity, parameterized complexity, basic cryptography (8 hours)

Method of Evaluation:

- Assignments (6) 40%Term test 20%
- Final exam 40%

Texts

Michael Sipser "Introduction to the Theory of Computation" 3rd edition, Cengage, 2012.

Instructor(s)

Manrique Mata-Montero, Antonina Kolokolova, T. Wareham, M. Bartha

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:

- \boxtimes New course(s):
- \Box Amended or deleted course(s):
- \Box 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

3600 Algorithm Design and Analysis

ABBREVIATED COURSE TITLE

Alg. Design and Analysis

RATIONALE

COMP 3600 is intended to refine the student's ability to solve computational problems algorithmically; it goes beyond specific algorithms to cover general methods of algorithm design and analysis and algorithmic problem solving. Some of the content of this course is covered in COMP 3719, which is a course that was required as a part of the old (pre-2016) Computer Science undergraduate curriculum. Since COMP 3719 is no longer a required course and was created to include two main areas of Computer Science (algorithms and theory) the department felt that it would be best to separate the content of 3719 into two third year courses, one covering each area (see COMP 3602 proposal).

CALENDAR CHANGES

3600 Algorithm Design and Analysis covers advanced algorithm design techniques, including divide-and-conquer, greedy algorithms, dynamic programming and network flows. The emphasis is on algorithmic problem solving and algorithm design and analysis methodologies, rather than on specific algorithms. NP-completeness and methods for dealing with intractability will also be discussed.

PR: COMP 2002

CR: the former COMP 4740

CALENDAR ENTRY AFTER CHANGES

3600 Algorithm Design and Analysis covers advanced algorithm design techniques, including divide-and-conquer, greedy algorithms, dynamic programming and network flows. The emphasis is on algorithmic problem solving and algorithm design and analysis methodologies, rather than on specific algorithms. NP-completeness and methods for dealing with intractability will also be discussed.

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Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	Supports proposed change, suggested a new credit restriction
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback
Human Kinetics and Recreation	No concern
Library	
Marine Institute	Support proposal
Medicine	
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions or comments
Science	
Biochemistry	
Biology	No concerns
Chemistry	
Earth Sciences	
• Geography	
Mathematics and Statistics	
Ocean Sciences	No impact
Physics and Physical Oceanography	

Biology:

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Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

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Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

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School of Fine Arts Grenfell Campus, Memorial University Corner Brook, Newfoundland 709.637.6277 www.grenfell.mun.ca

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Linda E. Rohr PhD

Dean, School of Human Kinetics & Recreation

Memorial University

t: 709.864.8129 f: 709.864.7531 e: lerohr@mun.ca

PE 2027

Marine Institute:

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Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

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Annie Mercier, PhD Professor and Deputy Head, **Department of Ocean Sciences** Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: amercier@mun.ca www.mun.ca/osc/amercier/bio.php [2]

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Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca
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Heather

Heather J. Hair, PhD, RSW Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

LIBRARY REPORT

Not yet received

RESOURCE IMPLICATIONS

None. This course can be taught by current faculty members within their regular teaching assignment.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

Sample Course Outline and Method of Evaluation

- Greedy algorithms (4 hours)
- Divide and conquer (6 hours)
- Dynamic programming (5 hours)
- Network flows (4 hours)
- Notion of NP-completeness, examples of reductions (6 hours)
- Dealing with intractability: approximation algorithms, heuristics, randomized algorithms (5 hours)

Method of Evaluation:

- Assignments (6) 40%
- Term test 20%
- Final exam 40%

Texts

J. Kleinberg and E. Tardos, "Algorithm Design", 2011, Prentice Hall.

T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein "Introduction to Algorithms", 3rd edition, MIT Press 2009.

Instructor(s)

Manrique Mata-Montero, Antonina Kolokolova, Miklos Bartha, Todd Wareham

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:

- \Box New course(s):
- \boxtimes 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
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- □ New, amended or deleted Faculty, School or Departmental regulations
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ADMINISTRATIVE AUTHORIZATION

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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

RATIONALE

We propose to delete COMP 3719 (a course in the old pre-2016 curriculum) and to replace it with two 3000-level courses (see proposals for COMP 3600 and COMP 3602). As a result of this deletion a number of 4000-level courses require a prerequisite change. We also propose to delete 4000-level courses that are no longer required and/or have overlap with newer courses (COMP 4740, 4756, 4762).

CALENDAR CHANGES

3719 Theory of Computation and Algorithms is an introduction to formal algorithmic problem solving. Various algorithm design techniques that sometimes yield efficient solutions are studied. Deterministic and nondeterministic machines (finite state automata, pushdown automata and Turing machines) are discussed and used to efficiently solve problems such as the String Matching Problem, the parsing of Context-free Languages, and to introduce the theory of NP-completeness. In addition, Turing machines are used to prove the unsolvability of certain problems. Tractable, intractable and undecidable problems are contrasted. Basic issues related to parallelization are discussed as well.

CR: the former COMP 3711 and the former COMP 3740 PR: COMP 2711 or COMP 2002; and Mathematics 2320 or COMP 1002

4711 Structure of Programming Languages covers programming language design considerations; syntactic and semantic structure; survey of typical features and operations; analysis of facilities for control and data structuring; language extensibility; execution models; formal specification of programming languages. PR: <u>COMP 2003 or the former COMP 3724, and COMP 3602 or the former COMP 3719 COMP 3719, COMP 2003 or the former COMP 3724</u>

4712 Compiler Construction studies properties of formal grammars and languages; syntax-directed parsing and code generation; top-down and bottom-up parsing methods; LL(k) and LR(k) grammars and parsers; Code optimization; compiler writing tools.

PR: <u>COMP 2003 or the former COMP 3724</u>, and three credit hours in Computer <u>Science at the 3000-level or above (COMP 3600 is recommended)</u> <u>COMP 3719</u>, <u>COMP 2003 or the former COMP 3724</u>

4740 Design and Analysis of Algorithms will give an overview of techniques for the design of efficient optimal-solution and heuristic algorithms. It will include an introduction to various advanced data structures for set and string processing that are used to further optimize algorithm efficiency. PR: COMP 3719 **4741 Formal Languages and Computability** is an in-depth study of various types of formal machines and their associated languages. Effective computability and other formalisms, such as lambda calculus will be studied as well. CR: the former COMP 3740 PR: <u>COMP 3602 or the former COMP 3719</u>

4742 Computational Complexity is an in-depth discussion of computational complexity theory. Topics covered in the course include: models of computation (for both serial and parallel computations); complexity measures; reducibility; complexity classes (NP, PSPACE, NC, LOGSPACE and P); and randomized computations. PR: <u>COMP 3602 or the former</u> COMP 3719

4743 Graph Algorithms and Combinatorial Optimization discusses classical problems in combinatorial optimization and graph algorithms, including matching, colorability, independent sets, isomorphism, network flows and scheduling. Special families of graphs are discussed and algorithms that would otherwise be NP-hard or complete are shown to be polynomial time when restricted to such families. PR: <u>COMP 3600 or the former</u> COMP 3719

4750 Introduction to Natural Language Processing covers tasks involving human languages, such as speech recognition, text understanding, and keyword-based information retrieval which underlie many modern computing applications and their interfaces. To be truly useful, such natural language processing must be both efficient and robust. This course will give an introduction to the algorithms and data structures used to solve key NLP tasks, including utterance understanding and generation and language acquisition, in both of the major algorithmic paradigms used today (rule-based and statistical). The emphasis will be primarily on text-based processing though speechbased processing will be addressed where possible.

PR: COMP 3600 or the former COMP 3719 and Statistics 1510

4756 Image Processing will centre on the key analytical and algorithmic tools and concepts of digital image processing. Topics will include Transformations, Enhancement, Encoding, Data Bases, Segmentation and Description. CR: Engineering 7854 LH: 3 PR: COMP 3719

4762 Introduction to Computational Molecular Biology will give an overview of computational problems and algorithms for these problems associated with a variety of analyses of biological molecular data. PR: COMP 3719

CALENDAR ENTRY AFTER CHANGES

4711 Structure of Programming Languages covers programming language design considerations; syntactic and semantic structure; survey of typical features and operations; analysis of facilities for control and data structuring; language extensibility; execution models; formal specification of programming languages.

PR: COMP 2003 or the former COMP 3724, and COMP 3602 or the former COMP 3719

4712 Compiler Construction studies properties of formal grammars and languages; syntax-directed parsing and code generation; top-down and bottom-up parsing methods; LL(k) and LR(k) grammars and parsers; Code optimization; compiler writing tools.

PR: COMP 2003 or the former COMP 3724, and three credit hours in Computer Science at the 3000-level or above (COMP 3600 is recommended)

4741 Formal Languages and Computability is an in-depth study of various types of formal machines and their associated languages. Effective computability and other formalisms, such as lambda calculus will be studied as well. CR: the former COMP 3740 PR: COMP 3602 or the former COMP 3719

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SECONDARY CALENDAR CHANGES

None

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Business Administration	
Education	
Engineering and Applied Science	Supports proposed change
Grenfell Campus (Arts & Social Sciences)	
Grenfell Campus (Science and the Environment)	
Grenfell Campus (Fine Arts)	No feedback
Human Kinetics and Recreation	No concern
Library	
Marine Institute	Support proposal
Medicine	
Music	
Nursing	
Pharmacy	No concerns
Social Work	No suggestions or comments
Science	
Biochemistry	
Biology	No concerns
Chemistry	
Earth Sciences	
 Geography 	
 Mathematics and Statistics 	
Ocean Sciences	No impact
Physics and Physical Oceanography	

Biology:

Subject: Fwd: FW: Proposed Calendar changes from Computer Science Date: 2019-10-31 11:50 From: "Suzanne Dufour" <<u>sdufour@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>, <<u>jodyb@mun.ca</u>>

Hi Cathy,

The Biology Undergraduate Studies Committee has reviewed the proposed calendar changes from Computer Sciences. We have no concerns with those changes.

Best wishes,

Suzanne

--

Dr. Suzanne Dufour

Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

Engineering:

From: CS Ugrad <cs-ugradadv@mun.ca> Sent: Wednesday, November 13, 2019 6:51 PM To: Engineering Consult <engrconsult@mun.ca> Subject: Re: Proposed Calendar changes from Computer Science

Hi,

Thank-you for your review and feedback. The Computer Science Undergraduate Studies Committee discussed the possibility of a mutual credit restriction between COMP 3600 and ENGI 5892 (soon to be ECE 5400). It was felt that, while there is overlap between the two courses, ENGI 5892 is a breadth course and COMP 3600 is more in-depth so there is insufficient overlap to warrant a credit restriction. Let me know your thoughts, thanks.

--

Cathy Hyde, MSc | Manager of Academic Programs, MSc Department of Computer Science Memorial University of Newfoundland Tel: (709) 864-3059 www.mun.ca/computerscience/

-----Original Message-----From: Engineering Consult <<u>engrconsult@mun.ca</u>> Sent: Monday, October 28, 2019 9:01 AM To: <u>cs-ugradadv@mun.ca</u> Cc: Jayde Edmunds <<u>edmundsj@mun.ca</u>>; Dennis Peters <<u>dpeters@mun.ca</u>>; Bruce Quinton <<u>bruce.quinton@mun.ca</u>> Subject: Re: Proposed Calendar changes from Computer Science

Dear Ms. Hyde,

Thank you for the opportunity to comment on the three additional sets of Calendar change documents for Computer Science.

Unfortunately, your documents arrived too late for inclusion in the agenda package for the October meeting of the Committee on Undergraduate

Studies of the Faculty of Engineering and Applied Science. The next scheduled meeting is not until Nov. 20.

Our Associate Dean (Undergraduate Studies) suggests the possibility of a mutual credit restriction between COMP 3600 and ENGI 5892 (soon to be ECE 5400). The two course descriptions are:

3600 Algorithm Design and Analysis covers advanced algorithm design techniques, including divide-andconquer, greedy algorithms, dynamic programming and network flows. The emphasis is on algorithmic problem solving and algorithm design and analysis methodologies, rather than on specific algorithms. NP-completeness and methods for dealing with intractability will also be discussed. PR: COMP 2002 CR: the former COMP 4740

and

5400 Algorithms: Correctness and Complexity (same as the former ENGI 5892 and the former ENGI 6892) presents fundamental theories and practices for the design of correct and efficient computing systems, including specification of computing systems and their components, correctness with respect to specifications; methods of verification; algorithmic problem solving strategies (such as divide and conquer, dynamic programming); tractability and intractability of computational problems. CR: the former ENGI 5892 and the former ENGI 6892 OR: tutorial one hour per week

PR: ECE 4110 or the former ENGI 4424, ECE 4400 or the former ENGI 4892

Otherwise, we find no impact on Engineering programs. I am 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

Grenfell Fine Arts:

Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-24 14:43 From: "Hennessey, Todd" <<u>THENNESSEY@grenfell.mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy Thanks for this - no feedback from Fine Arts!

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts Grenfell Campus, Memorial University Corner Brook, Newfoundland 709.637.6277 www.grenfell.mun.ca

HKR:

From: Rohr, Linda <lerohr@mun.ca>
Sent: Friday, October 25, 2019 8:53 AM
To: cs-ugradadv@mun.ca
Subject: Re: Proposed Calendar changes from Computer Science

Hi Cathy,

No concerns from HKR with the proposed calendar changes from Computer Science.

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

PE 2027

Marine Institute:

Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-10-25 15:26 From: "MIUG Consultations" <<u>MIUGconsultations@mi.mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hello,

Thank you for the opportunity to review and comment on the Calendar Change Proposals for Computer Science. These will have no impact on Marine Institute programs and we support the proposals.

Regards, Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

Ocean Sciences:

Subject: Re: FW: Proposed Calendar changes from Computer Science Date: 2019-11-12 09:54 From: Annie Mercier <<u>amercier@mun.ca</u>> To: <u>cs-ugradadv@mun.ca</u>

Dear Cathy:

We have looked at your proposals, which do not impact any of the courses or programs in the Department of Ocean Sciences, and we have no issues with the proposed changes.

All the best, Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php [2]

Pharmacy:

Subject: Proposed Calendar changes from Computer Science Date: 2019-10-25 15:04 From: "Davis,Erin" <<u>emdavis@mun.ca</u>> To: <<u>cs-ugradadv@mun.ca</u>>

Hi Cathy,

The School of Pharmacy has no concerns with the proposed changes. I don't believe they will affect our students or programs.

Erin

--Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca **Social Work:** Subject: RE: Proposed Calendar changes from Computer Science Date: 2019-11-11 20:21 From: adeanugradswk <<u>adeanugradswk@mun.ca</u>> To: "<u>cs-ugradadv@mun.ca</u>" <<u>cs-ugradadv@mun.ca</u>>

Hello Cathy,

I have reviewed your calendar changes and have no suggestions or comments.

Regards,

Heather

Heather J. Hair, PhD, RSW Associate Dean Undergraduate Programs School of Social Work, Memorial University St. John's, NL, Canada, A1C 5S7 T: 709-864-2562 or 709-864-7349

LIBRARY REPORT

Not required

RESOURCE IMPLICATIONS None

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS N/A

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:

- \Box New course(s):
- \mathbf{X} Amended or deleted course(s):
- □ New program(s):
- \Box 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

STAT 1510 Statistical Thinking and Concepts

RATIONALE

One of the goals of STAT 1510 is to attract first year students to statistics. However, the required 90 minute lab makes it difficult for students to fit this course in their schedules (as many of them already have required labs in physics, chemistry, and/or biology), and enrollment is low as a result. The lab can be eliminated without changing the objectives of the course (later courses in Statistics teach students to use a variety of statistical software packages), with the benefit of allowing more students to take this course and be exposed to statistics early on.

CALENDAR CHANGES

1510 Statistical Thinking and Concepts examines the basic statistical issues encountered in everyday life, such as data collection (both primary and secondary), ethical issues, planning and conducting statistically-designed experiments, understanding the measurement process, data summarization, measures of central tendency and dispersion, basic concepts of probability, discrete probability models, understanding sampling distributions, the central limit theorem based on simulations (without proof), linear regression, concepts of confidence intervals and testing of hypotheses. Statistical software will be used to demonstrate each technique.

CO: Mathematics 1000 CR: cannot receive credit for STAT 1510 if completed with, or subsequent to, STAT 2500, 2550 or the former 2510 LH: one 90 minute lab per week

CALENDAR ENTRY AFTER CHANGES

1510 Statistical Thinking and Concepts examines the basic statistical issues encountered in everyday life, such as data collection (both primary and secondary), ethical issues, planning and conducting statistically-designed experiments, understanding the measurement process, data summarization, measures of central tendency and dispersion, basic concepts of probability, discrete probability models, understanding sampling distributions, the central limit theorem based on simulations (without proof), linear regression, concepts of confidence intervals and testing of hypotheses. Statistical software will be used to demonstrate each technique.

CO: Mathematics 1000

CR: cannot receive credit for STAT 1510 if completed with, or subsequent to, STAT 2500, 2550 or the former 2510

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Unit	Feedback
Humanities and Social	
Sciences	
Business Administration	
Education	
Engineering and Applied	
Science	
Human Kinetics and	no
Recreation	concerns
Marino Instituto	no
	concerns
Medicine	
Music	
Nursing	
Pharmacy	no
Thatmacy	concerns
Science	yes,
	attached
Social Work	
Library	
Grenfell Campus	
Arts and Social Science	
Science and the Environment	
Fine Arts	

RESOURCE IMPLICATIONS None.

From:	Annie Mercier <amercier@mun.ca></amercier@mun.ca>
Sent:	Thursday, November 14, 2019 12:03 PM
То:	Math Consult
Subject:	Re: FW: Consultation on Calendar Change: STAT 1510

Hi Tara:

Many thanks for the response; I will pass it along.

All the best, Annie

On 14-Nov.-2019 11:57 a.m., Math Consult wrote:

Hi Annie,

Our Statistics deputy head says the following:

"Data visualization is a very important part to present statistical results and the course instructor will use statistical software to illustrate statistical techniques.

The instructor will also schedule a few classes taught in a computer lab, and give students a chance to learn some elementary knowledge of relevant statistical packages and do some data visualization by themselves.

The students will learn more about the potentials of statistical applications in their future career or everyday life. Hopefully this will draw their interests to the area of statistics."

So, there will be some hands-on experience, but not with a scheduled lab.

Thanks very much for your feedback, Tara

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

From: Annie Mercier [mailto:amercier@mun.ca]
Sent: Tuesday, November 12, 2019 9:49 AM
To: Math Consult smallt@mun.ca
Subject: Re: FW: Consultation on Calendar Change: STAT 1510

Hi Tara:

Our committee has reviewed your proposal and we are overall supportive, although some felt it was a shame to remove hands-on experience.

All the best,

Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php

On 08-Nov.-2019 1:27 p.m., Dean of Science wrote:

----Original Message----From: Math Consult [mailto:mathconsult@mun.ca]
Sent: Friday, November 8, 2019 1:19 PM
Subject: Consultation on Calendar Change: STAT 1510
Dear Colleagues,
Your feedback on the attached calendar change proposal is
appreciated.
Summary: Removal of lab hour component to STAT 1510.
Comments may be sent to mathconsult@mun.ca.
Regards,
Tara
-Undergraduate Studies Committee

Dept. of Mathematics and Statistics

From:	Math Consult <mathconsult@mun.ca></mathconsult@mun.ca>
Sent:	Thursday, November 14, 2019 11:57 AM
То:	'MIUG Consultations'
Cc:	'Derek Howse'
Subject:	RE: Consultation on Calendar Change: STAT 1510

Hello,

I asked our Statistics deputy head to respond to your comment. This is what he had to say:

" Data visualization is a very important part to present statistical results and the course instructor will use statistical software to illustrate statistical techniques.

The instructor will also schedule a few classes taught in a computer lab, and give students a chance to learn some elementary knowledge of relevant statistical packages and do some data visualization by themselves.

The students will learn more about the potentials of statistical applications in their future career or everyday life. Hopefully this will draw their interests to the area of statistics.

-Dr. G. Fan"

Thanks very much for your feedback, Tara --Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

-----Original Message-----From: MIUG Consultations [mailto:MIUGconsultations@mi.mun.ca] Sent: Tuesday, November 12, 2019 9:34 AM To: Math Consult <mathconsult@mun.ca> Cc: Derek Howse <Derek.Howse@mi.mun.ca> Subject: RE: Consultation on Calendar Change: STAT 1510

Hello,

We are wondering if students will still be using the statistical software with the removal of the lab component? If not, should the last line of the course description "Statistical software will be used to demonstrate each technique." be removed?

Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University

From:	Math Consult <mathconsult@mun.ca></mathconsult@mun.ca>
Sent:	Thursday, November 14, 2019 11:54 AM
То:	'Zhaozhi'
Subject:	RE: FW: Consultation on Calendar Change: STAT 1510

No problem. Thankyou!! -Tara

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

-----Original Message-----From: Zhaozhi [mailto:zhaozhi@mun.ca] Sent: Thursday, November 14, 2019 11:02 AM To: Math Consult <mathconsult@mun.ca> Subject: Re: FW: Consultation on Calendar Change: STAT 1510

Hi Tara,

I am so sorry for not responding timely--I am still paying the debt I owed during the last month when submitting my NSERC proposal.

Data visualization is a very important part to present statistical results and the course instructor will use statistical software to illustrate statistical techniques.

The instructor will also schedule a few classes taught in a computer lab, and give students a chance to learn some elementary knowledge of relevant statistical packages and do some data visualization by themselves.

The students will learn more about the potentials of statistical applications in their future career or everyday life. Hopefully this will draw their interests to the area of statistics.

Thanks,

George

On 2019-11-12 11:54 a.m., Math Consult wrote: > Hi George, Can you respond to this question about the lab removal of > STAT > 1510 please? > > Thanks,

> Tara

>

- > --> Tara Stuckless
- > HH 3004, ext. 8914
- > 111 3004, EXt. 0914
 > Chain Understand
- > Chair, Undergraduate Studies Committee Dept. of Mathematics and
- > Statistics
- >
- > -----Original Message-----
- > From: MIUG Consultations [mailto:MIUGconsultations@mi.mun.ca]
- > Sent: Tuesday, November 12, 2019 9:34 AM
- > To: Math Consult <mathconsult@mun.ca>
- > Cc: Derek Howse <Derek.Howse@mi.mun.ca>
- > Subject: RE: Consultation on Calendar Change: STAT 1510
- >
- > Hello,
- >
- > We are wondering if students will still be using the statistical
- > software with the removal of the lab component? If not, should the
- > last line of the course description "Statistical software will be used
- > to demonstrate each technique." be removed?
- >
- > Bev
- >
- > Bev Fleet
- > Chair, Undergraduate Studies Committee Marine Institute, Memorial
- > University
- > TEL: 709-778-0369
- > FAX: 709-778-0535
- > Bev.Fleet@mi.mun.ca
- >
- >
- >
- >
- > -----Original Message-----
- > From: Math Consult [mailto:mathconsult@mun.ca]
- > Sent: Friday, November 8, 2019 1:19 PM
- > To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Shannahan,
- > Rachelle <rshannahan@mun.ca>; Collett, Meghan <mcollett@mun.ca>;
- > engrconsult@mun.ca; Rohr, Linda <lerohr@mun.ca>; MIUG Consultations
- > <MIUGconsultations@mi.mun.ca>; deanofmedicine@med.mun.ca; Sutherland,
- > Ian D <isutherland@mun.ca>; DeanNurse <DeanNurse@mun.ca>;
- > pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk
- > <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>
- > Cc: Graham Cox <gcox@mun.ca>
- > Subject: Consultation on Calendar Change: STAT 1510
- >
- > Dear Colleagues,
- >
- > Your feedback on the attached calendar change proposal is appreciated.
- >
- > Summary: Removal of lab hour component to STAT 1510.
- >

8

From:	Rohr, Linda <lerohr@mun.ca></lerohr@mun.ca>
Sent:	Thursday, November 14, 2019 10:45 AM
То:	Math Consult
Subject:	Re: Consultation on Calendar Change: STAT 1510

Hi,

No concerns from HKR with the removal of the lab component of STAT 1510.

Linda

Linda E. Rohr PhD

Dean, School of Human Kinetics & Recreation Memorial University t: 709.864.8129 f: 709.864.7531 e: <u>lerohr@mun.ca</u> PE 2027

From: Math Consult <mathconsult@mun.ca> Date: Friday, November 8, 2019 at 1:19 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>, "ideanofmedicine@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>
Cc: Graham Cox <gcox@mun.ca>
Stati 1510

Dear Colleagues,

Your feedback on the attached calendar change proposal is appreciated.

Summary: Removal of lab hour component to STAT 1510.

Comments may be sent to <u>mathconsult@mun.ca</u>.

Regards, Tara

Undergraduate Studies Committee Dept. of Mathematics and Statistics

From:Davis,Erin <emdavis@mun.ca>Sent:Wednesday, November 13, 2019 8:42 AMTo:mathconsult@mun.caSubject:FW: Consultation on Calendar Change: STAT 1510Attachments:Senate_Summary_Stats1510.pdf

Hi Tara,

Pharmacy has no concerns with the proposed changes.

Erin ---

Erin Davis, PharmD Associate Dean Undergraduate Studies Associate Professor Memorial University School of Pharmacy T 709 864 8815 E emdavis@mun.ca

From:	Math Consult <mathconsult@mun.ca></mathconsult@mun.ca>
Sent:	Tuesday, November 12, 2019 11:55 AM
То:	George Fan
Subject:	FW: Consultation on Calendar Change: STAT 1510

Hi George, Can you respond to this question about the lab removal of STAT 1510 please?

Thanks, Tara

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

-----Original Message-----From: MIUG Consultations [mailto:MIUGconsultations@mi.mun.ca] Sent: Tuesday, November 12, 2019 9:34 AM To: Math Consult <mathconsult@mun.ca> Cc: Derek Howse <Derek.Howse@mi.mun.ca> Subject: RE: Consultation on Calendar Change: STAT 1510

Hello,

We are wondering if students will still be using the statistical software with the removal of the lab component? If not, should the last line of the course description "Statistical software will be used to demonstrate each technique." be removed?

Bev

Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

-----Original Message-----

From: Math Consult [mailto:mathconsult@mun.ca] Sent: Friday, November 8, 2019 1:19 PM To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Shannahan, Rachelle <rshannahan@mun.ca>; Collett, Meghan <mcollett@mun.ca>; engrconsult@mun.ca; Rohr, Linda <lerohr@mun.ca>; MIUG Consultations <MIUGconsultations@mi.mun.ca>; deanofmedicine@med.mun.ca; Sutherland, Ian D <isutherland@mun.ca>;

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:

- \Box New course(s):
- ✓ Amended or deleted course(s): Several OCSC courses
- □ 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

OCSC 1000 Exploration of the World Ocean OCSC 4000 Scientific Diving Methods OCSC 4100 Marine Pelagic Food Webs OCSC 4122 Advanced Studies in Marine Animal Diversity

RATIONALE

Minor changes are proposed to existing course descriptions and/or prerequisites to provide greater clarity and consistency for students and advisors.

