



Faculty of Science

Office of the Dean
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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 1, 2021, at 1:00 p.m. by Webex.

AGENDA

1. **Regrets**
2. **Adoption of the Minutes of November 17, 2021**
3. **Business Arising from the Minutes**
4. **Correspondence: None**
5. **Reports of Standing Committees:**
 - A. **Undergraduate Studies Committee:**
 - a. Department of Biology, proposal to amend pre-requisite for Biology courses, Paper 5.A.a. (pages 8 to 15)
 - b. Department of Psychology, proposal to amend program regulations, Psychology 11.11.1 regulations (and subsequent renumbering of existing regulations, and 4.3 Core Requirements and Academic Advising, Paper 5.A.b. (pages 16 to 32)
 - c. Department of Psychology, new course proposal, PSYC 4920, Psychological Testing, Paper 5.A.c. (pages 33 to 44)
 - d. Department of Mathematics and Statistics, new course proposal, MATH 1005, Calculus for Business, Paper 5.A.d. (pages 45 to 53)
 - e. Department of Mathematics and Statistics, new course proposal, MATH 4250, Reinforcement Learning, Paper 5.A.e. (pages 54 to 60)
 - f. Department of Mathematics and Statistics, proposal to amend prerequisites for STAT 2500, Statistics for Business and Arts Students, Paper 5.A.f. (pages 61 to 68)
 - g. Department of Mathematics and Statistics, proposal to amend course description for STAT 3585, Paper 5.A.g. (pages 69 to 73)
 - h. Department of Biochemistry, proposal to amend pre-requisites to BIOC 2200, 2201 and 4210, Paper 5.A.h. (pages 74 to 81)
 - i. Department of Computer Science, proposal to amend Program Regulations 11.4.9 Co-operative Internship in Computer Science, and 12.4.3. Third Year Courses, Paper 5.A.i. (pages 82 to 89)

- j. Department of Computer Science, new program proposal, Major in Computer Science (Data Science) (B.Sc. only), Paper 5.A.j. (pages 90 to 102)
 - k. Department of Computer Science, proposal to amend requirements for admission to Computer Science Minor Program, Paper 5.A.k. (pages 103 to 106)
 - l. Department of Computer Science, new course proposal, Computer Science 3400, Data Preparation Techniques, Paper 5.A.l. (pages 107 to 113)
 - m. Department of Computer Science, proposal to amend Program Regulations, 11.4.4 Major in Computer Science (Smart Systems) (B.Sc. only), Paper 5.A.m. (pages 114 to 117)
 - n. Department of Computer Science, proposal to amend statistics requirement for the Computer Science and Economics Joint Major and Computer Science and Geography Joint Major Programs, Paper 5.A.n. (pages 118 to 126)
 - o. Department of Computer Science, proposal to amend Program Regulations 11.4.5 Major in Computer Science (Visual Computing and Games) (B.Sc. only), Paper 5.A.o. (pages 127 to 131).
 - p. Department of Biology, cross-list BIOL 4910 with OCSC 4923 with an amendment to the course title and course description, Paper 5.A.p. (pages 132 to 134)
 - q. Department of Ocean Sciences, proposed special topics course, OCSC 4945, Practical Approaches in Molecular Marine Sciences, Paper 5.A.q. (pages 135 to 145)
- B. Graduate Studies Committee:**
- a. Department of Earth Sciences, Request for Approval of a Graduate Course, EASC 6120, Kinematic modelling of plate tectonics, Paper 5.B.a. (pages 146 to 152)
- C. Library Committee:** No business
- 6. **Reports of Delegates from Other Councils**
 - 7. **Report of the Dean**
 - 8. **Question Period**
 - 9. **Adjournment**



Travis Fridgen, Ph.D.
Acting Dean of Science



Faculty of Science

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**FACULTY OF SCIENCE
FACULTY COUNCIL OF SCIENCE
Minutes of Meeting of November 17, 2021**

A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, November 17, 2021, at 1:00 p.m. using Webex.

FSC 2886

Present

Biochemistry

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

Biology

T. Chapman, E. Edinger, K. Tahlan, B Staveley, Y. Wiersma

Chemistry

C. Bottaro, L. Cahill, H. Grover, M. Katz, S. Pansare, D. Stirling, H. Therien-Aubin

Computer Science

S. Anthony, E. Brown, S. Bungay, C. Dohey, M. Emshey, M. Hamilton, C. Hyde, O. Meruvia-Pastor, C. Milley, G. Miminis, L. Peña-Castillo, K. Popuri, V. Prado da Fonseca, A. Soares, T. Tricco

Earth Sciences

G. Dunning, A. Fiech, G. Layne, K. Welford

Economics

K. Chu

Mathematics & Statistics

A. Bihlo, I. Booth, C. Evans, D. Harvey, R. Haynes, J.C. Loredó-Osti, T. Sheel, T. Stuckless, S. Sullivan, H. Usefi, A. Variyath

Ocean Sciences

D. Boyce, I. Fleming, P. Gagnon, D. Nichols, C. Parrish

Physics & Physical Oceanography

D. Coombs, S. Curnoe, E. Demirov, E. Hayden, M. Morrow, J. Munroe, I. Saika-Voivod, A. Yethiraj, L. Zedel

Psychology

D. Hallett, C. Thorpe, C. Walsh

Dean of Science Office

J. Blundell, S. Dufour, K. Foss, T. Fridgen, L. Frizzell, G. Jackson, J. Kavanagh, G. Kenny, P. MacCallum, T. Mackenzie, J. Major, R. Newhook, J. Whalen,

Guests:

D. Grant

Student Representatives:

A. Meyer

FSC 2887

Regrets:

A Hatefi, S. MacLachlan, S. Mantyka, D. McIlroy, K. Poduska, R. Sipler

FSC 2888

Adoption of Minutes

Moved: Minutes of the meeting of October 20, 2021, be adopted. (Berry/Sullivan)

Carried. Minutes of the meeting of October 29, 2021, be adopted. (Berry/Bungay)

Carried.

FSC 2889

Business Arising: None

FSC 2890

Correspondence: None

FSC 2891

Reports of Standing Committees:

a.

Undergraduate Studies Committee:

Presented by Shannon Sullivan, Chair, Undergraduate Studies Committee:

a. Department of Ocean Sciences, proposal to amend program regulations for a Major in Ocean Sciences (Environmental Systems) (Sullivan/Parrish)

Carried

b. Department of Psychology, proposal to amend suggested course sequence for Table 3 – B.A. (Honours) in Psychology (Co-operative); Table 4 – B.Sc. (Honours) in Psychology (Co-operative); and Table 6 – B.Sc. (Honours) in Behavioural Neuroscience (Co-operative) (Sullivan/Shell) **Carried**

c. Department of Psychology, proposal to amend requirements for a Major in Behavioural Neuroscience (Sullivan/Thorpe) **Carried**

d. Department of Psychology, proposal to amend Psychology Work Term Descriptions (Sullivan/Mackenzie) **Carried**

e. Department of Psychology, proposal to amend Other Requirements for Psychology 3800, Psychology 3820 and Psychology 4870 (Sullivan/Thorpe) **Carried**

f. Department of Earth Sciences, proposal to amend Earth Sciences 3170 and 3172 (Sullivan/Welford) **Carried.**

- b. **Graduate Studies Committee:**
 - a. Department of Computer Science, proposal for a new joint graduate program with the Department