- (1) The description of OCSC 1000 is adjusted to reflect the new online section that is now being offered.
- (2) The prerequisites and description of OCSC 4000 are adjusted to make it more accessible and to update the delivery site. To achieve several course's learning objectives, students enrolled in OCSC 4000 must design and execute a small research project focusing on key biological and ecological aspects of marine organisms. Most students naturally chose to study benthic invertebrates, in part because they are easily and safely accessible and relatively easy to study underwater. To expedite the learning process, students joining OCSC 4000 are expected to have at least a basic understanding of the biology and ecology of dominant marine invertebrates. With dedicated modules on the biology and ecology of marine invertebrates, OCSC 2000's revised structure and content adequately prepares students for OCSC 4000. The proposed simplification of the prerequisites structure will facilitate student access to OCSC 4000, while helping the Department of Ocean Sciences best deliver/subscribe its growing ocean/marine programs and accept students from other academic units with relevant background (BIOL 2122 and BIOL 2600; or BIOL 3709; or BIOL 3710; or BIOL 3711; or ENVS 2371). OCSC 4000 has not been offered at the Bonne Bay Marine Station yet. Successful delivery at the OSC indicates that teaching the course in the St. John's area is a suitable and effective approach, at least under current and expected budgetary landscape.
- (3) OCSC 4100 is removed because it is no longer being offered.
- (4) Minor adjustments to the prerequisites of OCSC 4122 are proposed to reflect a common substitution that has worked well.

CALENDAR CHANGES

12.9 Ocean Sciences

Ocean Sciences courses are designated by OCSC.

1000 Exploration of the World Ocean is an introductory course covering the major ocean sciences (biology, chemistry, geology, physics) at a level sufficient for science majors but accessible to non-science majors. It explores phenomena occurring from the shoreline to the abyss and from equatorial to polar regions. It also examines principles of marine ecology as well as how the marine environment affects humans and vice versa. The course is offered <u>either</u> in a blended format <u>(that combines combining</u> face-to-face lectures and online interactive activities in the form of virtual oceanographic expeditions) or exclusively online.

LC: Up to 1.5 hours per week

OR: <u>1.5Up to 3</u> hours per week of (online interactive activities)

2000 Introductory Biological Oceanography provides a general understanding of the biological processes that occur in coastal and oceanic environments. It introduces students to the major groups of bacteria, phytoplankton, invertebrates and fish, emphasizing the biotic and abiotic factors controlling primary production and marine biomass. It shows how the physical, chemical, and geological environments interact with biology to define processes and patterns affecting nutrients and life in marine ecosystems.

CR: Biology 3710

PR: OCSC 1000 and a 1000-level course in one of Biology, Chemistry, Earth Sciences or Physics

2001 Introduction to Sustainable Fisheries and Aquaculture introduces students to the breadth of aquaculture and fisheries science and the variety of animal species cultured and harvested. Basic aspects of aquaculture and fisheries and the links between the two are covered, including production systems, capture fisheries, environmental interactions, and the physiology, ecology and reproduction of finfish and shellfish in the context of their culture and harvest. PR: OCSC 1000 or Biology 1002

2100 Introductory Chemical Oceanography (same as Chemistry 2610) provides an introduction to the fundamental chemical properties of seawater and the processes governing the concentrations of elements and compounds in the oceans. It is an introduction to the sources, distribution, and transformations of chemical constituents of the ocean, and their relation to biological, chemical, geological, and physical processes. Topics include: controls on average concentration of chemicals in the ocean; vertical and horizontal distributions of ocean constituents; air-sea interactions; production, export, and remineralization of organic matter; the ocean carbon cycle; human-induced changes; stable isotopes; and trace elements.

CR: Chemistry 2610

PR: the former CHEM 1011 or 1051 or 1001 which may be taken concurrently

2200 Introductory Geological Oceanography (same as Earth Sciences 2919) is a study of the formation and evolution of oceans, including plate tectonics, mid-ocean ridges (birth place of oceans), subduction zones (where oceans are consumed), sedimentary environments such as estuaries, deltas, beaches and barrier islands,

continental shelves, slopes and deep abyssal plains and special topics, including anoxic events, evolution of tides, atmosphere-ocean interactions, formation of banded iron formations, snowball Earth, black and white smokers, and how Earth modulates its climate through atmosphere, hydrosphere, biosphere and lithosphere interactions. CR: Earth Sciences 2919

PR: Earth Sciences 1000 with a grade of at least 55%

2300 Introductory Physical Oceanography (same as Physics 2300) provides an introduction to general oceanography with a primary focus on physical oceanography. Topics include how oceans form and evolve on a planetary scale. Ocean characteristics studied include: the properties of seawater; elementary dynamics of fluids on the rotating Earth; ocean circulation; wind-forcing in the ocean; tides and waves. Contemporary methods used in oceanographic study are covered including satellite oceanography. Interactions that occur between physical and chemical processes and biological activity are reviewed.

CR: Environmental Science 2371, Physics 2300

PR: 6 credit hours in any first-year courses in Physics

2500 Introduction to Practical Ocean Sciences explores the instruments, techniques and analytical methods commonly used to study marine life and processes, chiefly focusing on the interaction between living organisms and their chemical, physical and geological environment. The course combines ship-based or shore-based sampling and data collection with laboratory investigation in an intensive 2-week long format. It is primarily intended for mid-level undergraduate students majoring in Ocean Sciences or Marine Biology. This course will either be offered during a special session following the Winter semester, or in the Spring semester.

AR: attendance is required. Failure to attend may result in a failing grade or withdrawal from the course.

PR: Science 1807 and Science 1808; OCSC 1000, and at least three of OCSC 2000 (or Biology 3710), 2001, 2100, 2200, 2300

3000 Aquaculture Principles and Practices emphasizes the techniques and methods used to culture finfish and shellfish, with a primary focus on Canadian aquaculture species. Basic aspects of aquaculture will be covered, including the design and maintenance of production systems, culture techniques, and the nutrition, health, physiology and reproduction of finfish and shellfish. The laboratory portion of this course will provide students with practical experience in the maintenance of land-based aquaculture production systems and in the husbandry/culture of aquatic organisms. LH: 3

PR: OCSC 2001, or OCSC 1000 and Biology 1002

3002 Aquaculture and Fisheries Biotechnology is an introduction to biotechnology and genetics as they are applied to aquaculture and fisheries. Topics covered include genetic variation; genetic structure of fish and shellfish populations; the genetic basis of aquaculture traits; finfish and shellfish genomic research; marker-assisted selection in aquaculture; manipulation of ploidy; genetic engineering in aquaculture; and techniques used to study the responses of aquatic animals to external stressors such as hypoxia, temperature stress, acidification, and pathogens. PR: Biology 2250 or Biochemistry 2100

3600 Marine Microbiology provides an overview of microbial activity in the ocean, both in natural and applied settings. The focus is on interactions between microorganisms and other biota, ranging from deep-sea vent invertebrates to commercially cultured fish species. Prospective topics include effluent discharge, water quality, bacterial metabolism and nutrient cycles, bacteria-virus and bacteria-host interactions (including symbioses and pathogenesis), and marine microbial biotechnology. PR: Biology 2250 or Biochemistry 2100

3640 Environmental Physiology of Animals (same as Biology 3640) covers physiological adaptations of animals facilitating their survival in natural environments with emphasis on physiological and biochemical responses of animals to extreme environments. Starting with the fundamental basis of physiological mechanisms, the course explores various aspects and the integration of major physiological processes (metabolism, respiration, osmoregulation) and how these relate to ecological niche. CR: the former Biology 3403 or the former Biology 4455, Biology 3640

PR: Biology 2060; Biochemistry 3106 or 3206

UL: may not be used to fulfill the physiology course requirement for a Biology major, honours or joint honours program

4000 Scientific Diving Methods is an in-depth study and application of methods routinely employed for data collection in underwater scientific research. Aspects covered include habitat mapping; installation and use of instrumentation; still and video camera techniques; planning and execution of surveys and experiments in major subtidal habitats; as well as data analysis and interpretation. Participants are trained in accordance with Memorial University of Newfoundland's Guide for Diving Safety and the Canadian Association for Underwater Science (CAUS) standards to meet the criteria for Scientific Diver I rating. This course is normally offered at the Bonne Bay Marine Station Ocean Sciences Centre in a special 2-week session at the beginning or end of the Spring semester-depending on station's availability.

OR: The following documentation must be provided to the course instructor at least four months before the first day of the course. It must be in effect until at least the last day of the course. Submission of this documentation does not guarantee acceptance into the course. Aside from course prerequisites, acceptance will be based on successful completion, before the course begins, of a diving fitness and skills evaluation in a pool environment and demonstration of understanding of the MUN Diving Safety Manual, physics and physiology of diving, and use of recreational dive tables. Nationally recognized scuba diver certification with diver rescue and accident management techniques; diver medical examination by a licensed physician knowledgeable in diving medicine; First Aid (basic), CPR (basic), and DAN oxygen first aid for scuba diving injuries administration cards; DAN membership and insurance or medical insurance covering hyperbaric treatment; diver's log book with at least 12 dives in the last 12 months including one dive in the last six months and four dives in cold (<10°C) water; cold-water scuba

diving equipment complete with proper hydrostatic/VIP service tags on diving cylinders and overhaul/service receipts on regulators and buoyancy compensator devices. PR: Biology 2122 or Biology 3709, Biology 2600 or OCSC 2000 (or Biology 2122 and 2600; or Biology 3709; or Biology 3710; or Biology 3711; or Environmental Science 2371,): Statistics 2550 or equivalent

4100 Marine Pelagic Food Webs examines the structure, function and dynamics of pelagic food webs in the marine environment. The course will focus on the material and energy flows within and among trophic levels and the interactions with major biogeochemical cycles and climate.

PR: Biology 1002 or 2120, and OCSC 2000 or Biology 3710

4122 Advanced Studies in Marine Animal Diversity (same as Biology 4122) provides an in-depth examination of cellular, physiological, behavioural and ecological adaptations in marine animals. Lectures will be combined with discussions of relevant papers from the primary literature on topics of current interest which may relate morphology, ecology, evolution, natural history, species interactions and practical applications. Students will also gain hands-on experience by designing and conducting research projects involving live or preserved animals.

CR: Biology 4122

LC: either three hours of lecture and three hours of laboratory per week or a two-week intensive course that embodies equivalent instructional time

LH: either three hours of lecture and three hours of laboratory per week or a two-week intensive course that embodies equivalent instructional time

PR: Science 1807 and Science 1808; OCSC 2000 and 2500 (or Biology 2122), and Biology 2600

4200 Marine Omics provides an overview of marine genomics, transcriptomics, proteomics, glycomics, metabolomics, and lipidomics. Omics-based studies of a variety of marine organisms (e.g. fungi, algae, animals), as well as several industrial applications (e.g. biofuel, nutrigenomics, pharmacogenomics, aquaculture and fisheries), will be considered.

PR: OCSC 1000 and Biology 2250 (or Biochemistry 2100), or OCSC 3002

4300 Climate Change and Global Marine Fisheries Dynamics explores the effects of ocean-atmosphere dynamics on large scale marine ecosystem domains, with a special focus on assessing the impact of anticipated climate change on global fisheries production. The course uses a blend of lectures and computer simulation laboratories to familiarize students with current research on fisheries and climate change. LH: 3

PR: OCSC 1000, 2000 (or Biology 3710) and 2001

4400 Deep-Sea Ecology provides an overview of the physical and chemical environment of the deep sea, including hydrothermal vents and seeps, to explore adaptations in deep-sea organisms and biodiversity in this key oceanic system. The course combines lectures, seminars, discussions and computer-based laboratory tools, such as dive logs from remotely operated vehicles and data from underwater cabled observatories. It introduces students to emerging research, cutting-edge technologies, as well as natural and human impacts in the deep sea. LH: 3

PR: OCSC 2500 and at least one course in Ocean Sciences at the 3000 or 4000 level

4601 Functional Biology of Fish (same as Biology 4601) is an introduction to anatomical, physiological and cellular processes in the life cycle of fishes. CR: Biology 4601 PR: Biology 2060, Biology 2210 or 3202, and Biology 3401 or 3640

4910-4919 Special Topics in Ocean Biogeochemistry are advanced courses for senior undergraduate students that cover one or several subjects related to environmental changes and the flow of major elements in marine systems. PR: to be determined at the time of offer

4920-4929 Special Topics in Marine Ecology are advanced courses for senior undergraduate students that cover one or several subjects related to evolutionary and ecological principles at the organisimal and ecosystem levels in marine systems. PR: to be determined at the time of offer

4930-4939 Special Topics in Experimental Marine Biology are advanced courses for senior undergraduate students that cover one or several subjects related to research in marine biology, such as field and laboratory experimental design, data analysis and modeling.

PR: to be determined at the time of offer

4940-4949 Special Topics in Applied Ocean Sciences are advanced courses for senior undergraduate students that cover one or several subjects of special interest in applied fields of ocean sciences, such as fisheries, conservation, aquaculture, and biotechnology.

PR: to be determined at the time of offer

499A/B Honours Dissertation is a two-semester linked course based on independent research conducted under the supervision of an academic supervisor, who is normally a faculty member of the Department of Ocean Sciences. This dissertation is mandatory for students pursuing the Honours in Ocean Sciences. It can also be used towards the requirements of the Joint Honours in Marine Biology. A grade of PAS in 499A is required to proceed to 499B. The final written dissertation is normally submitted before the end of the tenth week of the second semester and an oral presentation of the completed research is delivered before the end of the semester. CH: 6

PR: Honours students in their final year or permission of the Head of the Department; Science 1807 and Science 1808

CALENDAR ENTRY AFTER CHANGES

12.9 Ocean Sciences

Ocean Sciences courses are designated by OCSC.

1000 Exploration of the World Ocean is an introductory course covering the major ocean sciences (biology, chemistry, geology, physics) at a level sufficient for science majors but accessible to non-science majors. It explores phenomena occurring from the shoreline to the abyss and from equatorial to polar regions. It also examines principles of marine ecology as well as how the marine environment affects humans and vice versa. The course is offered either in a blended format (combining face-to-face lectures and online interactive activities in the form of virtual oceanographic expeditions) or exclusively online.

LC: Up to 1.5 hours per week

OR: Up to 3 hours per week of online interactive activities

2000 Introductory Biological Oceanography provides a general understanding of the biological processes that occur in coastal and oceanic environments. It introduces students to the major groups of bacteria, phytoplankton, invertebrates and fish, emphasizing the biotic and abiotic factors controlling primary production and marine biomass. It shows how the physical, chemical, and geological environments interact with biology to define processes and patterns affecting nutrients and life in marine ecosystems.

CR: Biology 3710 PR: OCSC 1000 and a 1000-level course in one of Biology, Chemistry, Earth Sciences or Physics

2001 Introduction to Sustainable Fisheries and Aquaculture introduces students to the breadth of aquaculture and fisheries science and the variety of animal species cultured and harvested. Basic aspects of aquaculture and fisheries and the links between the two are covered, including production systems, capture fisheries, environmental interactions, and the physiology, ecology and reproduction of finfish and shellfish in the context of their culture and harvest.

PR: OCSC 1000 or Biology 1002

2100 Introductory Chemical Oceanography (same as Chemistry 2610) provides an introduction to the fundamental chemical properties of seawater and the processes governing the concentrations of elements and compounds in the oceans. It is an introduction to the sources, distribution, and transformations of chemical constituents of the ocean, and their relation to biological, chemical, geological, and physical processes. Topics include: controls on average concentration of chemicals in the ocean; vertical and horizontal distributions of ocean constituents; air-sea interactions; production, export, and remineralization of organic matter; the ocean carbon cycle; human-induced changes; stable isotopes; and trace elements.

CR: Chemistry 2610

PR: the former CHEM 1011 or 1051 or 1001 which may be taken concurrently

2200 Introductory Geological Oceanography (same as Earth Sciences 2919) is a study of the formation and evolution of oceans, including plate tectonics, mid-ocean ridges (birth place of oceans), subduction zones (where oceans are consumed), sedimentary environments such as estuaries, deltas, beaches and barrier islands, continental shelves, slopes and deep abyssal plains and special topics, including anoxic events, evolution of tides, atmosphere-ocean interactions, formation of banded iron formations, snowball Earth, black and white smokers, and how Earth modulates its climate through atmosphere, hydrosphere, biosphere and lithosphere interactions. CR: Earth Sciences 2919

PR: Earth Sciences 1000 with a grade of at least 55%

2300 Introductory Physical Oceanography (same as Physics 2300) provides an introduction to general oceanography with a primary focus on physical oceanography. Topics include how oceans form and evolve on a planetary scale. Ocean characteristics studied include: the properties of seawater; elementary dynamics of fluids on the rotating Earth; ocean circulation; wind-forcing in the ocean; tides and waves. Contemporary methods used in oceanographic study are covered including satellite oceanography. Interactions that occur between physical and chemical processes and biological activity are reviewed.

CR: Environmental Science 2371, Physics 2300

PR: 6 credit hours in any first-year courses in Physics

2500 Introduction to Practical Ocean Sciences explores the instruments, techniques and analytical methods commonly used to study marine life and processes, chiefly focusing on the interaction between living organisms and their chemical, physical and geological environment. The course combines ship-based or shore-based sampling and data collection with laboratory investigation in an intensive 2-week long format. It is primarily intended for mid-level undergraduate students majoring in Ocean Sciences or Marine Biology. This course will either be offered during a special session following the Winter semester, or in the Spring semester.

AR: attendance is required. Failure to attend may result in a failing grade or withdrawal from the course.

PR: Science 1807 and Science 1808; OCSC 1000, and at least three of OCSC 2000 (or Biology 3710), 2001, 2100, 2200, 2300

3000 Aquaculture Principles and Practices emphasizes the techniques and methods used to culture finfish and shellfish, with a primary focus on Canadian aquaculture species. Basic aspects of aquaculture will be covered, including the design and maintenance of production systems, culture techniques, and the nutrition, health, physiology and reproduction of finfish and shellfish. The laboratory portion of this course will provide students with practical experience in the maintenance of land-based aquaculture production systems and in the husbandry/culture of aquatic organisms. LH: 3

PR: OCSC 2001, or OCSC 1000 and Biology 1002

3002 Aquaculture and Fisheries Biotechnology is an introduction to biotechnology and genetics as they are applied to aquaculture and fisheries. Topics covered include genetic variation; genetic structure of fish and shellfish populations; the genetic basis of aquaculture traits; finfish and shellfish genomic research; marker-assisted selection in aquaculture; manipulation of ploidy; genetic engineering in aquaculture; and techniques used to study the responses of aquatic animals to external stressors such as hypoxia, temperature stress, acidification, and pathogens.

PR: Biology 2250 or Biochemistry 2100

3600 Marine Microbiology provides an overview of microbial activity in the ocean, both in natural and applied settings. The focus is on interactions between microorganisms and other biota, ranging from deep-sea vent invertebrates to commercially cultured fish species. Prospective topics include effluent discharge, water quality, bacterial metabolism and nutrient cycles, bacteria-virus and bacteria-host interactions (including symbioses and pathogenesis), and marine microbial biotechnology. PR: Biology 2250 or Biochemistry 2100

3640 Environmental Physiology of Animals (same as Biology 3640) covers physiological adaptations of animals facilitating their survival in natural environments with emphasis on physiological and biochemical responses of animals to extreme environments. Starting with the fundamental basis of physiological mechanisms, the course explores various aspects and the integration of major physiological processes (metabolism, respiration, osmoregulation) and how these relate to ecological niche. CR: the former Biology 3403 or the former Biology 4455, Biology 3640

PR: Biology 2060; Biochemistry 3106 or 3206

UL: may not be used to fulfill the physiology course requirement for a Biology major, honours or joint honours program

4000 Scientific Diving Methods is an in-depth study and application of methods routinely employed for data collection in underwater scientific research. Aspects covered include habitat mapping; installation and use of instrumentation; still and video camera techniques; planning and execution of surveys and experiments in major subtidal habitats; as well as data analysis and interpretation. Participants are trained in accordance with Memorial University of Newfoundland's Guide for Diving Safety and the Canadian Association for Underwater Science (CAUS) standards to meet the criteria for Scientific Diver I rating. This course is normally offered at the Ocean Sciences Centre in a special 2-week session at the beginning or end of the Spring semester.

OR: The following documentation must be provided to the course instructor at least four months before the first day of the course. It must be in effect until at least the last day of the course. Submission of this documentation does not guarantee acceptance into the course. Aside from course prerequisites, acceptance will be based on successful completion, before the course begins, of a diving fitness and skills evaluation in a pool environment and demonstration of understanding of the MUN Diving Safety Manual, physics and physiology of diving, and use of recreational dive tables. Nationally recognized scuba diver certification with diver rescue and accident management

techniques; diver medical examination by a licensed physician knowledgeable in diving medicine; First Aid (basic), CPR (basic), and DAN oxygen first aid for scuba diving injuries administration cards; DAN membership and insurance or medical insurance covering hyperbaric treatment; diver's log book with at least 12 dives in the last 12 months including one dive in the last six months and four dives in cold (<10°C) water; cold-water scuba diving equipment complete with proper hydrostatic/VIP service tags on diving cylinders and overhaul/service receipts on regulators and buoyancy compensator devices. PR: OCSC 2000 (or Biology 2122 and 2600; or Biology 3709; or Biology 3710; or Biology 3711; or Environmental Science 2371); Statistics 2550 or equivalent

4122 Advanced Studies in Marine Animal Diversity (same as Biology 4122) provides an in-depth examination of cellular, physiological, behavioural and ecological adaptations in marine animals. Lectures will be combined with discussions of relevant papers from the primary literature on topics of current interest which may relate morphology, ecology, evolution, natural history, species interactions and practical applications. Students will also gain hands-on experience by designing and conducting research projects involving live or preserved animals.

CR: Biology 4122

LC: either three hours of lecture and three hours of laboratory per week or a two-week intensive course that embodies equivalent instructional time

LH: either three hours of lecture and three hours of laboratory per week or a two-week intensive course that embodies equivalent instructional time

PR: Science 1807 and Science 1808; OCSC 2000 and 2500 (or Biology 2122), and Biology 2600

4200 Marine Omics provides an overview of marine genomics, transcriptomics, proteomics, glycomics, metabolomics, and lipidomics. Omics-based studies of a variety of marine organisms (e.g. fungi, algae, animals), as well as several industrial applications (e.g. biofuel, nutrigenomics, pharmacogenomics, aquaculture and fisheries), will be considered.

PR: OCSC 1000 and Biology 2250 (or Biochemistry 2100), or OCSC 3002

4300 Climate Change and Global Marine Fisheries Dynamics explores the effects of ocean-atmosphere dynamics on large scale marine ecosystem domains, with a special focus on assessing the impact of anticipated climate change on global fisheries production. The course uses a blend of lectures and computer simulation laboratories to familiarize students with current research on fisheries and climate change. LH: 3

PR: OCSC 1000, 2000 (or Biology 3710) and 2001

4400 Deep-Sea Ecology provides an overview of the physical and chemical environment of the deep sea, including hydrothermal vents and seeps, to explore adaptations in deep-sea organisms and biodiversity in this key oceanic system. The course combines lectures, seminars, discussions and computer-based laboratory tools, such as dive logs from remotely operated vehicles and data from underwater cabled observatories. It introduces students to emerging research, cutting-edge technologies, as well as natural and human impacts in the deep sea. LH: 3

PR: OCSC 2500 and at least one course in Ocean Sciences at the 3000 or 4000 level

4601 Functional Biology of Fish (same as Biology 4601) is an introduction to anatomical, physiological and cellular processes in the life cycle of fishes. CR: Biology 4601 PR: Biology 2060, Biology 2210 or 3202, and Biology 3401 or 3640

4910-4919 Special Topics in Ocean Biogeochemistry are advanced courses for senior undergraduate students that cover one or several subjects related to environmental changes and the flow of major elements in marine systems. PR: to be determined at the time of offer

4920-4929 Special Topics in Marine Ecology are advanced courses for senior undergraduate students that cover one or several subjects related to evolutionary and ecological principles at the organisimal and ecosystem levels in marine systems. PR: to be determined at the time of offer

4930-4939 Special Topics in Experimental Marine Biology are advanced courses for senior undergraduate students that cover one or several subjects related to research in marine biology, such as field and laboratory experimental design, data analysis and modeling.

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PR: Honours students in their final year or permission of the Head of the Department; Science 1807 and Science 1808
Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

From	Response Received
Grenfell campus	No
Faculty of Business Administration	No
Faculty of Education	No
Faculty of Engineering & Applied Science	Yes
Faculty of Humanities & Social Science	No
Faculty of Science	Yes
Department of Biochemistry	
Department of Biology	Х
Department of Chemistry	
Department of Computer Sciences	
Department of Earth Sciences	
Department of Economics	
Department of Geography	Х
Department of Mathematics and Statistics	
Department of Physics and Physical Oceanography	Х
Department of Psychology	Х
Marine Institute	Yes
School of Medicine	Yes

The request for feedback and responses received are provided in the Appendix.

See Appendix

RESOURCE IMPLICATIONS NA

APPENDIX – CONSULTATIONS

Message Sent

From: "Fletcher, Garth" <<u>fletcher@mun.ca</u>> Date: Thursday. October 17, 2019 at 1:13 PM **To:** "Associate Dean of Science (Undergraduate)" <a dsu@mun.ca>, BiocDHundergrad <biocdhundergrad@mun.ca>, Business <fba.ad.undergrad@mun.ca>, "chemconsult@mun. ca (chemconsult@mun.ca)" <chemconsult@mun.ca>, "'cschair@mun.ca'" <cs-chair@mun.ca>, Earth Sciences <eascugcon@mun.ca>, "Locke, Wade" <<u>wlocke@mun.ca</u>>, "Hicks, Sue" <<u>shicks@mun.ca</u>>, Engineering <engrconsult@mun.ca>, Erin <ekalcock@mun.ca>, Grenfell Campus <associatevpoffice@grenfell.mun.ca>, Faculty of Humanities and Social Sciences <hss@mun.ca>, "'mathconsult@mun.ca'" <mathconsult@mun.ca>, Medicine <deanofmedicine@med.mun.ca>, "'miugconsultations@mi.mun.ca'" <mugconsultations@mi.mun.ca>, "Catto, Norm" <ncatto@mun.ca>, Physics Head <physicshead@mun.ca>, "psychology.head@mun.ca" <psychology.head@mun.ca>, Suzanne Dufour <sdufour@mun.ca>, "Chapman, Tom" <tomc@mun.ca> Cc: "amercier@mun.ca" <amercier@mun.ca> Subject: Proposals for Calendar Changes

Colleagues, I have attached two proposals for calendar changes:

- 1. A proposal to make minor housekeeping changes to our academic program descriptions.
- A proposal for adjusting the prerequisites and descriptions of three courses (OCSC 1000, 4000, and 4122) as well as removing OCSC 4100 from our course offerings.

Could I have your feedback by November 6 please.

Regards

Garth

Garth L. Fletcher Head and Professor Emeritus Department of Ocean Sciences Ocean Sciences Centre Memorial University St John's NL Canada, A1C 5S7 TEL: 709-864-3276 FAX 709-864-3220 Email <u>fletcher@mun.ca</u>

Feedback Received

From: Catto, Norm Sent: October-17-19 2:00 PM

To: Fletcher, Garth <fletcher@mun.ca>; Associate Dean of Science (Undergraduate) <adsu@mun.ca>; BiocDHundergrad <biocdhundergrad@mun.ca>; Business <fba.ad.undergrad@mun.ca>; chemconsult@mun. ca (chemconsult@mun.ca) <chemconsult@mun.ca>; 'cs-chair@mun.ca' <cs-chair@mun.ca>; Earth Sciences <eascugcon@mun.ca>; Locke, Wade <wlocke@mun.ca>; Hicks, Sue <shicks@mun.ca>; Engineering <engrconsult@mun.ca>; Alcock, Erin <ekalcock@mun.ca>; Grenfell Campus <associatevpoffice@grenfell.mun.ca>; Faculty of Humanities and Social Sciences <hss@mun.ca>; 'mathconsult@mun.ca' <mathconsult@mun.ca>; Medicine <deanofmedicine@med.mun.ca>; 'miugconsultations@mi.mun.ca' <miugconsultations@mi.mun.ca>; Physics Head <physicshead@mun.ca>; psychology.head@mun.ca; Suzanne Dufour <sdufour@mun.ca>; Chapman, Tom <tomc@mun.ca> Cc: amercier@mun.ca Subject: RE: Proposals for Calendar Changes

"Senior course" isn't defined formally ... it should read "3000-level or above" (e.g.)

Norm Catto Head, Department of Geography Memorial University St. John's NL A1B 3X9 Canada 1-709-864-7463 Fax 1-709-864-3119

From: Head Psychology Sent: October-18-19 10:10 AM To: Fletcher, Garth <fletcher@mun.ca> Subject: RE: Proposals for Calendar Changes

Hi Garth,

These look fine to me...

Cheers,

Ken

From: cvardy@mun.ca [mailto:cvardy@mun.ca]
Sent: October-17-19 3:14 PM
To: Fletcher, Garth <fletcher@mun.ca>
Cc: Margaret.Steele@med.mun.ca
Subject: FW: Proposals for Calendar Changes

Good Day

We have reviewed your two proposals for calendar changes and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

T 709 864 6417 | F 709 864 6336

From: Physics Head Sent: October 22, 2019 4:42 PM To: Fletcher, Garth <fletcher@mun.ca>; jmunroe@mun.ca Subject: Re: Proposals for Calendar Changes

Hi Garth,

Based on feedback here, those changes all look very minor yet reasonable.

Kris

From: Engineering Consult [mailto:engrconsult@mun.ca]
Sent: October-23-19 3:08 PM
To: Fletcher, Garth <fletcher@mun.ca>
Cc: Edmunds, Jayde <edmundsj@mun.ca>; Peters, Dennis <dpeters@mun.ca>; Bruce
Quinton <bruce.quinton@mun.ca>
Subject: Re: Proposals for Calendar Changes

Dear Dr. Fletcher,

Thank you for the opportunity to comment on the Calendar change documents for various program regulations in Ocean Sciences.

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.

Our only comment is the same as one offered by Dr. Catto (Geography) on Oct. 17.

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

From: Suzanne Dufour [mailto:sdufour@mun.ca]
Sent: October-31-19 11:43 AM
To: Fletcher, Garth <fletcher@mun.ca>; jodyb@mun.ca
Subject: Fwd: Proposals for Calendar Changes

Good morning Garth,

The Biology Undergraduate Studies Committee has reviewed the proposed changes to OCSC program descriptions and courses. While we have no concerns with those changes, we would like to specify that we will not be changing the prerequisites to BIOL 4122 (same as OCSC 4122) to correspond with the proposed changes to OCSC 4122 prerequisites. We are of the opinion that a 4th year Biology course on Advanced Studies of Marine Animals should have as a prerequisite a full-semester course on invertebrate zoology (BIOL 2122) that includes a lab, as it will more adequately prepare students for in-depth examination and hands-on experimentation with marine animals (especially since most marine animals are invertebrates). Based on its course description, the proposed alternative, OCSC 2000 Introductory Biological Oceanography, includes an "introduction to major groups of ... invertebrates and fish" but does not cover marine invertebrate diversity, anatomy, and form-function relationships in as much detail as BIOL 2122, and does not have a lab. We therefore do not consider OCSC 2000 and BIOL 2122 as interchangeable prerequisites for BIOL 4122. Best wishes.

Suzanne

--Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

On 11-Nov.-2019 10:08 a.m., Annie Mercier wrote:

Dear Suzanne:

We thank you and the Biology Undergraduate Studies Committee for your input. We have discussed this internally and also sought counsel regarding the possibility of listing different prerequisites for the two sections of OCSC/BIOL 4122. However, the prerequisites must be uniform, and as the department of record we have a responsibility to make sure the course is accessible to all students who can benefit from it. Nevertheless, to address your comment about lab/hands on experience, we will modify the prerequisites to "...OCSC 2000 and 2500 (or Biology 2122)...".

All the best,

Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php

From: MIUG Consultations [mailto:MIUGconsultations@mi.mun.ca]
Sent: November 4, 2019 1:56 PM
To: Fletcher, Garth <fletcher@mun.ca>
Subject: RE: Proposals for Calendar Changes

Hi Garth,

Thank you for the opportunity to review and comment on these two proposals. We are happy to support them.

Regards, Bev Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

From: Alcock, Erin
Sent: Friday, November 8, 2019 2:57 PM
To: Fletcher, Garth <fletcher@mun.ca>
Subject: Re: Proposals for Calendar Changes

Dr. Fletcher,

I have reviewed all of the calendar changes and see no items that will be of concern to the Library.

Best,

Erin Alcock

Erin Alcock Science Research Liaison Librarian QEII Library : Memorial University of Newfoundland : 709-864-8316

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:

- \Box New course(s):
- \Box Amended or deleted course(s):
- □ New program(s):
- ✓ Amended or deleted program(s): Several programs in Ocean Sciences
- □ 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 Programs

PROGRAM TITLES

BSc with Minor in Sustainable Aquaculture and Fisheries Ecology BSc with Major in Ocean Sciences BSc with Major in Ocean Sciences (Environmental Systems) BSc with Honours in Ocean Sciences

RATIONALE

Minor housekeeping changes to the program descriptions are proposed to provide greater clarity and consistency for students and advisors. We wish to update the language, remove some unnecessary text, and adjust the list of eligible courses in the Minors and Majors to reflect current offerings. Where no specific courses are required, we wish to remove this list entirely to avoid confusion. We also propose to add Ocean Sciences among the list of subjects eligible for the minimum number of senior courses in the Honours.

CALENDAR CHANGES (under Section 11.9 Ocean Sciences)

No changes in sections 11.9 and 11.9.1

11.9.2 Minor in Sustainable Aquaculture and Fisheries Ecology

Students who take a Minor in Sustainable Aquaculture and Fisheries Ecology will complete 24 credit hours as follows:

- 1. Ocean Sciences 1000, 2001, 3000, 3002, 4300;
- six credit hours selected from: Ocean Sciences 2000 (or Biology 3710), 3600, 3640, 4000, 4100, 4122, 4200, 4601, or other applicable courses <u>at the 3000 level or above</u>, as approved by the Head of the Department or delegate;
- 3. three credit hours selected from:
 - a. Biology 2122, 3401, 3640, 3715, 4251, 4605, 4750;
 - b. Biochemistry 3107, 3402, 4002, 4101, 4104, 4105, 4200, 4201;
 - c. Geography 4300.

Course prerequisites stipulated in the Course Descriptions shall apply to the Minor in Sustainable Aquaculture and Fisheries Ecology.

No changes in sections 11.9.3 and 11.9.3.1

11.9.3.2 Program Regulations for the Major in Ocean Sciences

Students must successfully complete:

- 1. the 30 specified credit hours required under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems);
- Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550(or equivalent);
- 3. Physics 1021 or 1051;
- 4. a minimum of 30 credit hours in Ocean Sciences, including:
 - a. Ocean Sciences 2000 (or Biology 3710), 2001, 2100 and 2500. Ocean Sciences 1000, completed under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems), will count as 3 of the required 30 credit hours in Ocean Sciences;
 - b. at least one of Ocean Sciences 2200 or 2300; and
 - c. at least 9 credit hours in Ocean Sciences courses at the 3000 and/or 4000 level. Choices include but are not limited to Ocean Sciences 3000, 3002, 3600, 3640, 4000, 4100, 4122, 4200, 4300, 4601;
- extra Science courses as necessary to fulfil the minimum requirement for 78 credit hours in Science as stipulated under Electives of the Degree Regulations for the General Degree of Bachelor of Science. The program should include a minimum of 15 credit hours in Science courses at the 3000 and/or 4000 level; and
- 6. elective courses as necessary to make up the total of 120 credit hours.

11.9.3.3 Program Regulations for the Major in Ocean Sciences (Environmental Systems)

Students must successfully complete:

- 1. the 30 credit hours required under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems);
- 2. Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550(or equivalent);
- 3. Physics 1021 or 1051;
- 4. Geography 1050, and at least two of Geography 2102, 2195, or 2425;
- 5. Earth Sciences 1002, 2502;
- 6. at least 9 credit hours at the 3000 and/or 4000 level chosen from:
 - a. Geography 3120, 3140, 3250, 3425, 3510, 3905, the former 3907, 4250, 4908, 4917; and
 - b. Earth Sciences 3600, 4605, 4903.
- 7. a minimum of 30 credit hours in Ocean Sciences, including:
 - a. Ocean Sciences 2000 (or Biology 3710), 2001, 2100 and 2500. Ocean Sciences 1000, completed under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems), will count as 3 of the required 30 credit hours in Ocean Sciences;
 - b. at least 9 credit hours in Ocean Sciences courses at the 3000 and/or 4000 level. Choices include but are not limited to Ocean

Sciences 3000, 3002, 3600, 3640, 4000, 4100, 4122, 4200, 4300, 4601; and

8. elective courses as necessary to make up the total of 120 credit hours.

No changes in sections 11.9.4 and 11.9.4.1

11.9.4.2 Program Regulations for the Honours in Ocean Sciences

Students must successfully complete:

- the 30 credit hours required under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems);
- Chemistry 2400 (or equivalent). Chemistry 2440 will be accepted as a substitute for Chemistry 2400. However, a number of advanced Science courses may require Chemistry 2400 and 2401. Students are therefore strongly encouraged to complete the Chemistry 2400/2401 sequence or otherwise carefully plan their options;
- 3. Physics 1021 or 1051;
- Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550(or equivalent);
- 5. a minimum of 12 credit hours chosen from:
 - a. Biology 2060, 2122, 2250, 2600, 2900;
 - b. Biochemistry 2100, 2201 or the former
 - 2101, 3206 or 3106, 3207 or 3107, 3108;
- 6. a minimum of 45 credit hours in Ocean Sciences, including:
 - a. Ocean Sciences 2000 (or Biology 3710), 2001, 2100, 2200, 2300 and 2500. Ocean Sciences 1000, completed under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems), will count as 3 of the required 45 credit hours in Ocean Sciences;
 - at least 18 credit hours in Ocean Sciences courses at the 3000 and/or 4000 level. Choices include but are not limited to Ocean Sciences 3000, 3002, 3600, 3640, 4000, 4100, 4122, 4200, 4300, 4601;
 - c. Ocean Sciences 499A/B; and
- elective courses as necessary to make up the total of 120 credit hours including a minimum of 15 credit hours at the 3000 and/or 4000 level in any of Biochemistry, Biology, Chemistry, Earth Sciences, Environmental Science, Geography, <u>Ocean Sciences</u> or Physics (these 15 credit hours can include courses completed as part of the requirements in 5.b. but not those required as part of 6. above).

Those courses in which a grade "B" or an average of 75% or higher are required to graduate with an Honours degree as per clause 1. of **Academic Standing** in the **Degree Regulations** for the Honours Degree of Bachelor of Science, are the 42 credit hours in Ocean Sciences courses at the 2000, 3000 and/or 4000 level, and 15 credit hours in courses at the 3000 and/or 4000 level in any of Biochemistry, Biology, Chemistry, Earth Sciences, Environmental Science, Geography, or Physics.

Students should be aware of a number of credit restrictions and refer to the **Course Descriptions** section for information.

No changes in section 11.9.4.3 CALENDAR ENTRY AFTER CHANGES (under Section 11.9 Ocean Sciences)

No changes in sections 11.9 and 11.9.1

11.9.2 Minor in Sustainable Aquaculture and Fisheries Ecology

Students who take a Minor in Sustainable Aquaculture and Fisheries Ecology will complete 24 credit hours as follows:

- 1. Ocean Sciences 1000, 2001, 3000, 3002, 4300;
- six credit hours selected from: Ocean Sciences 2000 (or Biology 3710), 3600, 3640, 4000, 4122, 4200, 4601, or other applicable courses at the 3000 level or above, as approved by the Head of the Department or delegate;
- 3. three credit hours selected from:
 - a. Biology 2122, 3401, 3640, 3715, 4251, 4605, 4750;
 - b. Biochemistry 3107, 3402, 4002, 4101, 4104, 4105, 4200, 4201;
 - c. Geography 4300.

Course prerequisites stipulated in the Course Descriptions shall apply to the Minor in Sustainable Aquaculture and Fisheries Ecology.

No changes in sections 11.9.3 and 11.9.3.1

11.9.3.2 Program Regulations for the Major in Ocean Sciences

Students must successfully complete:

- the 30 specified credit hours required under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems);
- 2. Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550;
- 3. Physics 1021 or 1051;
- 4. a minimum of 30 credit hours in Ocean Sciences, including:
 - a. Ocean Sciences 2000 (or Biology 3710), 2001, 2100 and 2500. Ocean Sciences 1000, completed under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems), will count as 3 of the required 30 credit hours in Ocean Sciences;
 - b. at least one of Ocean Sciences 2200 or 2300; and
 - c. at least 9 credit hours in Ocean Sciences courses at the 3000 and/or 4000 level;
- extra Science courses as necessary to fulfil the minimum requirement for 78 credit hours in Science as stipulated under Electives of the Degree Regulations for the General Degree of Bachelor of Science. The program

should include a minimum of 15 credit hours in Science courses at the 3000 and/or 4000 level; and

6. elective courses as necessary to make up the total of 120 credit hours.

11.9.3.3 Program Regulations for the Major in Ocean Sciences (Environmental Systems)

Students must successfully complete:

- 1. the 30 credit hours required under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems);
- 2. Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550;
- 3. Physics 1021 or 1051;
- 4. Geography 1050, and at least two of Geography 2102, 2195, or 2425;
- 5. Earth Sciences 1002, 2502;
- 6. at least 9 credit hours at the 3000 and/or 4000 level chosen from:
 - a. Geography 3120, 3140, 3250, 3425, 3510, 3905, the former 3907, 4250, 4908, 4917; and
 - b. Earth Sciences 3600, 4605, 4903.
- 7. a minimum of 30 credit hours in Ocean Sciences, including:
 - a. Ocean Sciences 2000 (or Biology 3710), 2001, 2100 and 2500. Ocean Sciences 1000, completed under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems), will count as 3 of the required 30 credit hours in Ocean Sciences;
 - b. at least 9 credit hours in Ocean Sciences courses at the 3000 and/or 4000 level; and
- 8. elective courses as necessary to make up the total of 120 credit hours.

No changes in sections 11.9.4 and 11.9.4.1

11.9.4.2 Program Regulations for the Honours in Ocean Sciences

Students must successfully complete:

- 1. the 30 credit hours required under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems);
- Chemistry 2400 (or equivalent). Chemistry 2440 will be accepted as a substitute for Chemistry 2400. However, a number of advanced Science courses may require Chemistry 2400 and 2401. Students are therefore strongly encouraged to complete the Chemistry 2400/2401 sequence or otherwise carefully plan their options;
- 3. Physics 1021 or 1051;
- 4. Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550;
- 5. a minimum of 12 credit hours chosen from:
 - a. Biology 2060, 2122, 2250, 2600, 2900;
 - b. Biochemistry 2100, 2201 or the former 2101, 3206 or 3106, 3207 or 3107, 3108;

- 6. a minimum of 45 credit hours in Ocean Sciences, including:
 - a. Ocean Sciences 2000 (or Biology 3710), 2001, 2100, 2200, 2300 and 2500. Ocean Sciences 1000, completed under Admission Requirements for the Major in Ocean Sciences or the Major in Ocean Sciences (Environmental Systems), will count as 3 of the required 45 credit hours in Ocean Sciences;
 - b. at least 18 credit hours in Ocean Sciences courses at the 3000 and/or 4000 level;
 - c. Ocean Sciences 499A/B; and
- 7. elective courses as necessary to make up the total of 120 credit hours including a minimum of 15 credit hours at the 3000 and/or 4000 level in any of Biochemistry, Biology, Chemistry, Earth Sciences, Environmental Science, Geography, Ocean Sciences or Physics (these 15 credit hours can include courses completed as part of the requirements in 5.b. but not those required as part of 6. above).

Those courses in which a grade "B" or an average of 75% or higher are required to graduate with an Honours degree as per clause 1. of **Academic Standing** in the **Degree Regulations** for the Honours Degree of Bachelor of Science, are the Ocean Sciences courses at the 2000, 3000 and/or 4000 level, and 15 credit hours in courses at the 3000 and/or 4000 level in any of Biochemistry, Biology, Chemistry, Earth Sciences, Environmental Science, Geography, or Physics.

Students should be aware of a number of credit restrictions and refer to the **Course Descriptions** section for information.

No changes in section 11.9.4.3

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

From	Response Received
Grenfell campus	No
Faculty of Business Administration	No
Faculty of Education	No
Faculty of Engineering & Applied Science	Yes
Faculty of Humanities & Social Science	No
Faculty of Science	Yes
Department of Biochemistry	
Department of Biology	Х
Department of Chemistry	
Department of Computer Sciences	
Department of Earth Sciences	
Department of Economics	
Department of Geography	X
Department of Mathematics and Statistics	
Department of Physics and Physical Oceanography	X
Department of Psychology	Х
Marine Institute	Yes
School of Medicine	Yes

The request for feedback and responses received are provided in the Appendix.

LIBRARY REPORT

See Appendix

RESOURCE IMPLICATIONS NA

APPENDIX – CONSULTATIONS

Message Sent

From: "Fletcher, Garth" <<u>fletcher@mun.ca</u>> Date: Thursday. October 17, 2019 at 1:13 PM **To:** "Associate Dean of Science (Undergraduate)" <a dsu@mun.ca>, BiocDHundergrad <biocdhundergrad@mun.ca>, Business <fba.ad.undergrad@mun.ca>, "chemconsult@mun. ca (chemconsult@mun.ca)" <chemconsult@mun.ca>, "'cschair@mun.ca'" <cs-chair@mun.ca>, Earth Sciences <eascugcon@mun.ca>, "Locke, Wade" <<u>wlocke@mun.ca</u>>, "Hicks, Sue" <<u>shicks@mun.ca</u>>, Engineering <engrconsult@mun.ca>, Erin <ekalcock@mun.ca>, Grenfell Campus <associatevpoffice@grenfell.mun.ca>, Faculty of Humanities and Social Sciences <hss@mun.ca>, "'mathconsult@mun.ca'" <mathconsult@mun.ca>, Medicine <deanofmedicine@med.mun.ca>, "'miugconsultations@mi.mun.ca'" <mugconsultations@mi.mun.ca>, "Catto, Norm" <ncatto@mun.ca>, Physics Head <physicshead@mun.ca>, "psychology.head@mun.ca" <psychology.head@mun.ca>, Suzanne Dufour <sdufour@mun.ca>, "Chapman, Tom" <tomc@mun.ca> Cc: "amercier@mun.ca" <amercier@mun.ca> Subject: Proposals for Calendar Changes

Colleagues, I have attached two proposals for calendar changes:

- 1. A proposal to make minor housekeeping changes to our academic program descriptions.
- A proposal for adjusting the prerequisites and descriptions of three courses (OCSC 1000, 4000, and 4122) as well as removing OCSC 4100 from our course offerings.

Could I have your feedback by November 6 please.

Regards

Garth

Garth L. Fletcher Head and Professor Emeritus Department of Ocean Sciences Ocean Sciences Centre Memorial University St John's NL Canada, A1C 5S7 TEL: 709-864-3276 FAX 709-864-3220 Email <u>fletcher@mun.ca</u>

Feedback Received

From: Catto, Norm Sent: October-17-19 2:00 PM

To: Fletcher, Garth <fletcher@mun.ca>; Associate Dean of Science (Undergraduate) <adsu@mun.ca>; BiocDHundergrad <biocdhundergrad@mun.ca>; Business <fba.ad.undergrad@mun.ca>; chemconsult@mun. ca (chemconsult@mun.ca) <chemconsult@mun.ca>; 'cs-chair@mun.ca' <cs-chair@mun.ca>; Earth Sciences <eascugcon@mun.ca>; Locke, Wade <wlocke@mun.ca>; Hicks, Sue <shicks@mun.ca>; Engineering <engrconsult@mun.ca>; Alcock, Erin <ekalcock@mun.ca>; Grenfell Campus <associatevpoffice@grenfell.mun.ca>; Faculty of Humanities and Social Sciences <hss@mun.ca>; 'mathconsult@mun.ca' <mathconsult@mun.ca>; Medicine <deanofmedicine@med.mun.ca>; 'miugconsultations@mi.mun.ca' <miugconsultations@mi.mun.ca>; Physics Head <physicshead@mun.ca>; Dyschology.head@mun.ca; Suzanne Dufour <sdufour@mun.ca>; Chapman, Tom <tomc@mun.ca> Cc: amercier@mun.ca Subject: RE: Proposals for Calendar Changes

"Senior course" isn't defined formally ... it should read "3000-level or above" (e.g.)

Norm Catto Head, Department of Geography Memorial University St. John's NL A1B 3X9 Canada 1-709-864-7463 Fax 1-709-864-3119

From: Head Psychology Sent: October-18-19 10:10 AM To: Fletcher, Garth <fletcher@mun.ca> Subject: RE: Proposals for Calendar Changes

Hi Garth,

These look fine to me...

Cheers,

Ken

From: cvardy@mun.ca [mailto:cvardy@mun.ca]
Sent: October-17-19 3:14 PM
To: Fletcher, Garth <fletcher@mun.ca>
Cc: Margaret.Steele@med.mun.ca
Subject: FW: Proposals for Calendar Changes

Good Day

We have reviewed your two proposals for calendar changes and the Faculty of Medicine is supportive.

Regards

Cathy

CATHY VARDY, MD, FRCPC | VICE DEAN AND PROFESSOR OF PEDIATRICS

Faculty of Medicine Health Sciences Centre Room M2M319 Memorial University of Newfoundland St. John's, Newfoundland | A1B 3V6

T 709 864 6417 | F 709 864 6336

From: Physics Head Sent: October 22, 2019 4:42 PM To: Fletcher, Garth <fletcher@mun.ca>; jmunroe@mun.ca Subject: Re: Proposals for Calendar Changes

Hi Garth,

Based on feedback here, those changes all look very minor yet reasonable.

Kris

From: Engineering Consult [mailto:engrconsult@mun.ca]
Sent: October-23-19 3:08 PM
To: Fletcher, Garth fletcher@mun.ca
Cc: Edmunds, Jayde edmundsj@mun.ca
Cc: Edmunds, Jayde edmundsj@mun.ca
Guinton bruce.guinton@mun.ca
Subject: Re: Proposals for Calendar Changes

Dear Dr. Fletcher,

Thank you for the opportunity to comment on the Calendar change documents for various program regulations in Ocean Sciences.

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.

Our only comment is the same as one offered by Dr. Catto (Geography) on Oct. 17.

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

From: Suzanne Dufour [mailto:sdufour@mun.ca]
Sent: October-31-19 11:43 AM
To: Fletcher, Garth <fletcher@mun.ca>; jodyb@mun.ca
Subject: Fwd: Proposals for Calendar Changes

Good morning Garth,

The Biology Undergraduate Studies Committee has reviewed the proposed changes to OCSC program descriptions and courses. While we have no concerns with those changes, we would like to specify that we will not be changing the prerequisites to BIOL 4122 (same as OCSC 4122) to correspond with the proposed changes to OCSC 4122 prerequisites. We are of the opinion that a 4th year Biology course on Advanced Studies of Marine Animals should have as a prerequisite a full-semester course on invertebrate zoology (BIOL 2122) that includes a lab, as it will more adequately prepare students for in-depth examination and hands-on experimentation with marine animals (especially since most marine animals are invertebrates). Based on its course description, the proposed alternative, OCSC 2000 Introductory Biological Oceanography, includes an "introduction to major groups of ... invertebrates and fish" but does not cover marine invertebrate diversity, anatomy, and form-function relationships in as much detail as BIOL 2122, and does not have a lab. We therefore do not consider OCSC 2000 and BIOL 2122 as interchangeable prerequisites for BIOL 4122.

Best wishes, Suzanne

Suzai

Dr. Suzanne Dufour Associate Professor and Deputy Head (Undergraduate) Department of Biology Memorial University of Newfoundland St. John's, NL A1B 3X9 Canada

On 11-Nov.-2019 10:08 a.m., Annie Mercier wrote:

Dear Suzanne:

We thank you and the Biology Undergraduate Studies Committee for your input. We have discussed this internally and also sought counsel regarding the possibility of listing different prerequisites for the two sections of OCSC/BIOL 4122. However, the prerequisites must be uniform, and as the department of record we have a responsibility to make sure the course is accessible to all students who can benefit from it. Nevertheless, to address your comment about lab/hands on experience, we will modify the prerequisites to "...OCSC 2000 and 2500 (or Biology 2122)...".

All the best,

Annie

Annie Mercier, PhD Professor and Deputy Head, Department of Ocean Sciences Memorial University (Ocean Sciences Centre) St. John's, NL, Canada, A1C 5S7 Tel: (709) 864-2011 Email: <u>amercier@mun.ca</u> www.mun.ca/osc/amercier/bio.php

From: MIUG Consultations [mailto:MIUGconsultations@mi.mun.ca]
Sent: November 4, 2019 1:56 PM
To: Fletcher, Garth <fletcher@mun.ca>
Subject: RE: Proposals for Calendar Changes

Hi Garth,

Thank you for the opportunity to review and comment on these two proposals. We are happy to support them.

Regards, Bev Bev Fleet Chair, Undergraduate Studies Committee Marine Institute, Memorial University TEL: 709-778-0369 FAX: 709-778-0535 Bev.Fleet@mi.mun.ca

From: Alcock, Erin Sent: Friday, November 8, 2019 2:57 PM To: Fletcher, Garth <fletcher@mun.ca> Subject: Re: Proposals for Calendar Changes

Dr. Fletcher,

I have reviewed all of the calendar changes and see no items that will be of concern to the Library.

Best,

Erin Alcock

--

Erin Alcock Science Research Liaison Librarian QEII Library : Memorial University of Newfoundland : 709-864-8316

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:

- \Box New course(s):
- □ Amended or deleted course(s):
- □ New program(s):
- \boxtimes 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 Programs

PROGRAM TITLE

11.11.3 Requirements for a Major in Psychology

RATIONALE

We have had a number of students ask whether lab courses in subjects other than Biology, Chemistry and Physics can satisfy requirement 11.11.3.2.d. Some aspects of Biochemistry, Computer Science and Ocean Sciences are related to Psychology so we feel that this program requirement should be expanded to include those subject areas.

CALENDAR CHANGES

11.11.3 Requirements for a Major in Psychology

Students completing this program cannot receive credit for Psychology 2920. Students who intend to pursue graduate studies should take courses leading to the Honours degree.

- Students may Major in Psychology as part of either a B.A. or a B.Sc. program, and should consult the <u>Degree Regulations</u> for the General Degree of Bachelor of Science or the <u>Degree Regulations</u> for the General Degree of Bachelor of Arts, as appropriate. All Majors are required to complete a minimum of 42 credit hours of Psychology as listed below:
 - a. Psychology 1000, 1001, 2520 (or 2521), 2910, 2911, 2930.
 - Twelve credit hours in Psychology chosen from the following: 3050, 3100, the former PSYC 3250, 3251, 3350, 3450, 3620, 3650, 3750, or one of 3800, 3810, 3820, 3830, 3840 or 3860.
 - c. Twelve credit hours of 4000-level courses in Psychology, of which at least one must be a research experience course and one must be a selected topics course.
- 2. Psychology Majors following the B.Sc. program are also required to complete the following:
 - a. Mathematics 1000 (or equivalent).
 - b. Biology 1001 and 1002.
 - c. Either Chemistry 1010 and the former 1011 (or 1050 and 1051); OR Physics 1020 (or 1050) and 1021 (or 1051).

Note:

First year students should think carefully about whether Chemistry or Physics best suits their future program needs. Students should examine the prerequisites for upper-level science courses and attempt to take them in their first year. d. Six credit hours of laboratory courses at the 2000 level or above in one of <u>Biochemistry</u>, Biology, Chemistry, Computer Science, Ocean Sciences or Physics. <u>Students are advised to consult the Course Descriptions section</u> of the Calendar for their chosen lab courses to ensure pre-requisites are <u>met.</u>

Note:

Biology/Psychology 3750 and 4701 and Biology 3053 cannot be used to satisfy the requirement of 6 laboratory credit hours at the 2000 level or above in either Biology, Chemistry, or Physics.

3. Psychology Majors following the B.A. program are also required to complete Mathematics 1000 or two of 1090, 1050, 1051 (or equivalent), and are encouraged to complete at least 6 credit hours in Biology.

CALENDAR ENTRY AFTER CHANGES 11.11.3 Requirements for a Major in Psychology

Students completing this program cannot receive credit for Psychology 2920. Students who intend to pursue graduate studies should take courses leading to the Honours degree.

- Students may Major in Psychology as part of either a B.A. or a B.Sc. program, and should consult the <u>Degree Regulations</u> for the General Degree of Bachelor of Science or the <u>Degree Regulations</u> for the General Degree of Bachelor of Arts, as appropriate. All Majors are required to complete a minimum of 42 credit hours of Psychology as listed below:
 - a. Psychology 1000, 1001, 2520 (or 2521), 2910, 2911, 2930.
 - Twelve credit hours in Psychology chosen from the following: 3050, 3100, the former PSYC 3250, 3251, 3350, 3450, 3620, 3650, 3750, or one of 3800, 3810, 3820, 3830, 3840 or 3860.
 - c. Twelve credit hours of 4000-level courses in Psychology, of which at least one must be a research experience course and one must be a selected topics course.
- 2. Psychology Majors following the B.Sc. program are also required to complete the following:
 - a. Mathematics 1000 (or equivalent).
 - b. Biology 1001 and 1002.
 - c. Either Chemistry 1010 and the former 1011 (or 1050 and 1051); OR Physics 1020 (or 1050) and 1021 (or 1051).

Note:

First year students should think carefully about whether Chemistry or Physics best suits their future program needs. Students should examine the prerequisites for upper-level science courses and attempt to take them in their first year. d. Six credit hours of laboratory courses at the 2000 level or above in one of Biochemistry, Biology, Chemistry, Computer Science, Ocean Sciences or Physics. Students are advised to consult the Course Descriptions section of the Calendar for their chosen lab courses to ensure pre-requisites are met.

Note:

Biology/Psychology 3750 and 4701 and Biology 3053 cannot be used to satisfy the requirement of 6 laboratory credit hours at the 2000 level or above in either Biology, Chemistry, or Physics.

3. Psychology Majors following the B.A. program are also required to complete Mathematics 1000 or two of 1090, 1050, 1051 (or equivalent), and are encouraged to complete at least 6 credit hours in Biology.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Education	
Engineering and Applied Science	Supports the proposed change
Grenfell Campus (Arts & Social Sciences)	
Human Kinetics and Recreation	
Library	No impact on Library resources
Marine Institute	Supports the proposed change
Pharmacy	No concerns
Social Work	
Science	
Biochemistry	
Biology	
Chemistry	
Earth Sciences	
 Mathematics and Statistics 	Reviewed, no comment
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

From: Psych Deputy Head [mailto:psychdeputyhead@mun.ca]Sent: Friday, October 25, 2019 11:54 AMSubject: Proposed Calendar changes from Psychology

Hi,

The Psychology department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

2. Removing Math 1001 requirement for BHNR major

- 3. Update to the wording of BHNR honours requirements
- 4. Change to the way honours theses are graded
- 5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

6. Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

Please send your comments on these proposals to psyugradadvice@mun.ca.

Thanks,

Christina

Christina Thorpe Deputy Head, Undergraduate Studies Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>psychdeputyhead@mun.ca</u>

Engineering:

From: Engineering Consult <engrconsult@mun.ca> Sent: Monday, October 28, 2019 9:08 AM To: Cathy Hyde <psyugradadvice@mun.ca> Cc: Edmunds, Jayde <edmundsj@mun.ca>; Peters, Dennis <dpeters@mun.ca>; Bruce Quinton <bruce.quinton@mun.ca> Subject: Re: Proposed Calendar changes from Psychology

Dear Dr. Thorpe,

Thank you for the opportunity to comment on the sets of Calendar change documents for Psychology.

Unfortunately, your documents arrived too late for inclusion in the agenda package for the October meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science. The next scheduled meeting is not until Nov. 20. Upon review, I find no impact on Engineering programs.

The use of PWD/PAS/FAL for the Honours thesis seems to us to be reasonable.

I am 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

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Psychology Date: 2019-11-05 19:42 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: Cathy Hyde <<u>psyugradadvice@mun.ca</u>>

Calendar changes 1 - 4, and 6 will have no impact on library resources.

The library has sufficient resources to support proposal 6. Dog behaviour has been an active research area at MUN for some time, and our collection in this area is consequently well-developed. As well as an unlimited user perpetual access copy of the required text, the books and chapters related to dog and animal behaviour in the PsycBooks collection will also provide many options for supplemental reading.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

Marine Institute:

From: MIUG Consultations <MIUGconsultations@mi.mun.ca>
Sent: Friday, October 25, 2019 3:24 PM
To: Cathy Hyde <psyugradadvice@mun.ca>
Subject: RE: Proposed Calendar changes from Psychology

Hello,

Thank you for the opportunity to review and comment on the Calendar Change Proposals for Psychology. These will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: "Math Consult" < mathconsult@mun.ca>

Subject: RE: Proposed Calendar changes from Psychology

Date: October 25, 2019 at 2:12:33 PM NDT

To: psychdeputyhead@mun.ca

Hi Christina,

Regarding your proposals, Math & Stats offers:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

No comment.

2. Removing Math 1001 requirement for BHNR major

Could Math 1001 be added to the list of acceptable courses in line f)? Otherwise, it would be very difficult for a BHNR student to minor in math.

3. Update to the wording of BHNR honours requirements

No comment.

4. Change to the way honours theses are graded

Compared to our honours performance, I would think that 10% of students getting PWD is very small – but I know you have a very different cohort, and a lot of honours students. I think direct comparisons between our two units in this matter is not useful.

5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

This title is very attractive, and I think would attract a lot of interest. I'm confused about the prerequisite – if a student has no interest in animal behaviour then they would likely not take this course. Since desire to register would signal a relevant interest, should this course have no prerequisite requirements other than the recommendation of Psyc 1000? It will become a nuisance to the instructor to have to grant the PR waivers.

 Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

No comment.

Regards,

Tara

Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

Hi Christina,

The School of Pharmacy has no concerns with the proposed changes, I don't believe they will affect our students or programs.

Erin

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Erin Davis, PharmD

Associate Dean Undergraduate Studies

Associate Professor

Memorial University School of Pharmacy

LIBRARY REPORT

Not required.

RESOURCE IMPLICATIONS

No resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS N/A

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:

- \Box New course(s):
- □ Amended or deleted course(s):
- □ New program(s):
- \boxtimes 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 Programs

PROGRAM TITLE

11.11.6 Requirements for Honours in Behavioural Neuroscience (B.Sc. Only)

RATIONALE

The Psychology course requirements for the Behavioural Neuroscience Honours, (11.11.6.1a and 11.11.6.1.c), Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours (10.2.6.6) and Biochemistry (Nutrition) and Psychology (Behavioural Neuroscience) Joint Honours (10.2.7.4) wording can be easily misinterpreted. Reordering the course listing in 11.11.6.1.a, 10.2.6.6 and 10.2.7.4, and removing a ';' in requirement 11.11.6.1.c will make these requirements clear.

CALENDAR CHANGES

11.11.6 Requirements for Honours in Behavioural Neuroscience (B.Sc. Only)

Students in Behavioural Neuroscience should consult <u>Degree Regulations</u> for the Honours Degree of Bachelor of Science. Students completing this program cannot receive credit for Psychology 2920.

- 1. Honours students in Behavioural Neuroscience are required to complete the following Psychology courses:
 - a. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, <u>3900,</u> <u>499A/B</u> one of the former 3250, 3810, 3830, 3840, or 3860, 3900, 499A/B
 - b. <u>Three credit hours chosen from</u> the following: the former 3250, 3810, 3830, 3840, or 3860, 3900, 499A/B
 - c. One further course <u>Three credit hours</u> in Psychology chosen from the following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750;
 - Any research experience course and one of Psychology 4850, 4851;
 4852, 4853, or 4854; or, any selected topics course and Psychology 4870.
- Honours students in Behavioural Neuroscience must also complete the requirements listed in Clauses 2. and 3. of the requirements for a Major in Behavioural Neuroscience.
- 3. In accordance with Academic Standing under the <u>Degree Regulations</u> for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 1. and 3. of the requirements for a major in Behavioural Neuroscience and Clause 1 of the requirements for honours in Behavioural Neuroscience, except those at the 1000 level.

10.2.6 Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours

Note:

Students completing this program cannot receive credit for Psychology 2920. The following courses (or equivalent) are required to complete the 120 credit hours in courses required for the degree:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses;
- Chemistry 1050 and 1051 (or 1200 and 1001), Biology 1001 and 1002, Mathematics 1000 and 1001, Physics 1050, (or 1020), 1051 (or 1021);
- 3. Biochemistry 2200 (or 2100), 2201, 2901, 3105, 3206;
- 4. Either Biochemistry 3108 and 3207, or Medicine 310A/B;
- Nine credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 42 10 or 4211, 4230, 4231-4239;
- Psychology 1000, 1001, 2521, 2910, 2911, 2930, <u>3800, 3820, 3900</u>; one of the former PSYC 3250, 3810, 3830, 3840, or 3860; 3800, 3820, 3900; one further course in Psychology chosen from the following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750; any research experience course and one of Psychology 4850, 4851, 4852, 4853, or 4854; or, any selected topics course and Psychology 4870.
- 7. <u>Three credit hours in Psychology chosen from the following: the former</u> <u>3250, 3810, 3830, 3840, or 3860;</u>
- 8. <u>Three credit hours in Psychology chosen from the</u> following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750;
- 9. <u>Any Psychology research experience course and one of</u> <u>Psychology 4850, 4851, 4852, 4853, or 4854; or, any Psychology selected topics</u> <u>course and Psychology 4870.</u>
- 10. Either Biochemistry 499A/B or Psychology 499A/B; and
- 11. Chemistry 2301, 2400, 2401.

Notes:

- As provided for under the <u>Graduation Requirements</u> for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 3., 4., 5., 6. and 7. <u>3 – 9</u> above, except those at the 1000 level.
- 2. Students in first year intending to follow this program should note the regulations for admission to Major programs in Psychology and that the deadline for submission of a completed application form to the Department of Psychology is June 1 for the Fall semester.

10.2.7 Biochemistry (Nutrition) and Psychology (Behavioural Neuroscience) Joint Honours

Note:

Students completing this program cannot receive credit for Psychology 2920. The following courses (or equivalent) are required:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 2. Chemistry 1050 and 1051 (or 1200 and 1001), Biology 1001 and 1002, Mathematics 1000, Physics 1020 or 1050, and 1021 (or 1051).
- Biochemistry 2200 (or 2100), 2201, 2600, 2901, 3203, 3206, 3906, Medicine 310A/B, 4300, 4301, 4502, one course chosen from: Biochemistry 3052, 3108, 3402, 3600, 4002, 4105, 4200, 4230, 4240, 4241-4249, Biology 3050.
- 4. <u>Three credit hours chosen from:</u> <u>Biochemistry 3052, 3108, 3402, 3600, 4002, 4105, 4200, 4230, 4240, 4241-</u> <u>4249, Biology 3050</u>
- Psychology 1000, 1001, 2521, 2910, 2911, 2930, <u>3800, 3820, 3900</u>; one of the former PSYC 3250, 3810, 3830, 3840, or 3860; 3800, 3820, 3900; one further course in Psychology chosen from the following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750; any research experience course and one of Psychology 4850, 4851, 4852, 4853, or 4854; or, any selected topics course and Psychology 4870.
- 6. <u>Three credit hours in Psychology chosen from the following: the former</u> <u>3250, 3810, 3830, 3840, or 3860;</u>
- 7. <u>Three credit hours in Psychology chosen from the following:</u> 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750;
- 8. Any Psychology research experience course and one of Psychology 4850, 4851, 4852, 4853, or 4854; or, any Psychology selected topics course and Psychology 4870.
- 9. Either Biochemistry 499A/B or Psychology 499A/B.
- 10. Chemistry 2400.
- 11. Other courses to complete at least the prescribed minimum of 120 credit hours in courses for the Joint Honours Degree.

Notes:

- As provided for under the <u>Graduation Requirements</u> for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 3., 4. and 5. <u>3 – 8</u> above, except those at the 1000 level.
- 2. Students in first year intending to follow this program should note the regulations as outlined for admission to Major programs in Psychology and that the deadline for submission of a completed application form to the Department of Psychology is June 1 for the Fall semester.

CALENDAR ENTRY AFTER CHANGES

11.11.6 Requirements for Honours in Behavioural Neuroscience (B.Sc. Only)

Students in Behavioural Neuroscience should consult <u>Degree Regulations</u> for the Honours Degree of Bachelor of Science. Students completing this program cannot receive credit for Psychology 2920.

- 1. Honours students in Behavioural Neuroscience are required to complete the following Psychology courses:
 - a. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, 3900, 499A/B
 - b. Three credit hours chosen from the following: the former 3250, 3810, 3830, 3840, or 3860
 - c. Three credit hours in Psychology chosen from the following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750;
 - d. Any research experience course and one of Psychology 4850, 4851, 4852, 4853, or 4854; or, any selected topics course and Psychology 4870.
- 2. Honours students in Behavioural Neuroscience must also complete the requirements listed in Clauses 2. and 3. of the requirements for a Major in Behavioural Neuroscience.
- 3. In accordance with Academic Standing under the <u>Degree Regulations</u> for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 1. and 3. of the requirements for a major in Behavioural Neuroscience and Clause 1 of the requirements for honours in Behavioural Neuroscience, except those at the 1000 level.

10.2.6 Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours

Note:

Students completing this program cannot receive credit for Psychology 2920. The following courses (or equivalent) are required to complete the 120 credit hours in courses required for the degree:

- Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses;
- 2. Chemistry 1050 and 1051 (or 1200 and 1001), Biology 1001 and 1002, Mathematics 1000 and 1001, Physics 1050, (or 1020), 1051 (or 1021);
- 3. Biochemistry 2200 (or 2100), 2201, 2901, 3105, 3206;
- 4. Either Biochemistry 3108 and 3207, or Medicine 310A/B;
- Nine credit hours to be selected from Biochemistry 3906 or 3907, 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4210 or 4211, 4230, 4231-4239;

- 6. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, 3900;
- 7. Three credit hours in Psychology chosen from the following: the former 3250, 3810, 3830, 3840, or 3860;
- Three credit hours in Psychology chosen from the following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750;
- Any Psychology research experience course and one of Psychology 4850, 4851, 4852, 4853, or 4854; or, any Psychology selected topics course and Psychology 4870.
- 10. Either Biochemistry 499A/B or Psychology 499A/B; and
- 11. Chemistry 2301, 2400, 2401.

Notes:

- As provided for under the <u>Graduation Requirements</u> for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 3 – 9 above, except those at the 1000 level.
- 2. Students in first year intending to follow this program should note the regulations for admission to Major programs in Psychology and that the deadline for submission of a completed application form to the Department of Psychology is June 1 for the Fall semester.

10.2.7 Biochemistry (Nutrition) and Psychology (Behavioural Neuroscience) Joint Honours

Note:

Students completing this program cannot receive credit for Psychology 2920. The following courses (or equivalent) are required:

- 1. Six credit hours in <u>Critical Reading and Writing (CRW)</u> courses, including at least 3 credit hours in English courses.
- 2. Chemistry 1050 and 1051 (or 1200 and 1001), Biology 1001 and 1002, Mathematics 1000, Physics 1020 or 1050, and 1021 (or 1051).
- Biochemistry 2200 (or 2100), 2201, 2600, 2901, 3203, 3206, 3906, Medicine 310A/B, 4300, 4301, 4502
- Three credit hours chosen from: Biochemistry 3052, 3108, 3402, 3600, 4002, 4105, 4200, 4230, 4240, 4241-4249, Biology 3050
- 5. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, 3900
- 6. Three credit hours in Psychology chosen from the following: the former 3250, 3810, 3830, 3840, or 3860;
- 7. Three credit hours in Psychology chosen from the following: 3050, 3100, 3251, 3350, 3450, 3620, 3650, 3750;
- Any Psychology research experience course and one of Psychology 4850, 4851, 4852, 4853, or 4854; or, any Psychology selected topics course and Psychology 4870.
- 9. Either Biochemistry 499A/B or Psychology 499A/B.
- 10. Chemistry 2400.
- 11. Other courses to complete at least the prescribed minimum of 120 credit hours in courses for the Joint Honours Degree.

Notes:

- As provided for under the <u>Graduation Requirements</u> for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 3 – 8 above, except those at the 1000 level.
- 2. Students in first year intending to follow this program should note the regulations as outlined for admission to Major programs in Psychology and that the deadline for submission of a completed application form to the Department of Psychology is June 1 for the Fall semester.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received	
Academic Advising Centre		
Humanities and Social Sciences		
Education		
Engineering and Applied Science	Supports the proposed change	
Grenfell Campus (Arts & Social Sciences)		
Human Kinetics and Recreation		
Library	No impact on Library resources	
Marine Institute	Supports the proposed change	
Pharmacy	No concerns	
Social Work		
Science		
Biochemistry		
Biology		
Chemistry		
Earth Sciences		
 Mathematics and Statistics 	No comment	
Ocean Sciences		
 Physics and Physical Oceanography 		

Email requesting consultation:

From: Psych Deputy Head [mailto:psychdeputyhead@mun.ca]Sent: Friday, October 25, 2019 11:54 AMSubject: Proposed Calendar changes from Psychology

Hi,

The Psychology department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

2. Removing Math 1001 requirement for BHNR major

- 3. Update to the wording of BHNR honours requirements
- 4. Change to the way honours theses are graded
- 5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

6. Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

Please send your comments on these proposals to psyugradadvice@mun.ca.

Thanks,

Christina

Christina Thorpe Deputy Head, Undergraduate Studies Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>psychdeputyhead@mun.ca</u>

Engineering:

From: Engineering Consult <engrconsult@mun.ca> Sent: Monday, October 28, 2019 9:08 AM To: Cathy Hyde <psyugradadvice@mun.ca> Cc: Edmunds, Jayde <edmundsj@mun.ca>; Peters, Dennis <dpeters@mun.ca>; Bruce Quinton <bruce.quinton@mun.ca> Subject: Re: Proposed Calendar changes from Psychology

Dear Dr. Thorpe,

Thank you for the opportunity to comment on the sets of Calendar change documents for Psychology.

Unfortunately, your documents arrived too late for inclusion in the agenda package for the October meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science. The next scheduled meeting is not until Nov. 20. Upon review, I find no impact on Engineering programs.

The use of PWD/PAS/FAL for the Honours thesis seems to us to be reasonable.

I am 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

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Psychology Date: 2019-11-05 19:42 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: Cathy Hyde <<u>psyugradadvice@mun.ca</u>>

Calendar changes 1 - 4, and 6 will have no impact on library resources.

The library has sufficient resources to support proposal 6. Dog behaviour has been an active research area at MUN for some time, and our collection in this area is consequently well-developed. As well as an unlimited user perpetual access copy of the required text, the books and chapters related to dog and animal behaviour in the PsycBooks collection will also provide many options for supplemental reading.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

Marine Institue:

From: MIUG Consultations <MIUGconsultations@mi.mun.ca>
Sent: Friday, October 25, 2019 3:24 PM
To: Cathy Hyde <psyugradadvice@mun.ca>
Subject: RE: Proposed Calendar changes from Psychology

Hello,

Thank you for the opportunity to review and comment on the Calendar Change Proposals for Psychology. These will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee Marine Institute, Memorial University

Math and Stats:

From: "Math Consult" <<u>mathconsult@mun.ca</u>>

Subject: RE: Proposed Calendar changes from Psychology

Date: October 25, 2019 at 2:12:33 PM NDT

To: cychdeputyhead@mun.ca

Hi Christina,

Regarding your proposals, Math & Stats offers:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

No comment.

2. Removing Math 1001 requirement for BHNR major

Could Math 1001 be added to the list of acceptable courses in line f)? Otherwise, it would be very difficult for a BHNR student to minor in math.

3. Update to the wording of BHNR honours requirements

No comment.

4. Change to the way honours theses are graded

Compared to our honours performance, I would think that 10% of students getting PWD is very small – but I know you have a very different cohort, and a lot of honours students. I think direct comparisons between our two units in this matter is not useful.

5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

This title is very attractive, and I think would attract a lot of interest. I'm confused about the prerequisite – if a student has no interest in animal behaviour then they would likely not take this course. Since desire to register would signal a relevant interest, should this course have no prerequisite requirements other than the recommendation of Psyc 1000? It will become a nuisance to the instructor to have to grant the PR waivers.

 Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

No comment.

Regards,

Tara

Tara Stuckless

HH 3004, ext. 8914

Chair, Undergraduate Studies Committee

Dept. of Mathematics and Statistics

Pharmacy:

Hi Christina,

The School of Pharmacy has no concerns with the proposed changes, I don't believe they will affect our students or programs.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

Associate Professor

Memorial University School of Pharmacy

LIBRARY REPORT

Not required.

RESOURCE IMPLICATIONS

No resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS N/A

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:

- \Box New course(s):
- \Box 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 Regulations

SECTION OF CALENDAR

Indicate the section of the Calendar impacted by the proposed change(s):

- □ Glossary of Terms Used in the Calendar
- □ Admission/Readmission to the University (Undergraduate)
- General Academic Regulations (Undergraduate)
- ⊠ Faculty of: Science
- □ School of:
- ☑ Department of: Psychology
- □ Other:

RATIONALE

The psychology department has previously given a numerical grade for the honours thesis (i.e., PSYC 499A/B). However, in consultation with the department and the students it was felt that with the growth in the number of students completing an honours degree (approximately 50 per year) it was difficult to ensure consistency in grading schemes by individual honour's supervisors. When each individual faculty member graded only their own few students it was difficult to know what the comparison group was. When the class was smaller the honours coordinator was able to provide some feedback to the supervisors, however with the growth in the program this was no longer feasible. It was felt that a fairer system was to instead have a Pass/Fail grading scheme. It was noted however, that we have some exceptional students that should be recognized for outstanding work. Therefore, we would like to have a third category of Pass with Distinction. To be considered for distinction, the student will need to be nominated by either their supervisor or the honours coordinator. A panel of faculty will then decide on a limited number of students - approximately 10% -- to receive Distinction in a given year. This decision will be based on input of the honours supervisor, the quality of the written thesis, and an oral presentation of their thesis.

CALENDAR CHANGES

11.11.4 Requirements for Honours in Psychology

Students completing this program cannot receive credit for Psychology 2920.

- Honours students in Psychology should consult <u>Degree Regulations</u> for the Honours Degree of Bachelor of Science or Bachelor of Arts (Honours) <u>Degree</u> <u>Regulations</u> as appropriate. All Honours students are required to complete the 60 credit hours of Psychology as listed below:
 - a. Psychology 1000, 1001, 2520 (or 2521), 2910, 2911, 2930, 3900, 4910, 4 99A/B

- b. Eighteen credit hours chosen from the alternatives listed in Clause 1. b. of the requirements for a Major in Psychology
- c. Twelve credit hours of 4000-level courses in Psychology, of which at least one must be a research experience course and one must be a selected topics course.
- 2. Honours students must also complete the requirements listed in either Clause 2. or Clause 3., as applicable, of the requirements for a Major in Psychology.
- 3. Honours students will be required to submit in their graduating year, an undergraduate thesis (Psychology 499A/B) which demonstrates their competence in Experimental Psychology.
- 4. <u>The overall evaluation of the Honours dissertation (i.e. the Psychology 499B grading evaluation) will result in one of the following grades being awarded:</u> <u>Pass with Distinction: Indicates outstanding performance in both the formal written report and a supplementary oral presentation. Pass with distinction shall normally be awarded to no more than 10% of the class and will be decided by a panel of psychology faculty members.</u>

Pass: Indicates performance meets expectations in the formal written report and in classwork.

Fail: Indicates failing performance in the formal written report and/or the classwork.

CALENDAR ENTRY AFTER CHANGES 11.11.4 Requirements for Honours in Psychology

Students completing this program cannot receive credit for Psychology 2920.

- Honours students in Psychology should consult <u>Degree Regulations</u> for the Honours Degree of Bachelor of Science or Bachelor of Arts (Honours) <u>Degree</u> <u>Regulations</u> as appropriate. All Honours students are required to complete the 60 credit hours of Psychology as listed below:
 - a. Psychology 1000, 1001, 2520 (or 2521), 2910, 2911, 2930, 3900, 4910, 4 99A/B
 - b. Eighteen credit hours chosen from the alternatives listed in Clause 1. b. of the requirements for a Major in Psychology
 - c. Twelve credit hours of 4000-level courses in Psychology, of which at least one must be a research experience course and one must be a selected topics course.
- 2. Honours students must also complete the requirements listed in either Clause 2. or Clause 3., as applicable, of the requirements for a Major in Psychology.
- 3. Honours students will be required to submit in their graduating year, an undergraduate thesis (Psychology 499A/B) which demonstrates their competence in Experimental Psychology.
- 4. The overall evaluation of the Honours dissertation (i.e. the Psychology 499B grading evaluation) will result in one of the following grades being awarded:

Pass with Distinction: Indicates outstanding performance in both the formal written report and a supplementary oral presentation. Pass with distinction shall normally be awarded to no more than 10% of the class and will be decided by a panel of psychology faculty members.

Pass: Indicates performance meets expectations in the formal written report and in classwork.

Fail: Indicates failing performance in the formal written report and/or the classwork.

SECONDARY CALENDAR CHANGES

N/A

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Education	
Engineering and Applied Science	Supports the proposed change, noted that the use of PWD/PAS/FAL for the Honours thesis seems to be reasonable
Grenfell Campus (Arts & Social Sciences)	
Human Kinetics and Recreation	
Library	No impact on Library resources
Marine Institute	Supports the proposed change
Pharmacy	No concerns
Social Work	
Science	
Biochemistry	
Biology	
Chemistry	
Office of the Dean	Question re: how the new grading system will affect Dean's list criteria
Earth Sciences	
 Mathematics and Statistics 	Provided info re: Math and Stats honours performance
Ocean Sciences	
Physics and Physical Oceanography	

Email requesting consultation:

From: Psych Deputy Head [mailto:psychdeputyhead@mun.ca] Sent: Friday, October 25, 2019 11:54 AM Subject: Proposed Calendar changes from Psychology

Hi,

The Psychology department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

2. Removing Math 1001 requirement for BHNR major

- 3. Update to the wording of BHNR honours requirements
- 4. Change to the way honours theses are graded
- 5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

6. Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

Please send your comments on these proposals to <u>psyugradadvice@mun.ca</u>.

Thanks,

Christina

Christina Thorpe Deputy Head, Undergraduate Studies Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>psychdeputyhead@mun.ca</u>

Office of the Dean of Science:

From: Christina Thorpe <<u>cthorpe@mun.ca</u>>
Sent: Monday, October 28, 2019 3:05 PM
To: Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>>
Cc: Hyde, Cathy <<u>cathy@mun.ca</u>>
Subject: Re: Proposed Calendar changes from Psychology

Hi Travis,

I know that biology honours (and the co-op work term courses) also use pass/fail. I had assumed that our honours grade would be done counted the same way as Biology and the co-op courses. Although I confess that I am not sure how the Dean's Office deals with those. How do you count PASS for the biology honours and for co-op courses? Christina

Christina Thorpe Associate Professor Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>cthorpe@mun.ca</u>

On Oct 25, 2019, at 2:20 PM, Associate Dean of Science (Undergraduate) < adsu@mun.ca > wrote:

Hi Christina,

This email is about the grading in the dissertation course for Psychology.

I wonder if you have given thought about what we should do for the Dean's list? How should a PASS be counted in the Dean's list criteria?

Take care,

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE

(Administration & Undergraduate)

Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155

http://www.faculty.mun.ca/tfridgen/

Engineering:

From: Engineering Consult <engrconsult@mun.ca> Sent: Monday, October 28, 2019 9:08 AM To: Cathy Hyde <psyugradadvice@mun.ca> Cc: Edmunds, Jayde <edmundsj@mun.ca>; Peters, Dennis <dpeters@mun.ca>; Bruce Quinton <bruce.quinton@mun.ca> Subject: Re: Proposed Calendar changes from Psychology

Dear Dr. Thorpe,

Thank you for the opportunity to comment on the sets of Calendar change documents for Psychology.

Unfortunately, your documents arrived too late for inclusion in the agenda package for the October meeting of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science. The next scheduled meeting is not until Nov. 20. Upon review, I find no impact on Engineering programs.

The use of PWD/PAS/FAL for the Honours thesis seems to us to be reasonable.

I am 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

Library:

------ Original Message ------Subject: RE: Proposed Calendar changes from Psychology Date: 2019-11-05 19:42 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: Cathy Hyde <<u>psyugradadvice@mun.ca</u>>

Calendar changes 1 - 4, and 6 will have no impact on library resources.

The library has sufficient resources to support proposal 6. Dog behaviour has been an active research area at MUN for some time, and our collection in this area is consequently well-developed. As well as an unlimited user perpetual access copy of the required text, the books and chapters related to dog and animal behaviour in the PsycBooks collection will also provide many options for supplemental reading.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

Marine Institue:

From: MIUG Consultations <MIUGconsultations@mi.mun.ca>
Sent: Friday, October 25, 2019 3:24 PM
To: Cathy Hyde <psyugradadvice@mun.ca>
Subject: RE: Proposed Calendar changes from Psychology

Hello,

Thank you for the opportunity to review and comment on the Calendar Change Proposals for Psychology. These will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Hyde, Cathy
Sent: Friday, November 8, 2019 12:33 PM
To: 'mathconsult@mun.ca' <mathconsult@mun.ca>
Cc: 'Christina Thorpe' <cthorpe@mun.ca>
Subject: FW: Proposed Calendar changes from Psychology

Hi Tara,

Thanks for your feedback. Here are responses to your comments below:

2. 11.11.5.3 is a requirement for 2000-level courses so I don't think we want to include math 1001 at this time. I understand your concern for math minors, I'll include it as a discussion point for our undergraduate studies committee for future consideration.

4. Thanks for the insight, it is helpful to know what other departments are experiencing even if the cohorts are not directly comparable.

5. You bring up a good point. We will change the PR to be "...OR relevant experience" rather than "...OR relevant experience/interest"

Thanks,

Cathy Hyde, MSc | Manager of Academic Programs, MSc

Department of Psychology

Memorial University of Newfoundland

Tel: (709) 864-3059

www.mun.ca/psychology/

Begin forwarded message:

From: "Math Consult" < mathconsult@mun.ca>

Subject: RE: Proposed Calendar changes from Psychology

Date: October 25, 2019 at 2:12:33 PM NDT

To: psychdeputyhead@mun.ca

Hi Christina,

Regarding your proposals, Math & Stats offers:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

No comment.

2. Removing Math 1001 requirement for BHNR major

Could Math 1001 be added to the list of acceptable courses in line f)? Otherwise, it would be very difficult for a BHNR student to minor in math.

3. Update to the wording of BHNR honours requirements

No comment.

4. Change to the way honours theses are graded

Compared to our honours performance, I would think that 10% of students getting PWD is very small – but I know you have a very different cohort, and a lot of honours students. I think direct comparisons between our two units in this matter is not useful.

5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

This title is very attractive, and I think would attract a lot of interest. I'm confused about the prerequisite – if a student has no interest in animal behaviour then they would likely not take this course. Since desire to register would signal a relevant interest, should this course have no prerequisite requirements other than the recommendation of Psyc 1000? It will become a nuisance to the instructor to have to grant the PR waivers.

 Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

No comment. Regards, Tara --Tara Stuckless HH 3004, ext. 8914 Chair, Undergraduate Studies Committee Dept. of Mathematics and Statistics

Pharmacy:

Hi Christina,

The School of Pharmacy has no concerns with the proposed changes, I don't believe they will affect our students or programs.

Erin

Erin Davis, PharmD

Associate Dean Undergraduate Studies

Associate Professor

Memorial University School of Pharmacy

LIBRARY REPORT

N/A

RESOURCE IMPLICATIONS

No resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS N/A

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:

- \boxtimes 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

PSYC 2740 Domestic Animal Behaviour

ABBREVIATED COURSE TITLE

Domestic Animal Behaviour

RATIONALE

This course is a broadening and regularization of a Selected Topics course that has been offered since 2016. It is being proposed as a non-majors or service course for students interested in the science of animal behaviour. This course will fill a niche for students who are interested in psychology and biology course content at the second year level, and its more specific focus on domestic animal behaviour is complementary to the restricted courses in the area of Animal Behaviour that are currently being offered (in Psychology and Biology). As a non-restricted course, students with various backgrounds in science and the humanities and an interest in animals are expected to enrol. Other individuals in the broader community who work with and/or own domestic animals (e.g., shelter workers, trainers, groomers, workers in veterinary practices, etc.) will likely be interested as well.

CALENDAR CHANGES

2740 Domestic Animal Behaviour focuses on behaviour in domestic animals, with a particular emphasis on dogs. Although dogs are one of the oldest domesticated species, canine science is just beginning to reveal insights into dog behaviour. Course topics will include the process of domestication, animal cognition, social behaviour and organization, human-animal interactions, and behaviour as an animal welfare indicator. When appropriate, the behaviour of other species will be examined for comparison.

PR: PSYC 1000 OR permission from instructor for students with relevant experience

CALENDAR ENTRY AFTER CHANGES

2740 Domestic Animal Behaviour focuses on behaviour in domestic animals, with a particular emphasis on dogs. Although dogs are one of the oldest domesticated species, canine science is just beginning to reveal insights into dog behaviour. Course topics will include the process of domestication, animal cognition, social behaviour and organization, human-animal interactions, and behaviour as an animal welfare indicator. When appropriate, the behaviour of other species will be examined for comparison.

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Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received
Academic Advising Centre	
Humanities and Social Sciences	
Education	
Engineering and Applied Science	Supports the proposed change
Grenfell Campus (Arts & Social Sciences)	
Human Kinetics and Recreation	
Library	The library has sufficient resources to support this proposal
Marine Institute	Supports the proposed change
Pharmacy	No concerns
Social Work	
Science	
Biochemistry	
Biology	
Chemistry	
Office of the Dean	Requested clarity re: whether this was a
	new course or previously offered
Earth Sciences	
Mathematics and Statistics	Noted that pre-requisite "OR relevant experience/interest" could result in a large number of pre-requisite waivers. This resulted in department of Psychology modifying the pre-requisite.
Ocean Sciences	
 Physics and Physical Oceanography 	

Email requesting consultation:

From: Psych Deputy Head [mailto:psychdeputyhead@mun.ca]Sent: Friday, October 25, 2019 11:54 AMSubject: Proposed Calendar changes from Psychology

Hi,

The Psychology department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major requirements

- 2. Removing Math 1001 requirement for BHNR major
- 3. Update to the wording of BHNR honours requirements
- 4. Change to the way honours theses are graded
- 5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

6. Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

Please send your comments on these proposals to psyugradadvice@mun.ca.

Thanks,

Christina

Christina Thorpe Deputy Head, Undergraduate Studies Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>psychdeputyhead@mun.ca</u>

Office of the Dean of Science:

From: Christina Thorpe < <u>cthorpe@mun.ca</u>>

Subject: Re: Proposed Calendar changes from Psychology

Date: October 28, 2019 at 8:57:01 AM NDT

To: "Associate Dean of Science (Undergraduate)" adsu@mun.ca

Hi Travis,

Sorry for the confusion. I think that Psychology does our selected topics differently than other departments. We have a Selected Topics course called PSYC 4750 that is taught at least once per year. The past few times that Carolyn Walsh has taught it, this has been what she has covered. So in that sense, yes it has been taught before. However, when other instructors teach 4750 they cover different topics.

We will still need to offer PSYC 4750 in addition to this new course. So in this sense, it is a new course.

Christina

Christina Thorpe Associate Professor Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>cthorpe@mun.ca</u>

On Oct 28, 2019, at 8:51 AM, Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> wrote:

Hi Christina,

But in the rationale it states:

"This course is a broadening and regularization of a Selected Topics course that has been offered since 2016."

So I assumed it had been taught before.

Take care,

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE

(Administration & Undergraduate)

Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155

http://www.faculty.mun.ca/tfridgen/

From: Christina Thorpe <<u>cthorpe@mun.ca</u>>
Sent: Saturday, October 26, 2019 6:55 PM
To: Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>>
Subject: Re: Proposed Calendar changes from Psychology

Hi Travis,

This is a new course. It has not been offered before.

Christina

Christina Thorpe Associate Professor Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>cthorpe@mun.ca</u>

On Oct 25, 2019, at 7:11 PM, Associate Dean of Science (Undergraduate) <<u>adsu@mun.ca</u>> wrote:

Hi Christina,

This is about the 2740 proposal. What number was this offered under in the past?

Take care,

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE

(Administration & Undergraduate)

Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155

http://www.faculty.mun.ca/tfridgen/

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The use of PWD/PAS/FAL for the Honours thesis seems to us to be reasonable.

I am 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

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From: MIUG Consultations <MIUGconsultations@mi.mun.ca>
Sent: Friday, October 25, 2019 3:24 PM
To: Cathy Hyde <psyugradadvice@mun.ca>
Subject: RE: Proposed Calendar changes from Psychology

Hello,

Thank you for the opportunity to review and comment on the Calendar Change Proposals for Psychology. These will have no impact on Marine Institute programs and we support the proposals.

Regards,

Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

Math and Stats:

From: Hyde, Cathy
Sent: Friday, November 8, 2019 12:33 PM
To: 'mathconsult@mun.ca' <mathconsult@mun.ca>
Cc: 'Christina Thorpe' <cthorpe@mun.ca>
Subject: FW: Proposed Calendar changes from Psychology

Hi Tara,

Thanks for your feedback. Here are responses to your comments below:

2. 11.11.5.3 is a requirement for 2000-level courses so I don't think we want to include math 1001 at this time. I understand your concern for math minors, I'll include it as a discussion point for our undergraduate studies committee for future consideration.

4. Thanks for the insight, it is helpful to know what other departments are experiencing even if the cohorts are not directly comparable.

5. You bring up a good point. We will change the PR to be "...OR relevant experience" rather than "...OR relevant experience/interest"

Thanks,

Cathy Hyde, MSc | Manager of Academic Programs, MSc

Department of Psychology

Memorial University of Newfoundland

Tel: (709) 864-3059

www.mun.ca/psychology/

Begin forwarded message:

From: "Math Consult" <<u>mathconsult@mun.ca</u>>

Subject: RE: Proposed Calendar changes from Psychology

Date: October 25, 2019 at 2:12:33 PM NDT

To: cychdeputyhead@mun.ca

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 Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

No comment.

Regards,

Tara

Tara Stuckless

HH 3004, ext. 8914

Chair, Undergraduate Studies Committee

Dept. of Mathematics and Statistics

Pharmacy:

Hi Christina,

The School of Pharmacy has no concerns with the proposed changes, I don't believe they will affect our students or programs.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

Associate Professor

Memorial University School of Pharmacy

LIBRARY REPORT

------ Original Message ------Subject: RE: Proposed Calendar changes from Psychology Date: 2019-11-05 19:42 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: Cathy Hyde <<u>psyugradadvice@mun.ca</u>> Calendar changes 1 - 4, and 6 will have no impact on library resources.

The library has sufficient resources to support proposal 6. Dog behaviour has been an active research area at MUN for some time, and our collection in this area is consequently well-developed. As well as an unlimited user perpetual access copy of the required text, the books and chapters related to dog and animal behaviour in the PsycBooks collection will also provide many options for supplemental reading.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

RESOURCE IMPLICATIONS

A current faculty member will teach the course. As there was a new faculty member in this area hired in 2018, there will be no barriers to offering all currently offered Animal Behaviour courses in addition to this course, which will likely attract not only Science students, but also those from other Faculties.

A TA will be required for this course.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

1

Outline:

Week 1	Introduction
Week 2	Domestication
Week 3	Development- Becoming a Dog
Week 4	Dog Social Behaviour & Communication
Week 5	Social Cognition and Emotion in Dogs
Week 6	Learning in Dogs: Training Methods
Week 7	Applied Animal Behaviour
Week 8	Canine Aggression & Other Issues

Week 9	Human-Animal Interaction
Week 10	Welfare Issues
Week 11	Cross-cultural Perspectives on dogs
Week 12	Dogs in the Ecosystem
Week 13	Epilogue

Evaluation will consist of Quizzes (50%) a Final Exam (35%), and Assignment (15%).

Required Text and Course Materials :

Serpell, J. (2017). **The Domestic Dog: Its Evolution, Behavior, and Interactions with People** (2nd edition). New York: Cambridge University Press. ISBN: 978-1-107-69934-2

Instructor would be Carolyn Walsh initially, eventually other Psychology faculty specializing in animal behaviour would teach the course as well.

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:

- \boxtimes New course(s):
- \Box Amended or deleted course(s):
- \Box 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

Psychology 2505: Planning for a Successful Career in Psychology I Psychology 3505: Planning for a Successful Career in Psychology II Psychology 4505: Planning for a Successful Career in Psychology III

ABBREVIATED COURSE TITLE

Plan Success Career Psyc I Plan Success Career Psyc II Plan Success Career Psyc III

RATIONALE

Based on informal feedback, psychology students would appreciate more guidance in career and professional development. Within our Psychology Department Exit survey we found the vast majority of students would like additional assistance provided by the Department on career planning. A number of students also requested additional advice on graduate and professional endeavours beyond undergraduate studies. As a side note we are also unable to meet the demand for the psychology co-op program – in 2018, we had 21 students apply for one of six spaces. Therefore, we would like to create a course on psychology careers to help meet this need. Specifically, we would like to develop a series of three 1-credit hour courses that would be taken in each of second, third, and fourth year by interested psychology and behavioural neuroscience majors. These courses would be created in consultation with Student Life and take advantage of some of their pre-existing programs (e.g., the Volunteer Incentive Program).

Students are typically accepted into the psychology/behavioural neuroscience major in second year. At this point they would take the first course (PSYC 2505) which will be focused on careers within psychology. In third year, they would take PSYC 3505 which would focus on helping students gain skills necessary for entering the workforce (e.g., resume/CV workshops, identifying gaps in their resume and brainstorming ways to complete these gaps, networking, preparing for interviews, leadership skills). And finally in fourth year, students would take the capstone course (PSYC 4505) which would involve reflection on the competencies that they have gained through their course work and extracurricular activities, as well as preparation for entering the workforce or applying for post graduate programs.

CALENDAR CHANGES

Psychology 2505 Planning for a Successful Career in Psychology I provides an introduction to careers in psychology and the education/training required for these careers.

<u>CH: 1</u>

PR: Admission to a Major in Psychology or Behavioural Neuroscience

Psychology 3505 Planning for a Successful Career in Psychology II helps students identify and gain skills necessary for entering the workforce and/or apply for post-graduate degrees. Topics may include resume/CV writing, identification of gaps in resume/CV, networking, interview preparation, leadership skills, time management skills, stress management skills.

<u>CH: 1</u>

PR: PSYC 2505 or permission of the instructor

Psychology 4505 Planning for a Successful Career in Psychology III provides an opportunity for students to reflect on the competencies gained through course work and extracurricular activities. Topics may also include how to apply for graduate programs and scholarships/grants and preparation for entering the workforce. CH: 1 PB: PSYC 3505 or permission of the instructor

PR: PSYC 3505 or permission of the instructor

CALENDAR ENTRY AFTER CHANGES

Psychology 2505 Planning for a Successful Career in Psychology I provides an introduction to careers in psychology and the education/training required for these careers.

CH: 1

PR: Admission to a Major in Psychology or Behavioural Neuroscience

Psychology 3505 Planning for a Successful Career in Psychology II helps students identify and gain skills necessary for entering the workforce and/or apply for post-graduate degrees. Topics may include resume/CV writing, identification of gaps in resume/CV, networking, interview preparation, leadership skills, time management skills, stress management skills.

CH: 1

PR: PSYC 2505 or permission of the instructor

Psychology 4505 Planning for a Successful Career in Psychology III provides an opportunity for students to reflect on the competencies gained through course work and extracurricular activities. Topics may also include how to apply for graduate programs and scholarships/grants and preparation for entering the workforce. CH: 1

PR: PSYC 3505 or permission of the instructor

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Consultations Sought From	Comments Received	
Academic Advising Centre		
Humanities and Social Sciences		
Education		
Engineering and Applied Science	Supports the proposed change	
Grenfell Campus (Arts & Social Sciences)		
Human Kinetics and Recreation		
Library	No impact on Library resources	
Marine Institute	Supports the proposed change	
Pharmacy	No concerns	
Social Work	Supports the proposed change	
Science		
Biochemistry		
Biology		
Chemistry		
Office of the Dean	Question re: whether these courses	
	would be required for the major	
Earth Sciences		
 Mathematics and Statistics 	Reviewed, no comment	
Ocean Sciences		
Physics and Physical Oceanography		

Email requesting consultation:

From: Psych Deputy Head [mailto:psychdeputyhead@mun.ca] Sent: Friday, October 25, 2019 11:54 AM Subject: Proposed Calendar changes from Psychology

Hi,

The Psychology department is proposing a set of calendar changes. Please find attached a set of proposals outlining the following changes:

1. Expanding the 2000-level lab course subjects which are acceptable to meet Psychology major

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Please send your comments on these proposals to <u>psyugradadvice@mun.ca</u>.

Thanks,

Christina

Christina Thorpe Deputy Head, Undergraduate Studies Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: <u>psychdeputyhead@mun.ca</u>

Office of the Dean of Science:

From: Christina Thorpe <<u>cthorpe@mun.ca</u>>

Subject: Re: Career Development Courses

Date: October 28, 2019 at 3:08:27 PM NDT

To: "Fridgen, Travis" < tfridgen@mun.ca>

Hi Travis,

The plan is that these would be optional courses. They will not be required for the majors in either Psychology or Behavioural Neuroscience.

Christina

Christina Thorpe Associate Professor Psychology Department Memorial University of Newfoundland St. John's, NL, A1B 3X9 phone: 709-864-4806 fax: 709-864-2430 e-mail: cthorpe@mun.ca

On Oct 28, 2019, at 1:27 PM, Fridgen, Travis <<u>tfridgen@mun.ca</u>> wrote:

Hi Christina,

Are these going to be required courses for majors in Psychology courses?

Take care,

Travis

DR. TRAVIS FRIDGEN | ASSOCIATE DEAN OF SCIENCE

(Administration & Undergraduate)

Professor of Chemistry Memorial University St. John's, NL , Canada A1B 3X7 T 709-864-8155

https://www.mun.ca/faculty/tfridgen

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I am 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

Library:

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Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

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Bev

Bev Fleet

Chair, Undergraduate Studies Committee

Marine Institute, Memorial University

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Date: October 25, 2019 at 2:12:33 PM NDT

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No comment.

4. Change to the way honours theses are graded

Compared to our honours performance, I would think that 10% of students getting PWD is very small – but I know you have a very different cohort, and a lot of honours students. I think direct comparisons between our two units in this matter is not useful.

5. Addition of a new course (PSYC 2740: Domestic Animal Behaviour)

This title is very attractive, and I think would attract a lot of interest. I'm confused about the prerequisite – if a student has no interest in animal behaviour then they would likely not take this course. Since desire to register would signal a relevant interest, should this course have no prerequisite requirements other than the recommendation of Psyc 1000? It will become a nuisance to the instructor to have to grant the PR waivers.

 Addition of three new one credit hour courses (PSYC 2505: Planning for a Successful Career in Psychology I, PSYC 3505: Planning for a Successful Career in Psychology II, PSYC 4505: Planning for a Successful Career in Psychology III)

No comment.
Regards,

Tara

--

Tara Stuckless

HH 3004, ext. 8914

Chair, Undergraduate Studies Committee

Dept. of Mathematics and Statistics

Pharmacy:

Hi Christina,

The School of Pharmacy has no concerns with the proposed changes, I don't believe they will affect our students or programs.

Erin

--

Erin Davis, PharmD

Associate Dean Undergraduate Studies

Associate Professor

Memorial University School of Pharmacy

LIBRARY REPORT

------ Original Message ------Subject: RE: Proposed Calendar changes from Psychology Date: 2019-11-05 19:42 From: "Ambi, Alison" <<u>aambi@mun.ca</u>> To: Cathy Hyde <<u>psyugradadvice@mun.ca</u>>

Calendar changes 1 - 4, and 6 will have no impact on library resources.

The library has sufficient resources to support proposal 6. Dog behaviour has been an active research area at MUN for some time, and our collection in this area is consequently well-developed. As well as an unlimited user perpetual access copy of the required text, the books and chapters related to dog and animal behaviour in the PsycBooks collection will also provide many options for supplemental reading.

Alison Ambi

Head, Collections Strategies

Subject Librarian for Computer Science, Earth Sciences, Mathematics & Statistics, Physics, Psychology

RESOURCE IMPLICATIONS

We have three new faculty members who will be coming off their teaching remissions. It is expected that with these faculty members being brought up to full course load that we will be able to offer these professional development courses as part of load. Because each of these courses is only 1 credit hour, each course would count for 1/3 teaching credit.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

See below.

Psychology 2505: Planning for a Successful Career in Psychology

Sample Syllabus

Instructor: Christina Thorpe

Course Summary

Psychology 2505 Planning for a Successful Career in Psychology I provides an introduction to careers in psychology and the education/training required for these careers.

Please note that this is a 1-credit hour course. Students may want to consider taking PSYC 3505 and 4505 in future semesters to make up three credit hours. This is a pass/fail course.

Course Requirements

Text: Norris, M. E. (Ed.). (2019). *The Canadian Handbook for Careers in Psychological Science*. Kingston, ON: eCampus Ontario. Licensed under CC BY NC 4.0.

Course Objectives

- Students will learn about careers in different areas of psychology and the training required to pursue these careers.
- Students will learn time- and stress-management techniques.
- Students will learn about research ethics.

Course Format and Evaluation

Class will be held for one hour per week. Each week we will discuss careers in a particular area of psychology. We will try to include guest speakers from each area as much as possible. Each week students will be expected to do a short mini-assignment. These mini-assignments can consist of short reflection pieces, interview questions for guest speakers, or short summaries of topics. There will be 12 of these throughout the semester and students will need to complete a minimum of 10 to pass the course.

In addition to the mini-assignments, students will need to complete 5 informational interviews with people in a psychology related profession. Short summaries of these interviews will be posted on the class BrightSpace page for classmates to read and comment on.

The Canadian Handbook for Careers in Psychological Science

- Open-access resource for students in psychology;
- Assisting students in psychology with identifying how to translate their training into their next career steps;
- Grounded in the Canadian context, written by experts across Canada

Identifying many ways in which students trained in psychology are uniquely suited to lead initiatives aiming to solve many global challenges

Content: Edited by Meghan Norris, PhD, Queen's University Chapter 1: An Introduction to Careers in the Psychological Sciences By Meghan Norris & Tyson Baker Chapter 2: Careers in Psychology By Cathy Keates & Miguel Hahn Chapter 3: Research Methods in the Psychological Sciences By Thomas I. Vaughan-Johnston, Leandre R. Fabrigar, & Katie Glatt Chapter 4: The Essence of Ethics for Psychologists and Aspiring Psychologists By Cannie Stark Chapter 5: Clinical Psychological Science By Meredith L. Chivers, Christopher Bowie, Su Buchanan, Tess Clifford, Julie Goodman, Lindy Kilik, Martin Logan, Caroline Pukall, & Michael C. Seto Chapter 6: Applications and Careers for Counsellors and Counselling Psychologists By William A. Borgen & Roberta A. Neault Chapter 7: Social Psychology By Tara K. MacDonald, Valerie Wood, & Erica Refling Chapter 8: Developmental Psychology By Valerie Kuhlmeier, Kyla Mayne, & Wendy Craig Chapter 9: Neuroscience and Careers By John Stead, Alex Wiseman, & Kim Hellemans Chapter 10: Industrial/Organizational Psychology By E. Kevin Kelloway Chapter 11: Psychology and the Law in Canada By Steven M. Smith, Marguerite Ternes, Skye Stephens, & Katelynn Carter-Rogers Chapter 12: Sport Psychology By Lori Dithurbide, Poppy DesClouds, Kylie McNeill, Natalie Durand-Bush, Christina DeRoo, & Sommer Christie

Chapter 13: Community Psychology By Liesette Brunson, Alexis Gilmer, & Colleen Loomis Chapter 14: Environmental Psychology By Cheuk F. Ng, Robert Gifford, Jennifer A. Veitch, & Lindsay J. McCunn



Psychology 3505: Planning for a Successful Career in Psychology II Sample Syllabus

Instructor: Christina Thorpe

Course Summary

Psychology 3505 Planning for a Successful Career in Psychology II helps students identify and gain skills necessary for entering the workforce and/or apply for post-graduate degrees. Topics may include resume/CV writing, identification of gaps in resume/CV, networking, interview preparation, leadership skills, time management skills, stress management skills.

Please note that this is a 1-credit hour course. Students may want to consider taking PSYC 2505 and 4505 in future semesters to make up three credit hours. This is a pass/fail course.

Course Requirements

No formal textbook is required for this course. Students will have weekly readings that will be posted on BrightSpace.

Course Objectives

- Students will identify and gain skills necessary for entering the workforce.
- Students will create a polished resume/CV.
- Students identify gaps in their resume/CV and brainstorm ways to fill in these gaps through professional development programs, course work, extracurricular activities, volunteering, and work experience.
- Student will prepare for practice interviews.
- Students will develop leadership skills.
- Students will practice time- and stress-management skills.

Course Format and Evaluation

Class will be held for one hour per week. Each week we will discuss skills and competencies required for careers in psychology-related fields. Each week students will be expected to do a short mini-assignment. These mini-assignments can consist of short reflection pieces, interview questions for guest speakers, or short summaries of topics. There will be 12 of these throughout the semester and students will need to complete a minimum of 10 to pass the course.

In addition to the mini-assignments, students will also be required to submit a resume/CV at the beginning of the semester and a revised resume/CV at the end of the semester. They are also required to complete the Bronze level of the Volunteer Incentive Program (20 hours). More information about this program can be found at

https://www.mun.ca/volunteer/Student_Volunteer_Bureau_Programs/Volunteer_Incentive_Program.

Psychology 4505: Planning for a Successful Career in Psychology III Sample Syllabus

Instructor: Christina Thorpe

Course Summary

Psychology 4505 Planning for a Successful Career in Psychology III provides an opportunity for students to reflect on the competencies gained through course work and extracurricular activities. Topics may also include how to apply for graduate programs and scholarships/grants and preparation for entering the workforce.

Please note that this is a 1-credit hour course. This is a pass/fail course.

Course Requirements

No formal textbook is required for this course. Students will have weekly readings that will be posted on BrightSpace.

Course Objectives

- Students will reflect on how their coursework and extracurricular activities prepares them for postgraduate degrees and the workforce.
- Students will learn about how to apply for scholarships and grants for post-graduate degrees (e.g., tri-council funding)
- Students will feel confident with their applications for post-graduate programs
- Students will have a strategy in place for how to search for positions in their interested careers.
- Topics may also include how to apply for graduate programs and scholarships/grants, and preparing to entering the workforce.
- Students will continue to polish their resume/CV
- Students will continue to develop leadership skills.
- Students will continue to practice time- and stress-management skills.

Course Format and Evaluation

Class will be held for one hour per week. Each week we will discuss skills and competencies required for careers in psychology-related fields. Each week students will be expected to do a short mini-assignment. These mini-assignments can consist of short reflection pieces, interview

questions for guest speakers, or short summaries of topics. There will be 12 of these throughout the semester and students will need to complete a minimum of 10 to pass the course.

Students will also need to complete 4 smaller assignments throughout the semester. Students will choose which assignments they would like to do based on their post-graduation plans. For example, students interested in attending a research based graduate program may choose to do a tri-council Graduate Scholarship proposal. Students interested in entering the workforce may chose to do a cover letter for a job that they are interested in applying for. This will provide students with an opportunity to receive feedback on these.

And finally at the end of the semester students will be required to write a reflection piece on the skills and competencies acquired throughout their degree.



Faculty of Science Department of Mathematics and Statistics Department of Computer Science

Proposal for the new graduate programme 'Master of Data Science'

Name of the programme: MASTER OF DATA SCIENCE

Degree name in short form: MDSc

Academic units offering the programme: FACULTY OF SCIENCE, IN PARTICULAR, THE DEPARTMENTS OF COMPUTER SCIENCE AND MATHEMATICS & STATISTICS

Administrative home of the programme: FACULTY OF SCIENCE

Proponents: DRS YUANZHU CHEN (cs-chair@mun.ca) AND J C. LOREDO-OSTI (math-head@mun.ca) Tentative start of the programme: FALL 2020

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Appendix F. Consultation

Executive summary

This proposal calls for the creation of the Master of Data Science programme in the Faculty of Science at Memorial University. Data is the gold of our times. The ever-increasing generation of data has made data science one of the most sought-after professions for the 21st Century. Given the expected and accelerated growth for the profession in the next decades, the development of data science programmes has become a priority for almost all major universities. The proposed programme is in direct alignment with the strategic goals of the University regarding information and communication technologies. The proposed data science programme has been designed with an internationally recognisable curriculum. It focuses on the fundamental aspects of the field, and it is aimed to attract local, national and international students who want to break into this emerging area. The establishment of the proposed data science programme is not only timely but will also put Memorial University at the lead amongst the Atlantic Canada universities.

I Description of the programme

The proposed Master of Data Science programme is a new professional Master's programme designed by combining expertise from the departments of Computer Science and Mathematics & Statistics. It is a one-year programme aiming to equip the students with the foundations of data science and providing them with the practical techniques needed to effectively translate data into knowledge, communicate the findings, and help in the decision-making process.

1.1 Name of the programme

The proposed name for the new programme is **Master of Data Science** (MDSc). The *Faculty of Science* will offer this programme, and the core courses will be administrated by the departments of *Computer Science* and *Mathematics & Statistics*.

1.2 Profile of a graduate and learning outcomes

The objective of the proposed MDSc programmes is to provide the students with the knowledge that will allow them to develop the skills for quantitative thought leadership. The curriculum does not only address the foundations and applied techniques of the discipline but also includes aspects of communications and public policy, as well as the ethical and legal facets of data analytics.

1.3 Training

A student admitted to the MDSc programme will be exposed to advanced methods in optimisation, modelling, statistics, machine learning and artificial intelligence in an interdisciplinary context.

1.4 Key learning outcomes

By completing the proposed MDSc programme, it is expected that a graduate shall be able to:

- Develop an in-depth understanding of data science methods and techniques in predictive modelling, machine learning, artificial intelligence, data visualisation, and mining of big data.
- Build the skills to explore, analyse, and visualise data sets, regardless of their size, using the latest technologies.
- Apply data science and analytical methods to address data-rich problems from a variety of fields, think critically about data, and drive decision-making.

A graduate from this programme will rightly call himself/herself a data scientist and will be a professional equipped with a diverse and wide-ranging skill-set to gather vast amounts of data to analyse and synthesise the information into new knowledge and/or actionable plans. In today's data and information technology-oriented society, data scientists have evolved at the forefront of the data revolution.

1.5 Requirements for admission

Admission will be competitive. The Chair of the Programme in concurrence with Graduate Studies committees of the departments of Computer Science and Mathematics & Statistics will oversee the admission process to ensure that the proper policies and regulations are followed and the best candidates offered admission. The programme is open to applicants from a wide range of undergraduate backgrounds. The minimum requirements are:

- I. In addition to the regulations outlined in Section 4 (General regulations) of the School of Graduate Studies Calendar, the applicants shall hold minimum a second class 4-year bachelor's degree in a relevant area. The applicant is required to provide evidence of at least one college-level course or equivalent knowledge in multivariate calculus, statistical inference and computer programming in a high-level programming language, like R, Python, C, C++, Java, etc.
- 2. It is the responsibility of applicants who are admitted to the programme to complete three online non-credit propaedeutic courses before the starting of the programme. These courses cover the essentials of statistical inference, programming in R or Python, and linear algebra. Once an acceptance letter is issued and the admission fee payment is made, the course materials as well as self-evaluation tools will be made available through Brightspace.
- 3. Applicants are required to meet the English Proficiency requirements described under the Section 4 (General Regulations), Subsection 4.1.5 (English Proficiency Requirements) of the School of Graduate Studies Calendar.

1.6 Programme overview

The proposed graduate programme is interdisciplinary and data driven. The programme consists of five core courses, two elective courses plus a capstone colloquium and a project. The duration of the programme is one year. The proposed mandatory courses are:

STAT-6519	Regression models
STAT-6559	Statistical exploration of data
DSCI-6601	Practical machine learning
DSCI-6602	Deep learning and artificial intelligence
DSCI-6607	Programmatic data analysis using R and Python
DSCI-6690	Data science case study series
DSCI-695A/B	Capstone project

There will be great flexibility for the two elective courses, and ideally, they will be connected to the data science project. This flexibility opens the door and welcomes the participation of other academic units. The two elective courses can be chosen from the following list of existing courses. This list will be modified and extended as more interested faculties / departments join the programme.

COMP-6907	Data mining techniques and methodology
COMP-6908	Database technology and applications
COMP-6917	Complex networks
MATH-6100	Dynamical systems
MATH-6201	Numerical methods for time-dependent differential equations
MATH-6202	Nonlinear and linear optimisation
MATH-6204	Iterative methods in numerical linear algebra
MATH-6210	Numerical solutions of differential equations
MATH-6351	Advanced linear algebra
STAT-6503	Stochastic processes
STAT-6505	Survival analysis
STAT-6530	Longitudinal data analysis
STAT-6545	Computational statistics
STAT-6561	Categorical data analysis
STAT-6563	Sampling theory
STAT-6564	Experimental designs
STAT-6571	Financial and environmental time series
STAT-6573	Statistical genetics
MED-6260	Applied data analysis for clinical epidemiology
MED-6278	Advanced biostatistics for health research
BUSI-8025	Information systems
BUSI-9021	Data management
BUSI-9022	Information systems analysis and design
BUSI-9912	Probabilistic models

The data science case study series seminar is designed as a set of modules or topics focused on specific applications of data science in biology, physics, engineering, health sciences, business and social sciences.

For the capstone project, the students and advisers will be encouraged to find an industry or public sector partner whenever possible.

1.7 Delivery model

All core courses will be delivered by the departments of Computer Science and Mathematics & Statistics. All courses are designed such a way that students will have exposure to the data generating mechanism, understanding how data are collected, how it can be analyzed and interpret the results. The proposed course offering is listed below term-wise, which are developed based on the need for subsequent courses as well as balanced workload for successful completion of the program on time.

Fall Term:

STAT-6519	Regression models
DSCI-6601	Practical machine learning
DSCI-6607	Programmatic data analysis using R and Python

Winter Term:

STAT-6559	Statistical exploration of data
DSCI-6602	Deep learning and artificial intelligence
DSCI-6690	Data science case study series
DSCI-695A	Capstone project
	Electives 1 and possibly 2

Spring Tem:

DSCI-695B	Capstone project
	Elective 2, if not done before

2 Statement of justification

2.1 Introduction

Data science is considered one of the most important, if not the most, professions of the 21st century. With our lives lived increasingly online, almost everyone leaves behind a data trail that is hailed as the gold of the digital age. With the increased generation of data, there is an ever-increasing demand for specialists being able to structure, analyse and process this data, which is done by data scientists. Given the continuing demand for data scientists, and the expected accelerated growth of this profession over the next few decades, the development of a data science degree has been a top priority for virtually any major university in North America, Australia and New Zealand. The development of a data science degree

programme at Memorial University is therefore especially timely.

2.2 Rational and demand for the programme

As highlighted in the introduction, recent years have seen accelerated growth in demand for data scientists. The United States of Labor Statistics estimates a growth of employment of computer and information research scientists by 19% by the year 2026, surpassing the growth of almost any other profession. Various job engines report an increase in demand for data science jobs by close to 30% over the last year alone, and several hundred per cent by the mid 2010's. Given that data science jobs are also on average extremely well-paid, with salaries averaging around \$100,000, and taking into account that IT-based jobs in Canada currently have a less than 1% unemployment rate, there is a pressing demand by students from various undergraduate backgrounds to enter this domain. The proposal of a course-based master in data science at Memorial University is a response to the rapid developments of this field. With data science being an exceptionally interdisciplinary field it is worth mentioning that Memorial University already has considerable research expertise in data science, distributed amongst the department of Computer Science and Mathematics & Statistics. Several other departments, including Engineering, the Health Sciences, Ocean Science and Biology also house data science expertise. The consolidation of this expertise in a master programme in data science is thus natural. Existing jobs in data science, being a relatively young discipline, have been filled by university graduates and self-taught experts from various backgrounds. The most common backgrounds of data scientists are mathematics and statistics, computer science, engineering and physics, with most of them being highly educated having either masters or doctorate degrees. The creation of a dedicated masters programme in data science can, therefore, be seen as a timely approach for structuring the training of the next generation of data science professionals. Since the proposed course-based MDSc programme aims at attracting undergraduate students from the aforementioned backgrounds, we do expect to be able to offer a promising programme for local, national and international students that want to break into this emerging area.

2.3 International and national comparison of related programmes and unique attributes

For the last few years, Glassdoor, the internet job search agency, ranked the job of a Data Scientist as #1. The Harvard Business Review called data science "The Sexiest Job of the 21st Century". Data science is now used as a buzzword, being often applied to business analytics, subsuming the arbitrary use, extraction or manipulation of data, and it is also used as stand-alone field related to statistics and computer science. Since a few years, several major universities around the world have started programmes in data science with a broad interpretation of the definition of the term data science and a wide variety of curricula, some focusing more on the applications of this field to specific data types, others being centred more on the mathematical and computational fundamentals. Depending on the focus of the programme, data science graduate degrees are offered from departments of mathematics and statistics, computer science, business, economics, or the health sciences. Many such programmes are offered as a specialisation of existing programmes in computer science, applied mathematics and statistics, and business analytics. Given the rapid development in the field of data science, which is only expected to accelerate over the coming decade, we

propose a data science graduate programme that is heavily centred on the mathematical, statistical and computational fundamentals of this field. In proposing a programme that is focused on the fundamental aspects of this field rather than specific types of data or areas of applications, it is believed that our prospective students will be appropriately prepared for the ever-evolving jobs market. Canadian universities began offering data science undergraduate and graduate programmes in 2018. There are presently 20 universities and colleges offering masters (or diplomas and certificates) in data science or related areas. Amongst the top universities, there are the University of British Columbia (UBC), University of Waterloo (UW) and University of Toronto. The duration of the UBC Master of Data Science programme is only 10 months whereas the UW programme is 16 to 24 months, with a thesis. The diploma programme at the University of Calgary has a duration of 8 months. Amongst the Atlantic universities, Saint Mary's University offers a masters in Computing & Data Analytics programme (16 months), which can be considered as a data science related programme. Memorial University, being a leader of Atlantic universities, is in the unique position of offering a Master of Data Science in which students can apply the fundamental techniques learned in the programme to various data from bio-medical sources, engineering, oceanography, the marine environment and the physical sciences. Therefore, our programme will give students the opportunity to expose their skills to real data sourced from a wide variety of areas and fields.

2.4 Contribution to strategic goals of the University

Memorial University's Strategic Research Plan's section "Information and Communications technology" specifically lists "managing (storing, retrieving, filtering, and processing) the vast amounts of data collected by businesses and other organisations using web-based and sensor-based data collection (data collection includes scientific, health, pharmaceutical, commercial, geographic, and social network data, remote sensing, communication networks, information technologies, and computational modelling" which is essentially a description of data science. The formation of a data science masters programme is thus directly in line with the strategic goals of the university.

3 Market analysis

Unofficial reports / information from our colleagues from Canadian universities that introduced data science undergraduate and graduate programmes indicated the application for enrolment to be very high. The industrial support in terms of participation in the programmes directly as well as recruitment of prospective graduates is considered as high as well. It is thus reasonable to expect considerable demand for our programme as well, in particular since the special fees for existing programmes at other Canadian universities are much higher than the expected fees for our program. Additionally, once established, Memorial University will be the first Atlantic university introducing a data science programme focusing on the fundamental aspects of this field with a curriculum that is internationally recognisable. Moreover, many Atlantic government agencies or companies began to shown interest in using data science methodologies, especially the Vale Group, Verafin and Eastern Health (from NL) amongst several other companies and agencies in NS and NB (Medicare in NB; as identified during the AARMS Industrial Problem Solving Workshop in July 2019). We have started a few encouraging discussions with several of these companies, and all have shown considerable interest in a data science programme at Memorial University (letters of support will be provided at a later point). Further discussions will be continued in the fall of 2019.

4 Resource implications

The Faculty of Science, in particular, the departments of Mathematics & Statistics and Computer Science, has the teaching and research expertise relevant to the core components of data science. A large volume of research involving data science is conducted in the faculty and many faculty members have developed expertise that can contribute to the success of the programme. In fact, there is a great interest in data science in almost all academic units of the university and, consequently, the expertise for specific applications of data science is being developed in many places; this can be used to enrich the programme through the case study series and capstone project as well as enlarging the pool of elective courses.

In terms of office space, the Department of Mathematics & Statistics is in a precarious situation right now and it will need the support of the University and the Dean of Science to overcome this limitation. The programme requirements of software will be minimal because it will rely heavily on R and Python, and other open-source resources. However, students still need access to high performance computing facilities and, depending upon enrolment, the department's computer lab facilities may be overwhelmed. Should such an eventuality arise, a portion of the generated revenue would need to be directed to address this. Meanwhile, some alternatives have been sought. For example, the Centre for Health Informatics and Analytics of the Faculty of Medicine hosts a cluster with big data analysis capabilities, and students whose adviser holds an affiliation with the Faculty of Medicine may be granted access to the computing resources.

Various members of the departments of Computer Science and Mathematics & Statistics involved in the *Data Science Research Group* (https://www.mun.ca/math/dsci/) are planning to submit funding requests to suitable infrastructure grants (such as CFI), from which a small scale GPU enabled computing cluster should be purchased. The availability of GPU and TPU architectures is a crucial aspect for data science, and as such a valuable resource that will ideally be in place for the students of this program. Funding contributions from the university for either purchasing and/or upkeep of such critical infrastructure would be desirable.

4.1 Existing faculty resources

Below a list of faculty members with teaching and research expertise relevant to the core components of data science is provided.

- 1. Jahrul Alam. Adaptive wavelets in atmospheric turbulence, large eddy simulation, down-scaling in meteorology, oil and gas, geophysical fluid dynamics, computational science.
- 2. Alex Bihlo. Deep learning, neural networks, Monte Carlo methods, numerical differential equations, geometric numerical integration, geophysical fluid mechanics, meteorology.

- 3. Sharene Bungay. Genetic algorithms, mathematical modelling, numerical methods, optimisation techniques, physiological systems, computational chemistry, dynamical systems.
- 4. Yuanzhu Chen. Complex networks, computer networking, online social networks, mobile computing, graph theory, web information retrieval, and evolutionary computation.
- 5. **Candemir Cigsar**. Time-to-event and event history, recurrent events, multistate modelling, sample design, biostatistics, system reliability, statistical genetics, incomplete data and goodness-of-fit.
- 6. **Zhaozhi Fan**. Heavy tailed distributions, measurement error, longitudinal categorical data, high frequency and high dimensional data, free probability, quantile regression, financial time series.
- 7. Armin Hatefi. Classification, clustering, complex data and mixture models, non-parametric and semi-parametric models, machine learning, computational statistics, big data, Bayesian statistics.
- 8. **Ronald Haynes**. Numerical analysis and scientific computing for partial differential equations (moving mesh, domain decomposition, and parallel methods in time) and linear algebra, optimisation.
- 9. J C. Loredo-Osti. Time series, extreme values, statistical genetics, genomics, Monte Carlo methods, dimension reduction, regression trees, neural networks, applied stochastic processes, inference.
- 10. **Scott MacLachlan**. Numerical analysis and scientific computing, high-performance computing, numerical linear algebra, multigrid, finite-element and parallel-in-time methods, fluid dynamics.
- 11. George Miminis. Scientific computing, numerical methods in control engineering, numerical methods for vector and parallel architectures.
- 12. Lourdes Peña-Castillo. Development and/or application of artificial intelligence or machine learning in biomedical sciences, games, augmented virtuality, and methods to solve biological problems.
- 13. Hamid Usefi. Machine learning, feature selection, dimensionality reduction and various applications especially in genomics. Also interested in applications of deep learning in anomaly detection.
- 14. Asokan Variyath. Computational statistics, machine Learning, longitudinal data, variable selection, design of experiments, multivariate ordinal data.
- 15. **Hong Wang**. Markov processes, multi-parameter stochastic processes, martingales, order statistics, extreme values and related limiting distributions, model building, machine and deep learning.
- 16. **Deping Ye**. Asymptotic functional analysis, random matrices, compressed sensing, statistical models with measurement error, convex geometry, geometric analysis, quantum information theory.
- 17. **Yildiz Yilmaz-Cigsar**. Survival and event history analysis, statistical genetics, genetic epidemiology, incomplete data analysis, sampling designs, multivariate analysis, copula theory, causal inference.

Besides, the Department of Mathematics & Statistics is seeking the replacement of two faculty vacancies with tenure-tracked statisticians or data scientists. On the other hand, in the University, there is a considerable number of scientists whose activities may be considered within the realm of data science and their interaction/contribution with the programme will be gladly welcome. Outside of the Faculty of Science we have already initiated contacts to have an agreement of collaboration that includes delivery of elective courses and advising of students with with the Faculty of Medicine, the Faculty of Business and the Faculty of Engineering.

4.2 Additional teaching resources required

The proposed programme will use some of the existing courses offered in the departments of Mathematics & Statistics and Computer Science. However, it will require of 5 new courses, a case study series and a capstone project as well as the teaching time to offer a comprehensive selection of elective courses. In addition, faculty of the Faculty of Science advising students will be compensated with one-fourth of a course teaching remission once the student that they advise/supervise graduates. In the budget, we account for a number of units of extra teaching depending upon the enrolment.

4.3 Administration of the programme

The proposed Master of Data Science programme will be administered by the Dean of Science who will appoint a Scientific Chair. The Chair must work in conjunction with the department heads of Mathematics & Statistics and Computer Science or their representatives in all relevant matters concerning the programme. This group will meet regularly to deal with admissions, student progress reviews, changes to the curriculum and content, and review the regulations governing the programme.

5 Library holdings and/or resources required

The holdings at the Queen Elizabeth II Library, the Health Sciences Library, the C.R. Barrett Library (Marine Institute), and internet sources to which the university library system has access will be available to the students of the proposed programme. The QE-II Library has an extensive selection of statistics, mathematics and computer science books and access to technical journals that will be of benefit to the students in the programme. On this regard, there is no extra cost associated with the proposed programme. A request for assessing the library holding requirement is already submitted to the Queen Elizabeth II Library.

Appendix A. Calendar changes

The next two pages are a new entry in the School of Graduate Studies calendar section.

12. Regulations Governing the Degree of Master of Data Science

The Degree of Master of Data Science (MDSc) is a highly structured program incorporating 21 credit hours in courses, a case study series, and a capstone project. The Degree is offered in the departments of Computer Science and Mathematics & Statistics by full-time study.

12.1 Qualifications for Admission

Admission to the program is limited and competitive. The program is open to applicants from a wide range of undergraduate backgrounds. In addition to the regulations outlined in Section 4 (General regulations) of the School of Graduate Studies Calendar, the minimum requirements are:

- 1. To be eligible for admission to the Master of Data Science program, an applicant shall hold minimum a second class 4-year bachelor's degree in a relevant area.
- 2. The applicant is required to provide evidence of at least one college-level course or equivalent knowledge in multivariate calculus, statistical inference and computer programming in a high-level programming language, like R, Python, C, C++, Java, or Lisp.
- 3. Admission to the program shall be upon acceptance by the Dean of Graduate Studies after recommendation by the Chair of the Programme or either Head of the Departments of Computer Science or Mathematics & Statistics or delegate, along with a proposed program of study and a proposed academic adviser.

12.2 Program of Study

The minimum requirements for the Degree of Master of Data Science are the completion of the following:

- 1. The graduate courses DSCI 6601, DSCI 6602 DSCI 6607, STAT 6519, STAT 6559, plus two additional 3-credit hour courses from the list of Data Science Elective Courses or courses from other academic units approved by the Dean of Graduate Studies.
- 2. DSCI-6590 and DSCI-695A/B and a final project report. The report must demonstrate a satisfactory general mastery of data science knowledge.

12.3 Evaluation

1. In order to continue in graduate studies and in order to qualify for a Master's Degree, a student shall obtain an A or B for all regular program courses. In order to qualify for graduation, a student shall also pass DSCI 6590 and DSCI 698A/B and complete the final project report requirement successfully.

2. DSCI 695A/B progress after each semester will be evaluated by the student's academic adviser while the final applied data science project report will be evaluated by a faculty member other than the adviser appointed by either Head of the Departments of Computer Science and/or Mathematics & Statistics.

12.4 Courses

12.4.1 Data Science Required Courses

STAT-6519	Regression models
STAT-6559	Statistical exploration of data
DSCI-6601	Practical machine learning
DSCI-6602	Deep learning and artificial intelligence
DSCI-6607	Programmatic data analysis using Python and R
DSCI-6690	Data science case study series (2 credit hours)
DSCI-695A/B	Capstone project (2 credit hours)

12.4.1 Data Science Elective Courses

BUSI-8025	Information systems
BUSI-9021	Data management
BUSI-9022	Information systems analysis and design
BUSI-9912	Probabilistic models
COMP-6907	Data mining techniques and methodology
COMP-6908	Database technology and applications
COMP-6917	Complex networks
MATH-6100	Dynamical systems
MATH-6201	Numerical methods for time-dependent differential equations
MATH-6202	Nonlinear and linear optimisation
MATH-6204	Iterative methods in numerical linear algebra
MATH-6210	Numerical solutions of differential equations
MATH-6351	Advanced linear algebra
MED-6260	Applied data dnalysis for clinical epidemiology
MED-6278	Advanced biostatistics for health research
STAT-6503	Stochastic processes
STAT-6505	Survival analysis
STAT-6530	Longitudinal data analysis
STAT-6545	Computational statistics
STAT-6561	Categorical data analysis
STAT-6563	Sampling theory
STAT-6564	Experimental designs
STAT-6571	Financial and environmental time series
STAT-6573	Statistical genetics

Appendix B. New courses for approval

DSci-6601 Practical machine learning

Course description: This course provides a practical introduction to machine learning. The course will mostly focus on applying supervised learning methods to a variety of data-sets using R and Python. Model selection and assessment will be discussed and applied.

Prerequisites: None.

Tentative syllabus:

- I. Introduction to Machine Learning (ML)
 - (a) Definition
 - (b) Types of ML
 - (c) Supervised ML
 - i. Classification and regression
 - ii. Generalization, undefitting, overfitting, bias and variance
- 2. Introduction to scikit-learn
- 3. Introduction to caret package
- 4. Exploring, understanding and representing data
 - (a) Data exploration (recap)
 - (b) Data transformations
 - (c) Data encoding
 - (d) Feature selection
- 5. Model performance assessment
 - (a) Performance metrics
 - (b) Cross-validation
- 6. Supervised ML algorithms
 - (a) Nearest Neighbours
 - (b) Linear Models
 - (c) Naive Bayes Classifiers
 - (d) Ensembles of Decision Trees
 - (e) Support Vector Machines
 - (f) Feed forward neural networks

Textbooks:

• An Introduction to Statistical Learning: with Application in R. G. James, D. Witten, T. Hastie and R. Tibshirani. Springer, 2013. (https://www-bcf.usc.edu/ gareth/ISL/).

- Introduction to Machine Learning with Python: A Guide for Data Scientists. Sarah Guido, Andreas Müller. O'Reilly Media, 2016.
- Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition. Brett Lantz. Packt, 2019.

Evaluation Scheme:

Assignments (6) 60% Project 30% In-class participation 10%

DSci-6602 Deep learning and artificial intelligence

Course description: This course will provide a short overview of classical methods of machine learning before delving into the recent developments in the areas of deep learning, reinforcement learning, deep reinforcement learning and artificial intelligence.

Prerequisites: Undergraduate linear algebra at the level of Math-2050, multivariate calculus at the level of Math-2000 as well as elementary probability. Elementary experience with Python.

Tentative syllabus:

- 1. Review: Classical machine learning
 - (a) Least squares regression
 - (b) Logistic regression
 - (c) Autoencoders and matrix factorization methods
- 2. Deep neural networks and deep learning
 - (a) Multilayer perceptrons
 - (b) Gradient descent, optimization, backpropagation algorithms
 - (c) Convolutional neural networks
 - (d) Recurrent neural networks
 - (e) Stability of neural networks
 - (f) Applications to computer vision, natural language processing, time series analysis
 - (g) Computational considerations for training neural networks
- 3. Advanced topics in deep learning
 - (a) Variational autoencoders
 - (b) Generative adversarial networks and generative methods
 - (c) Adversarial examples
 - (d) Neural ordinary differential equations
- 4. (Deep) reinforcement learning and artificial intelligence
 - (a) ε -greedy algorithms
 - (b) Finite Markov decision processes

- (c) Temporal-difference learning
- (d) Function approximations for reinforcement learning
- (e) Policy gradient methods
- (f) Case studies (ATARI games, AlphaGo, autonomous vehicles)
- (g) Ethical questions and AI safety

Textbooks: The following books are either publicly available or available through our library.

- C.C. Aggarwal. *Neural Networks and Deep Learning*, Springer, 2018. (available as ebook in our library)
- 2 I. Goodfellow, Y. Bengio and A. Courville. Deep learning, MIT press, 2016. (available online)
- 8 R.S. Sutton and A.G. Barto. *Reinforcement learning*, MIT press, 2018 (available online)

Evaluation scheme: The suggested grading scheme for this course will consist of:

Assignments	15%	One assignment every 2-3 weeks, which includes both analytical and numer-
		ical components.
Final project	15%	Each student will prepare an individual final project consisting of a written
		report and an oral presentation, to be given on the last day of class, on a topic
		relevant to the course.
Midterm	30%	The midterm exam will be a one hour written exam.
Final exam	40%	The final exam will be a three hour exam, two hours of which will be a written
		exam and one hour will be a numerical lab component.

DSci-6607 Programmatic data analysis using Python and R

Course description:

R and Python have become the two most used programs by the data science community. Thus, any trainee in the discipline ought to be able to master the essentials of these languages, and this course is designed to provide the students with an opportunity to gain an insight of these programming languages in the context of data science.

Prerequisites: None.

Tentative syllabus:

- 1. Part I: R for data science
 - (a) Introduction to R software
 - (b) Data wrangling and visualization using tidyverse
 - (c) Basic programming: branching, looping, vector based programming, and program flow
 - (d) Libraries in R: download, usage, extracting the results, and basic libraries Stat and MASS
 - (e) Programming with functions and simulations
- 2. Part II: Python (including fundamentals of SQL)

- (a) Preliminaries
 - i. Python language basics
 - ii. iPython
 - iii. Jupyter notebooks
- (b) Built-in constructs
 - i. data structures
 - ii. functions
 - iii. file I/O
- (c) NumPy basics
 - i. ndarray: multidimensional array
 - ii. array-oriented programming (with Array)
 - iii. files I/O with arrays
 - iv. linear algebra support
- (d) pandas: basics
 - i. essential pandas data structures
 - Series, DataFrame, Index
 - ii. essential pandas functionality
 - reindexing, entry filtering, dimension selection, data alignment
 - function application, mapping
 - sorting and ranking
 - iii. descriptive statistics
- (e) pandas: data and file I/O
 - i. working with formats
 - text (CSV, JSON, XML) and binary (HDF5, Excel)
 - ii. Web API
 - iii. SQL databases
 - relational database fundamentals
 - SQL
 - interfacing with SQLite
- $(f) \hspace{0.1 cm} pandas: \hspace{0.1 cm} data \hspace{0.1 cm} handling$
 - i. data cleaning and preparation
 - missing and duplicate data
 - data transformation
 - ii. data wrangling
 - hierarchical indexing
 - combining data sets
 - reshaping and pivoting
 - iii. strings and regular expressions
- (g) Plotting and visualization
 - i. matplotlib: lower-level API
 - ii. pandas and seaborn: add-ons
- (h) Data aggregation and group operations with NumPy and pandas data types

- i. the groupby interface
- (i) Time series
 - i. date and time data types
 - ii. ranges, frequencies, and shifting
 - iii. time zones
 - iv. periods, resampling, and frequency conversion
 - v. moving-window functions
- (j) Categorical data

Textbooks:

- Scientific programming and simulations using R, by Jones, Maillardet and Robinson, 2008.
- **2** *R for Data Science* by Wickham and Grolemund, 2016.
- Python data science handbook: essential tools for working with data, by J Vanderplas, 2007.
- Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd ed., by Wes McKinney, O'Reilly Media, 2017, ISBN-10:1491957662.

Evaluation scheme:

Five assignments50%Two projects20%Final exam30%

DSci-6690 Data science case study series

Course description: This is a fundamental course to familiarise students with the application of data science to the different disciplines. The first week of the series will be devoted to ethics, law and public policy in data science; then, every other week an expert will be invited to present a case study (one or two 90-minute sessions) and the next two 90-minute sessions will be used to discuss the case. These discussions will be moderated by an 'in residence' faculty member involved in the programme. At the end of the discussion for each case study, the students write a report and build a portfolio.

Evaluations scheme: This is a pass/fail course based on attendance, participation, and the cases portfolio.

DSci-695A/B Capstone project

Course description: Students of the Master of Data Science are required to complete an application oriented project under the direction of their respective adviser. Students must register for this project the second and third semesters of the programme, and submit a final report to be evaluated by a faculty member other than the advisor.

Evaluations scheme: This is a pass/fail course based on the report.

Appendix C. Existing required courses

Stat 6519 Regression models

Course Description:Linear statistical inference and its applications are fundamental to all areas of applied statistics. This new course will cover the basic regression models which are frequently used in linear statistical inferences. It will provides a powerful kit of tools to the Master of Applied Statistics students for the success in their future career.

The course introduces simple and multiple linear regression, Gauss-Markov theorem and followed by residual analysis, tests of linear hypotheses, model building and regression diagnostics, analysis of variance and covariance and error-in-variable problems.

Tentative course outline

- 1. Simple and multiple linear regression, Gauss-Markov theorem.
- 2. Residual analysis.
- 3. Tests of linear hypotheses.
- 4. Model selection.
- 5. Regression diagnostics.
- 6. Analysis of variance.
- 7. Analysis of covariance.
- 8. Error-in-variable problems in regression models

Textbooks

- N. R. Draper, H. Smith. Applied Regression Analysis, John Wiley & Sons, Inc. New York, 1966.
- C. R. Rao. Linear Statistical Inference and Its Applications, 2nd edition, John Wiley & Sons, Inc. New York, 2001.
- O. A. Belsley, E. Kuh, R. E. Welsch. Regression Diagnostics—Identifying influential data and sources of collinearity, John Wiley & Sons, Inc. New York, 1980.
- J. P. Buonaccorsi. Measurement Error Models, Methods and Applications, Chapman & Hall/CRC, New York, 2010.

Stat 6559 Statistical exploration of data

Course Description: Because of the recent advancement of statistical applications in different areas, there a high demand for qualified professionals in the area of statistical techniques for data analytics and big data analysis. The proposed course deals with a set of multivariate techniques that explore the data visualization and identification of patterns in the data. This course will equip the students with statistical and computational skills for turning big data sets into meaningful insights that may help to achieve a proper

interpretation.

This course will first introduce multivariate random variable and multivariate normal distribution followed by multivariate likelihood ratio tests. Supervised learning methods such as linear discriminant analysis, logistic regression, neural networks, recursive partitioning and nearest neighbours will be included. Unsupervised learning methods that will include are principal component analysis, cluster analysis. Other topics includes are methods for data visualization of large data sets using software R.

Tentative course outline

- 1. Review of statistical estimation and testing of hypothesis.
- 2. Exploring Multivariate Data Graphical and Estimation of Parameters
- 3. Multivariate random variable, multivariate normal distribution.
- 4. Likelihood ratio statistics, Hoteling T^2 statistic, and Mahalanobis distance.
- 5. Unsupervised learning association rules, principal component analysis, cluster analysis.
- 6. Robust statistics
- 7. Anomaly detection methods
- 8. Data visualisation using R plotting large data sets, projection pursuit.

Textbooks

- An Introduction to Statistical Learning: With Applications in R by G James, D Witten, T Hastie, R Tibshirani, 2017.
- The applied multivariate statistical analysis, 6th ed, by RA Johnson and DW Wichern. Pearson, 2015.
- The elements of statistical learning by T Hastie, R Tibshirani, and J Friedman. Springer, 2009.

Appendix D. Existing elective courses

Busi-8205 Information Systems

Course Description: Information Systems: A survey of topics in information systems (IS) and information technology (IT) from a managerial perspective is provided. Topic areas include: IS roles in decision making, IS/IT-enabled competitive advantage, approaches to data management, software for end-user productivity, telecommunications, information processing technology, systems and applications software, systems design techniques and systems development methodologies.

Prerequisite: None.

Course materials:

The primary course material consists of readings assigned for each class during the semester. All readings are available online. Some readings are restricted resources available online only through resources provided by the Memorial University libraries. In order to access this material, you will either have to be on campus, or use the 'Access from Home' feature on the Memorial University Libraries page (http://www.library.mun.ca/usingthelibraries/accessfromhome/).

Busi-9021 Data Management

Course Description: This course is based on the principle that data is a valuable resource that needs to be managed effectively to provide accurate, complete, timely, relevant and accessible information to support decision-making. Topics include: enterprise data modelling, logical database design, database management systems, query languages, transaction management and security. **Prerequisite:** None.

Textbook:

• Jukić, Nenad, Susan Vrbsky, and Svetlozar Nestorov, (2017). Database Systems: Introduction to Databases and Data Warehouses, Prospect Press.

Busi-9022 Information systems analysis and design

Course Description: This course provides students with the skills to identify business problems that may be addressed using information technology, determine requirements for information systems and develop detailed designs that form the basis for implementing systems. Topics may include: role of the client in systems development, systems development life cycle, analysis and conceptual modelling, object-oriented analysis and design and trends in systems development methods.

Prerequisite: Completion of nine required courses including 8205 or permission from the instructor. **Textbook:**

• The following textbook is required: Systems analysis and design, 6 th Edition by Dennis, Wixom, and Roth.

Busi-9912 Probabilistic models

Course Description: This course is to introduce and study fundamentals of probability, decision analysis and stochastic programming; Markov models and geometric Brownian motion processes; queuing models; inventory theory; and simulation. Application of these models and theories to services, queuing systems and networks, inventory management and finance will be emphasized in the course. Each individual student will be required to select, research and present a topic, theoretical or application, on probabilistic models of business systems.

Prerequisite: None.

Texbooks:

- S.M. Ross Introduction to Probability Models, 9 th Edition (or newer), Elsevier 2007.
- **2** G. Grimmett and D. Stirzaker Probability and Random Processes, 3 rd Edition 2001.
- S.M. Ross An Introduction to Mathematical Finance, Cambridge University Press 1999.
- J.R. Birge, F. Louveaux Introduction to Stochastic Programming, Springer-Verlag 1997.
- L. Schrage Optimization Modeling with Lindo, 5 th Edition, Duxbury Press 1997.
- **6** L. Trigeorgis Real Options, The MIT Press 1996.

Comp-6907 Data mining techniques and methodology

Course Description: This course introduces common techniques and methodologies underlying knowledge discovery and data mining. It covers fundamental topics, as well as advanced materials that are of the major interests in the field. Both theoretical aspects and algorithmic approaches are described. The course is intended for the audiences who have limited exposure to the data mining/machine learning field, and are interested in gaining further knowledge and skills for practical applications.

Prerequisite: Graduate students with basic data mining knowledge who are interested in learning more advanced methodologies

Textbook:

• Data Mining: Concepts and Techniques, 3rd Ed., by Jaiwei Hon, Icheline Kember, and Jian Pei, Morgan Kaufmann Publishers, ISBN 978-0-12-381479-1, 2012.

Comp-6908 Database technology and applications

Course Description: The course will cover several current topics related to database and information retrieval applications. Topics include: Review of database design and relational databases; Transaction concepts, concurrency control and recovery methods; Homogeneous and heterogeneous distributed database systems; Workflow management systems; Mobile database systems; Web services; and Data Management in a Cloud.

Prerequisite: Knowledge in database systems

References:

- Gerhard Weikum and Gottfried Vossen. Transactional Information Systems, Theory, Algorithms, and the Practice of Concurrency Control and Recovery, Morgan Kaufmann, 2002.
- Gustavo Alonso, Fabio Casati, Harumi Kuno and Vijay Machiraju. Web Services, Concepts, Architectures and Applications, Springer 2004.
- Munindar P. Singh and Michael N. Huhns. Service-Oriented Computing, Semantics, Processes, Agents, Wiley, 2005.
- Raghu Ramakrishnan and Johannes Gehrke. Database Management Systems, Third Edition, Mc-Graw Hill, 2003.

Comp-6917 Complex networks

Description: Complex problems emerging from various disciplines and interaction of large amount of data can be modelled with networks. Networks are powerful tools for making sense of the world in the big-data era. The scientific study of networks, including computer networks, social networks, and biological networks, has received an enormous amount of interest recently. The rise of the Internet, the wide availability of inexpensive computers, and penetration of smart mobile devices have made it possible to gather and analyze network data on a large scale, and the development of a variety of new theoretical tools has allowed us to extract new knowledge from many different kinds of networks. The study of large, complex networks is broadly interdisciplinary and important developments have occurred in many fields, including mathematics, physics, computer and information sciences, biology, and the social sciences. Subjects covered in this course include the measurement and structure of networks, the fundamentals of network theory, computer algorithms, and spectral methods and mathematical models of networks, all at a much greater scale.

Prerequisite: Graph theory and algorithms at the undergraduate level.

Textbooks:

• Networks. By Mark Newman, Oxford University Press 2018.

Math-6100 Dynamical systems

Description: This course is an introduction to the theory of dynamical systems. The contents include the basic theorems on the existence and uniqueness, continuous dependence of solutions, and the variational equation; equilibria in nonlinear systems, stability, and bifurcations; global nonlinear techniques; closed orbits and limit sets, the Poincare map, the Poincare-Bendixson theorem and its applications.

Prerequisites: Ordinary differential equations and linear algebra at the undergraduate level.

Textbook:

• M. W. Hirsch, S. Smale and R. L., Devaney, Differential Equations, Dynamical Systems, and An Introduction to Chaos, Elsevier, Academic Press, 2004.

Math-6201 Numerical methods for time dependent differential equations

Description: Numerical methods for time-dependent ordinary and partial differential equations, including implicit methods for hyperbolic and parabolic equations. Stability, accuracy, and convergence theory.

Prerequisites: Prior experience with MATLAB (preferred) or compiled programming languages. Solution of elementary PDEs such as wave and diffusion equation (Math-4160 or 4170), and Comp-6910 or equivalent. Math-4162 or Math-6210 recommended.

Recommended texts:

- Uri Ascher, Numerical Methods for Evolutionary Differential Equations, SIAM, 2008, ISBN 978-0898716-52-8.
- Randall LeVeque, Finite Difference Methods for Ordinary and Partial Differential Equations, SIAM, 2007, ISBN 978-0-898716-29-0.
- O Dale R. Durran, Numerical Methods for Fluid Dynamics, Springer, 2010, ISBN 978-1-4419-6412-0.

Math-6202 Nonlinear and linear optimization

Description: Many problems in mathematics, computational science, statistics and engineering, may be posed as an optimization problem. These problems are categorized based on the linearity or nonlinearity of the objective function and constraints and the nature of the decision variables. The numerical algorithms designed to solve these problems may be deterministic or stochastic, gradient-based or derivative–free. This course is intended for graduate students in mathematics, computer science, and other applied science and engineering disciplines where numerical optimization problems arise.

Objectives: This course will provide students with an overview of numerical approaches for linear and nonlinear optimization problems with a focus on theory, implementation and computation.

Prerequisites: Undergraduate linear algebra at the level of Math-2051, multivariable Calculus, experience with programming (Matlab, Python or R preferred), experience with computer simulation.

Credit restrictions: Math-6202 is credit restricted with Comp-6933.

Texts:

- **1** Beck, Introduction to Nonlinear Optimization, SIAM, 2014.
- **2** Griva, Nash & Sofer, Linear and Nonlinear Optimization, SIAM, 2009.
- Ferris, Mangasarian, Wright, Linear Programming with MATLAB, SIAM, 2007.

Math-6204 Iterative methods in numerical linear algebra

Description: In many areas of computational science and engineering, a key bottleneck is the solution of the large linear systems of equations that arise from discretisation, linearisation, and other parts of the

simulation process. In many practical cases, these systems of equations are far too large to allow for solution by classical, "direct" methods such as Gaussian Elimination. As such, iterative methods have become a powerful tool for approximately solving such systems of equations. This course will provide an overview of iterative methods in numerical linear algebra, including Krylov methods and multiscale methods, such as domain decomposition and multigrid.

Objectives: This course is intended for graduate students in Mathematics, Computer Science, and other applied science and engineering disciplines where large linear systems arise in numerical simulations. We will discuss the applicability of and fundamental limitations on direct methods, and explore several families of tools that lead to optimal iterative methods. The goal of this course is to provide students with the "building blocks" of iterative methods, in order for them to use such methods in practical situations.

Prerequisites: Undergraduate linear algebra at the level of Math-2051, experience with programming (Matlab or Python preferred), experience with computer simulation. Completion of Math 6210 and/or 6201 is certainly sufficient, but not strictly necessary.

References:

- **1** Iterative methods for sparse linear systems by Saad.
- **2** Iterative methods for solving linear systems by Greenbaum.
- Matrix iterative analysis by Varga.
- Finite elements and fast iterative solvers with applications in incompressible fluid dynamics by Elman, Silvester, and Wathen.
- **6** Iterative methods for linear systems: theory and applications by Olashanskii and Tyrtyshnikov.
- A multigrid tutorial by Briggs, Henson, and McCormick.
- An introduction to domain decomposition methods: algorithms, theory, and parallel implementation by Dolean, Jolivet, and Nataf.

Math-6210 Numerical solutions of differential equations

Description: Numerical methods for elliptic boundary value problems. Finite difference, finite volume, and finite element methods. Spectral methods and fast Poisson solvers. Introduction to iterative methods for the solution of linear systems.

Prerequisites: Permission of the instructor. Comfort and familiarity with undergraduate numerical analysis, ordinary differential equations, and fluency in MATLAB (or a similar programming language) is expected.

References:

- R. J. LeVeque, Finite Difference Methods for Ordinary and Partial Differential Equations, SIAM, 2007.
- A. Iserles, A First Course in the Numerical Analysis of Differential Equations, Cambridge University Press 1996.

- **3** D. Braess, Finite Elements, Cambridge University Press, 2010.
- Y. Saad, Iterative Methods for Sparse Linear Systems, SIAM 2003.

Math-6351 Advanced linear algebra

Description: Linear algebra is ubiquitous in mathematics and has numerous applications in natural sciences. It provides a foundation for much of modern algebra and has strong connections with functional analysis, quantum mechanics, numerical methods, and differential geometry (to name a few). Even the so-called nonlinear problems can often be solved using methods of linear algebra. This course is intended for graduate students in mathematics, both pure and applied.

Objectives: This course covers the basics of linear algebra including canonical forms of linear operators, inner product spaces and tensors.

Prequisites: Undergraduate linear algebra at the level of MATH 2051.

Texts:

- **1** K. Hoffman and R. Kunze. Linear Algebra. Second Edition. Prentice-Hall, NJ, 1971.
- A. I. Kostrikin and Y. I. Manin. Linear Algebra and Geometry. Gordon and Breach, NY, 1989.

Stat-6503 Stochastic processes

Description: This course provides an introduction to the theory of stochastic processes with emphasis on applications.

Prerequisites: Undergraduate probability and real analysis or authorisation by the instructor.

References:

- **1** Stochastic Processes by Sheldon M. Ross
- Probability and random processes, 3rd ed., by Grimmett and Stirzaker. Oxford
- A first look at rigorous probability theory by Rosenthal.
- **④** Stochastic calculus for finance II: continuous time models by Sherve.
- A first course in stochastic processes by Karlin and Taylor.
- **6** Stochastic Processes by Lawler.
- Stochastic modeling of scientific data by Peter Gutrop.

Stat-6505 Survival analysis

Description: Survival analysis course introduces concepts, statistical models and methods for analysing time-to-event data. It provides an introduction to concepts for analysing time-to-event data such as censoring and truncation, functions used in modelling time-to-event data, some distributions to model time-

to-event, likelihood construction, parametric models for one sample problems and inference procedures for parametric models, non-parametric methods for one sample problems, parametric regression models including proportional hazards regression model and accelerated failure time models, semi-parametric regression models, multi-state models and competing risks. This course is designed both to provide a theoretical and methodological foundation for the analysis of time-to-event data and to show and discuss applications of the statistical models and methods.

Prerequisites: An undergraduate level background in statistical inference and experience using the statistical software package R is expected.

Basic references:

- Lawless, J. F. (2003). Statistical models and methods for lifetime data, 2nd edition. Wiley, New Jersey.
- Kalbfleisch, J. D. and Prentice, R. L. (2002). The statistical analysis of failure time data, 2nd edition.
 Wiley, New Jersey.

Stat-6530 Longitudinal data analysis

Description: This course contains an exposition of the main modern approaches to the analysis of longitudinal data, i.e., data collected repeatedly on experimental units over time (or equivalent conditions). Topics include linear mixed effects models, generalised linear models for correlated data (including generalised estimating equations), computational issues and methods for fitting models.

Prerequisites: None.

References:

- AcArdle and Nessroade. Longitudinal data analysis using structural equation models, 2014.
- Diggle, Heagerty, Linag, and Zeger. Analysis of longitudinal data, 2nd ed, 2002.
- Fitzmairice, Laird, and Ware. Applied longitudinal analysis, 2nd ed, 2011.
- Hedeker and Gibons. Longitudinal analysis, 2006.
- **6** Sutradhar. Dynamic mixed models for familial longitudinal data, 2011.

Stat-6545 Computational statistics

Description: The increase in computing power has stimulated the development of algorithms to solve previously unsolved mathematical functions. There are many statistical techniques which are computationally intensive. Different types of algorithms have been recently developed to deal with simulating random numbers, solving nonlinear systems of equations, and optimisation. The goal of this course is to provide an overview of these methods and their algorithm implementation. Some properties of the methods will also be discussed.
Prerequisites: None.

Text:

• Computational statistics by G.H. Givens and J.A. Hoeting. Wiley, 2005.

Stat-6561 Categorical data analysis

Description: This course will present the statistical methods for analysing categorical data, including conditional and unconditional logistic and Poisson regression, stratified tables, matched pairs analysis, polytomous response, and ordinal data, analysis of multi-dimensional contingency tables and log-linear models. Applications in biological, biomedical, epidemiology and social sciences. Students will use R for statistical analyses.

Prerequisites: None.

References:

- An Introduction to categorical data analysis, 2nd ed., by Alan Agresti. Wiley, 2007.
- Statistical methods for rates and proportions, 3rd ed., by Joseph L. Fleiss, Bruce Levin, and Myunghee Cho Paik. Wiley, 2003.
- O Applied logistic regression by David W. Hosmer and Stanley Lemeshow. Wiley, 2000.

Stat-6563 Sampling theory

Description: This course is designed for graduate students across the university who wish to acquire a deep understanding of the theory and methods in probability sampling. Sampling is one of the classical areas of statistics with potential application in almost every aspect of research in empirical sciences. Although many of the theoretical results have been known for a while, it is the last decade or so when computing developments have made it possible to put these results into practical applications and, as a consequence, a great deal of new problems based on the increasingly demanding challenges posed by empirical research have emerged. The aim of the course is to provide the student with a review of sampling theory under the Horvitz-Thompson paradigm followed by a treatment of adaptive sampling so that at the completion of the course the students are prepared to address sampling issues in a wide spectrum of situations.

Prerequisites: None.

References:

- A. Chaudhuri and H. Stenger. 2005. Survey sampling: theory and methods, 2nd ed. Chapman and Hall.
- **2** W.G. Cochran. 1977. Sampling techniques, 3rd ed. Wiley.
- O Z. Govindarajulu. 1999. Elements of sampling theory and methods. Prentice Hall.
- S. L. Lohr. 2009. Sampling: design and analysis. Brooks/Cole.

- M.E. Thompson. 1997. Theory of sample surveys. Chapman and Hall.
- **6** S. K. Thompson. 2002. Sampling, 2nd ed. Wiley.
- 𝚱 S. K. Thompson and G. A. F. Seber. 2002. Adaptive sampling. Wiley.

Stat-6564 Experimental designs

Description: Experimental designs is one of the most fundamental tools in the statistical analysis toolbox that allows practitioners to obtain the best combination of factor levels used to compare and analyse the treatment responses while optimising the resources. This course is concern with the designs and statistical techniques necessary to make valid inferences in the context of experimental studies.

Prerequisites: Undergraduate course in regression and/or experimental designs.

Tentative course outline:

- 1. Basic principles of experimental designs
- 2. Review of one factor experiments
- 3. Full factorial experiments at two levels
- 4. Split-plot designs
- 5. Factorial experiments with more than two levels
- 6. Response surface methodology
- 7. Optimal designs
- 8. Robust parametric designs
- 9. Robust parameter designs for signal-response systems
- 10. Experiments with non-normal data.

References:

- DC Montgomery, Design and analysis of experiments, 8th ed., Wiley, 2012.
- CFJ Wu, and MS Hamada, Experiments planning, analysis, and parameter design optimization, 2nd ed., Wiley, 2009.
- MS Phadke, Quality engineering using robust design. Prentice-Hall, 1989.
- GEP Box, JS Hunter, and WG Hunter, Statistics for experimenters design, innovation and discovery, 2nd ed., Wiley, 2005.

Stat-6571 Financial and environmental time series

Description: Time Series Analysis has wide applicability in economic and financial fields but also to geophysics, oceanography, atmospheric science, astronomy, engineering, among many other fields of practice. This course consists of a hands-on introduction to time series analysis using current methodology through R with applications to finance and environmental science. This course will cover the standard time series analysis topics such as modelling time series using regression analysis, univariate ARMA/ARIMA mod-

elling, (G)ARCH modelling, Vector Autoregressive (VAR) model along with forecasting, model identification and diagnostics.

Prerequisites: An undergraduate background in regression analysis, linear algebra and statistical inference is expected.

References:

- Time series analysis and its applications by RH Shumway and DS Stoffer, Springer, 2011.
- Handbook of financial time series by TG Andersen, RA Davis, J-P Kresiß, T Mikosch (eds), Springer, 2009.
- Statistics for spatio-temporal data by N Cressie and CK Wikle, Wiley, 2011.
- Applied spatial statistics in R by YV Zhukov, http://www.people.fas.harvard.edu/~zhukov/spatial.html
- Analysis of financial time series (3rd ed) by R Tsay, Wiley, 2010.
- **6** Hidden Markov models for time series by W Zucchini and I MacDonald, CRC Press, 2009.

Stat-6573 Statistical genetics

Description: This is a basic applied course of statistics addressing study designs, ascertainment bias, confounding and other statistical issues in genetics. It covers a range of topics that include population genetics principles, segregation analysis, pedigree analysis, association and linkage disequilibrium, candidate gene and candidate region studies, GAWs, and rare-variant analysis.

Prerequisites: Undergraduate statistics inference and regression, previous exposure to genetics desirable.

References:

- K Lange, 2003. Mathematical and statistical methods for genetic analysis. Springer.
- 2 EA Thompson, 2000. Statistical inference from genetic data on pedigrees. IMS.
- OC Thomas, 2004. Statistical methods in genetic epidemiology. Oxford.
- M Lynch and B Walsh. 1998. Genetic analysis of quantitative traits. Sinauer.
- **5** JD Terwilliger and J Ott, 1994. Handbook of human genetic linkage. Johns Hopkins.
- **6** BS Weir, 1996. Genetic data analysis II. Sinauer.

Med-6260 Applied data analysis for clinical epidemiology

Description: This course is designed to be able to develop an analysis plan to answer a clinical research question, to carry out the analyses, and to report and interpret the results. In particular, students will be able to: i)understand some important study design settings, ii) understand how to formulate research questions, do the preliminary data analysis, iii) understand the purpose of regression analysis, and differentiate between various forms of regression including linear, logistic, Poisson, and Cox proportional hazards regression, iv) understand the requirements for each regression method, v) obtain and interpret the results

from each type of regression model, and vi) understand how to do sample size calculation.

References:

- NP Jewell, Statistics for Epidemiology, Chapman & Hall, 2004.
- S Selvin, Statistical Analysis of Epidemiologic Data, Oxford University Press, 3 rd Edition, 2004.
- DG Kleinbaum and M Klein, Survival Analysis A Self-Learning Text, New York: Springer–Verlag, 1996.

Med-6278 Advanced biostatistics for health research

Description:Students will be introduced to advanced statistical methods required for the analysis of studies in public health and biomedical research.

Prerequisite: Completion of biostatistics (MED-6262) or equivalent.

Appendix E. Faculty involved in the programme

Dr Jahrul Alam résumé

Dr Jahrul M Alam is an associate professor in the Department of Mathematics and Statistics. Dr Alam received BSc (Hons.) and MSc in Mathematics in 1989 and 1990, respectively, from University of Chittagong, Bangladesh. He received MSc in Applied Mathematics, focusing on Computational Fluid Dynamics from University of Alberta in 2000. He received his PhD in Applied Mathematics, specializing in turbulence modelling, from McMaster University in 2006. He pursued postdoctoral training in Earth and Environmental Science at University of Waterloo in the period from January 2007 to July 2008. Dr Alam served as a lecturer/assistant professor for five years in the Department of Mathematics at Shahjalal University of Science and Technology, Bangladesh, where he led a research team in meteorology for the real-time prediction of tide and storm-surge in Bay of Bengal. He joined Memorial University in August 2008 and was promoted to the rank of associate professor of Mathematics in September 2014.

Dr Alam's current research spans various aspects of Atmospheric Turbulence, Large Eddy Simulation, and Mesoscale Meteorology. In particular, his work focuses on wavelet compression of big data and detection of coherent structures in atmospheric turbulence. His research team is developing advanced data structures and parallel algorithms for Navier-Stokes equations and data visualization using object-oriented C++, Python, and Matlab. Dr. Alam's research is primarily funded by NSERC. He published more than 30 articles in prestigious journals and proceedings.

Dr Alex Bihlo résumé

Dr Bihlo is an Associate Professor and Tier II Canada Research Chair in Numerical Analysis and Scientific Computing at the Department of Mathematics and Statistics at Memorial University. He has obtained his PhD in 2011 from the University of Vienna *sub auspiciis praesidentis* (highest distinction in Austria, awarded to 3 out of 642 PhD graduates at the University of Vienna in 2011). He pursued postdoctoral studies at the University of Vienna, the University of Montreal, McGill University, Memorial University and the University of British Columbia before taking on a faculty position at Memorial University in 2015.

Dr Bihlo has co-authored more than 40 papers in the fields of group analysis of differential and difference equations, geometric numerical integration, deep learning, geophysics and geophysical fluid dynamics. For his contributions to the aforementioned areas, Dr Bihlo was named the 2018 recipient of the PIMS–CAIMS Early Career Award.

Dr Bihlo has completed the (co)-supervision of 5 BSc students, 6 MSc students, and one postdoctoral researcher. He currently supervises 1 MSc student, 2 PhD students and 2 postdoctoral researchers.

Dr Sharene D. Bungay résumé

Dr Bungay is an Associate Professor in the Department of Computer Science and current Deputy Head (Undergraduate Studies). Her research interests lie in two main areas: i) computational modelling of physiological systems; and ii) computational chemistry. She has been actively involved in modelling two different physiological systems: the generation of thrombin in coagulation; and the dynamics of calcium in cardiac Purkinje cells. Dr Bungay works on several different aspects of computational chemistry related to the representation, generation, and analysis of chemical structure data. Her research is forming the basis of intelligent search algorithms to retrieve information from the Retrievium database that has been built as a part of this effort.

Dr Yuanzhu Chen résumé

Dr Yuanzhu Chen has been a Professor of Computer Science since 2005, and currently serves as Head of Department. He received the BSc degree from Peking University, China in 1999 and the PhD degree from Simon Fraser University, Canada in 2004. From 2004 to 2005, he was a Post-Doctoral Researcher at Simon Fraser University, and then joined Memorial University in 2005 as tenure-track Assistant Professor. While at Memorial, he was the Deputy Head for Undergraduate Studies from 2012 to 2015 and the Deputy Head for Graduate Studies from 2016 to 2019. Dr Chen's research interests include complex networks, computer networking, online social networks, mobile computing, graph theory, Web information retrieval, and evolutionary computation.

Dr Chen has published over 70 research articles in peer-reviewed journals and conferences in these areas. He has supervised and co-supervised 2 postdoc fellows and over 50 graduate students with funding from national agencies and various university programs and awards. Dr Chen is a recipient of the President's Award for Distinguished Teaching (2018), named as one of the top teachers of Memorial University.

Dr Candemir Cigsar résumé

Dr Candemir Cigsar is an Associate Professor of Statistics in the Department of Mathematics and Statistics at Memorial University of Newfoundland, Canada. He holds a BSc and an MSc in Statistics from Middle East Technical University, Turkey. He received his PhD in Statistics from the University of Waterloo, Canada, in 2010. After a short postdoctoral period in the Department of Mechanical and Industrial Engineering at the University of Toronto, Canada, and another postdoctoral period jointly based in Women's College Research Institute and Princess Margaret Cancer Centre in Toronto, Canada, and working as a senior biostatistician in the Princess Margaret Cancer Centre, Canada, he joined the faculty of Memorial University in 2013. Dr Cigsar's general interests in research focus on developing theory and novel methods in statistics for the analysis of complex data sets arising from system engineering, epidemiology and biomedical sciences. His specialities are analysis of survival and event history data, analysis of recurrent event processes, multistate modelling, sample design, incomplete data analysis, statistical genetics and goodness-of-fit testing. Dr Cigsar enjoys teaching applied and theoretical statistics courses at all levels.

Dr Zhaozhi Fan résumé

Dr Zhaozhi Fan is a professor of Statistics. He received a B. Sc. in Pure Mathematics in 1985, a Master of Science in Statistics in 1988, from Shandong University, China. He has since then been teaching as an assistant professor and associate professor at Shandong University till 1998. He received his PhD of Statistics in 2001 from the Georg-August University of Goettingen, Germany. He spent one year at Case Western Reserve University and three other years thereafter at the University of New Hampshire as a visiting professor. He joined the Department of Mathematics and Statistics, Memorial University in 2005. He has (co-)supervised four PhD students, ten Masters students, two USRA students and four Honours undergraduate students since joining Memorial University. His research has been continually funded by NSERC.

Dr Fan's research lies in the area of both mathematical and applied statistics. His interests include statistical inference of heavy tailed distributions, measurement error models in survival analysis, longitudinal categorical data analysis, high frequency and high dimensional data analysis, free probability theory. Currently, he is working on quantile regression with measurement errors and financial time series.

Dr Armin Hatefi résumé

Dr Armin Hatefi is an assistant professor of Statistics in the Department of Mathematics and Statistics, Memorial University since 2018. He completed his doctoral studies in Statistics in 2014. He was awarded the Fields-Ontario Post-Doctoral fellowship jointly at The Fields Institute for Research in Mathematical Sciences and Department of Statistical Science, University of Toronto from 2015–2017. He then was awarded PIMS-Calgary Post-Doctoral fellowship at University of Calgary for 2017–2018.

Dr Hatefi started his collaborations since his PhD program where he worked with Department of Computer Science at University of Sherbrooke on information-based clustering for analysis of images such as terahertz images and synthetic aperture radar images. At the Fields Institute, his fellowship was based on the thematic program on Statistical Inference, Modelling and Learning of Big Data. Based on his research expertise, he worked on statistical inference of high-dimensional data as well as developing advanced machine learning techniques for rank-based data. In almost all real-life data analysis, for example artificial intelligence, the input data consists of mixed structures of data such as movies, texts, images and so on. Dr Hatefi, during his fellowship at University of Calgary, worked on developing robust classification and clustering methodologies for mixed data.

Dr Hatefi is an active reviewer for various scientific journals in biostatistics and computational statistics including, for instance, Canadian journal of statistics, statistical methods in medical research, biometrical journal, intentional journal of biostatistics, journal of applied statistics, journal of computational statistics, journal of computation and simulation to name a few. His Research interest involves classification, clustering, mixture models, nonparametric and semi-parametric models, machine learning, computational statistics, big data, Bayesian statistics and analysis of complex data including mixed data, network data and ranking data. These methods are being increasingly exploited in various fields including biological data, marine sciences, actuarial sciences, business and medical sciences such as breast cancer prognosis, bone disorder estimation and neuroimaging to name a few.

Dr Ronald Haynes résumé

Dr Ronald D. Haynes is a professor in the Department of Mathematics and Statistics and current chair of the MSc and PhD programs in Scientific Computing. Dr Haynes received a BSc (Hons) in Applied Mathematics from Memorial University in 1996. He then continued his studies at Simon Fraser University completing a MSc in 1998 and PhD in 2003. After completing an NSERC postdoc at the University of Waterloo, jointly in the School of Computer Science and Department of Applied Mathematics, he began his first academic position at Acadia University as an assistant professor. He held this position for five years before coming home to Memorial as an associate professor in the fall of 2009.

Dr Haynes' research involves various aspects of numerical analysis and scientific computing. His interests include numerical methods for partial differential equations (moving mesh methods, domain decomposition, and parallel methods in time), as well as numerical linear algebra and optimization. He has published nearly 50 papers in peer-reviewed journals and has supervised 21 graduate students, 6 post-docs and 17 undergraduate students. His research has been continually funded by NSERC with other grants from CFI and ACOA totalling over \$1.5 million.

Dr Haynes recently received the President's Award for Outstanding Research (2018) and the Dean of Science's Distinguished Teaching Award (2019).

Dr J Concepción Loredo-Osti résumé

Dr J C. Loredo-Osti is a professor in the Department of Mathematics and Statistics where, currently, serves as head of the department. He earned his bachelors and masters degrees in his native Mexico and, in 1996, immigrated to Canada to pursue doctoral studies at Dalhousie University. In 1999, he moved to McGill University, first as a post-doctoral scholar, and then as a research scientist. He joined Memorial University in September of 2005. Since 2014, Dr Loredo-Osti enjoys SNI-Conacyt National Researcher Level II status (Sistema Nacional de Investigadores, Consejo Nacional de Ciencia y Tecnología, México). Amongst the awards that he has received, it should be noted that he was the first recipient of the '*Espíritu Universitario*' medal, the highest distinction confer to alumni by the Universidad Autónoma de San Luis Potosí (this medal was instituted in 2018 as part of the celebrations for the 100 years of university autonomy).

Dr Loredo-Osti has published 46 research papers in specialised journals. His research interests cover topics of time series, longitudinal data analysis, statistical genetics, genomics and proteomics, applied stochastic processes, particularly, α -stable processes applied to the modelling extreme and catastrophic events, and

statistical inference pertinent to data science such as dimension reduction, regression trees, and neural networks. In the last decade, Dr Loredo-Osti has (co)-supervised to completion one post-doctoral scholar, five doctorates, and 16 masters students of statistics.

Because of the interdisciplinary nature of Dr Loredo-Osti research, he has been part of an extensive network of collaboration that includes statisticians, mathematicians, geneticists, biologists, medical doctors, engineers and other people with broad and diverse interests in science from various institutions in Canada, the United States, Latin America and Europe.

Dr Scott MacLachlan résumé

Dr MacLachlan received a BSc (Hon.) in Mathematics and Computer Science from the University of British Columbia in 2000. He received his PhD in Applied Mathematics from the University of Colorado at Boulder in 2004. After postdoctoral periods at the University of Colorado, the University of Minnesota, and the Delft University of Technology, he joined the faculty of Tufts University in January 2008, and was promoted to the rank of Associate Professor of Mathematics at Tufts in September 2012. He joined Memorial University in July 2014 and was promoted to Professor in 2016.

Dr MacLachlan's research interests lie in computational applied mathematics and scientific computation. In particular, his work centres on the development and analysis of finite-element and multigrid methods, typically for PDE-based models of fluid and solid mechanics. His work involves aspects of functional and numerical analysis, numerical linear algebra, and physical modelling. He currently serves as an associate editor of the SIAM Journals on Scientific Computing and on Matrix Analysis and Applications and on the editorial board of Numerical Linear Algebra with Applications. He is on the program committee of the biennial Copper Mountain Conference on Multigrid Methods, where he currently chairs the annual student paper competition. Since 2006, he has had research funding from the European Union, the National Science Foundation (USA), and NSERC. Dr MacLachlan received the President's Award for Outstanding Research in 2019.

Dr George Miminis résumé

Dr Mininis is a Professor in the Department of Computer Science. His research interests are in the areas of scientific computing, numerical methods in control engineering, numerical methods for vector, and parallel architectures. Dr Mininis research projects include i) pole placement problems, ii) numerically efficient techniques on the control and dynamics of large space structures (LSS), and iii) numerical simulation in cancer research: simulation and control.

Dr Lourdes Peña-Castillo résumé

Dr Peña-Castillo is an Associate Professor at the Departments of Biology and Computer Science (jointly appointed) with a cross-appointment to the Discipline of Genetics (Faculty of Medicine). She completed her PhD at the Otto-von-Guericke University Magdeburg in Germany. Her doctoral dissertation focused on multirelational learning. She continued with a postdoc in bioinformatics in the Banting and Best Department of Medical Research at the University of Toronto. Throughout her academic career, she has developed and/or applied artificial intelligence or machine learning methods in various areas such as biomedical sciences, games, and augmented virtuality. Her current main area of research is the application of machine learning-based methods to solve biological problems.

To date, Dr.Peña-Castillo has co-authored 25 journal articles published in journals such as Cell, Nucleic Acids Research, Bioinformatics, Genome Biology, RNA Biology and BMC Genomics. Her articles have been cited more than 2,400 times and her h-index is 17. Her research has been continually funded by NSERC. She has completed the (co-)supervision of 1 honours student, 4 course-based Master's students, 6 thesis-based Master's students and 2 Ph.D. students. She teaches upper level courses in Bioinformatics and Machine Learning.

Dr Hamid Usefi résumé

Dr Hamid Usefi is an associate professor in the department of Mathematics and Statistics with a cross appointment to the department of Computer Science. Dr Usefi obtained his BSc and MSc in Mathematics from Iran and received his PhD from the University of Western Ontario in 2006. He was a postdoctoral fellow at the University of British Columbia for about four years. During his time at UBC he held an NSERC postdoctoral fellowship. He was awarded a MITACS NCE fellowship at the University of Toronto for a year before joining Memorial in 2011.

Dr Usefi's research spans Algebra, Machine Learning, and Cryptography. He has supervised or co-supervised 5 graduate and 3 undergraduate students. His research involves developing novel machine learning algorithms and explore applications in bioinformatics, genetics, finance, and industry.

Dr Asokan Variyath résumé

Dr Asokan Mulayath Variyath is an Associate Professor of Statistics in the department of Mathematics and Statistics at the Memorial University. He obtained his PhD (Statistics) from University of Waterloo in 2006. After PhD, he worked for two years at Texas A & M University as Research Assistant Professor before joining Memorial. Prior to his PhD, he obtained Post Graduate Diploma in Statistical Quality Control and Operations Research (SQC & OR) from Indian Statistical Institute (ISI).

During 1991-2001, Prof Variyath worked at SQC & OR Division of Indian Statistical Institute as a faculty member. While at ISI, he engaged in teaching, research and consultancy with industries to improve quality and productivity. He conducted many training programs for industrial executives in Statistical Process

Control, Design of Experiments, and Reliability and Six Sigma methodologies. He undertook quality and productivity related projects in different industries. During 2006-2008, he was part of the National Cancer Research Institute's Repeatability and Reproducibility Proteomic Project, as a member from Texas A & M University.

At Memorial, he is engaged with teaching and research. He has published more than 30 papers in leading journals. His main research interests are industrial statistics, design of experiments, machine learning, computational statistics, survival analysis and longitudinal studies. He trained six masters and two PhD students and currently supervising one PhD and four master students. Currently, he is a department's Deputy Head (Graduate Studies) and Director of the Statistical Consultancy Centre of Department of Mathematics and Statistics.

Dr Hong Wang résumé

Dr Wang is an Associate Professor of Statistics who works on Markov processes, multi-parameter stochastic processes, martingale theory, order statistics, extreme value theory and related limiting distributions, Recently, he has become involved with probabilistic model building for the classification problem of highfrequency data which involves machine and deep learning. Some of his applied work has been used in fishery related projects conduced by DFO.

Dr Wang has 7 peer-reviewed publications. He has supervised or co-supervised 9 undergraduate and 9 graduate students of statistics whose work was in either applied or theoretical statistics.

Dr Deping Ye résumé

Dr Deping Ye is an associate professor in the department of mathematics and statistics. He received his B.S. degree in 2000 from Shandong University, China, and his PhD degree in 2009 from Case Western Reserve University, USA. After a one-year postdoctoral fellowship at University of Missouri-Columbia, USA (2009-2010) and a one-year Fields-Ontario postdoctoral fellowship (2010-2011), he joined Memorial University of Newfoundland in 2011 and was promoted to associate professor in 2016.

Dr Ye has published more than 30 papers (some of his papers are in the very best mathematics journals) in various research areas, including convex geometry, quantum information theory, mathematical physics, and statistics. He has supervised 2 postdocs, 3 PhD students, 4 master students, and 3 undergraduate students. He received 2017 JMAA Ames Awards and has two highly cited papers. His research has been continuously supported by NSERC. Dr. Ye also actively organizes international conferences and workshops.

Dr Yildiz Yilmaz-Cigsar résumé

Dr Yilmaz is Associate Professor in the Department of Mathematics and Statistics with a joint appointment in the Disciple of Genetics, Faculty of Medicine. After she obtained her PhD degree in Statistics from the University of Waterloo, she held a post-doctoral researcher position in biostatistics at the LunenfeldTanenbaum Research Institute of Mount Sinai Hospital and University of Toronto. She joined Memorial University as an Assistant Professor in 2013.

Her research interests include development and application of statistical methods in biomedicine, epidemiology and human genetics. She has published papers in peer-reviewed statistics, medicine, biomedicine and genetic epidemiology journals. She gives invited talks at scientific meetings and universities. Her research programs have been supported by several funding agencies/institutions.

Dr Yilmaz teaches undergraduate and graduate courses for Statistics programs and has taught graduate courses for the Clinical Epidemiology program and graduate-level lectures for the Human Genetics program at Memorial University. Dr Yilmaz has supervised students at each level of post-doctoral, PhD, MSc and BSc and in each of the Statistics, Human Genetics and Medicine programs. She supervised or cosupervised a post-doctoral researcher in Statistics and Human Genetics, a PhD student in Informatics, 4 MSc (thesis) students in Statistics, an MSc (non-thesis) student in Biostatistics, an MSc (thesis) student in Human Genetics, an Honours BSc (thesis) student in Statistics and 4 undergraduate summer students in Statistics. She is currently supervising a PhD student in Statistics, 3 MSc students in Statistics, an MSc students in Statistics, an MSc students in Statistics, an MSc student in Statistics.

Appendix E. Consultation.

In response to a suggestion from the Dean of Science, we, some faculty members from Mathematics & Statistics and Computer Science, got together late May to start the formal planning of the present proposal, and an informal process of consultation with different parties took place. A few weeks later, we sought the endorsement of an early draft of this proposal from our respective Graduate Studies committees. Further consultation within our departments followed. In general, the proposal was received with enthusiasm and eventually approved in Faculty meetings with an overwhelming support.

Outside of our departments, we requested input from the members of the Faculty of Science. Also, we have consulted with the Faculties of Engineering, Medicine, and Business.

The Heads of Computer Science and Mathematics & Statistics met with the Dean of the Faculty of Engineering on September 19, 2019. There, we learned that Engineering was also considering to launch their own flavour of data science programme before they knew about ours. The meeting was very positive, and we agree to go back to discuss some possible collaboration once our programme is in a more advanced stage.

With the Faculty of Medicine, we have met three times plus several informal conversations. These meetings were attended by different parties interested or involved in the programme (June 6, September 12, October 23, 2019). They agreed to provide us with a list of two elective courses tailored to students interested in doing their project in a health-related area. Some discussion about HPC support was also mentioned.

In the last meeting with the Medicine faculty, one of the Associate Deans raised the issue of ethics and how

it will be delivered. The concern was that a couple of session in the capstone seminar might not be enough.

We met with the Dean and some Faculty from Business on November 14, 2019. The meeting went excellent. They are very much interested in the programme and mentioned the interest of an insurance company in an undergraduate data science programme as well. We agree that some students may be streamed to do their project in business and they provided us with a list of courses to be offered as electives.

The consultation within the Faculty of Science had a few responses, but all of them very enthusiastic. As follow up to this consultation, the Head of Mathematics & Statistics met with Shawn Leroux from Biology (October 4, 2019) to exchange some ideas that can lead to new avenues of development. Other members of the Faculty that have expressed strong support on several occasions.

St. John's, NL November 28, 2019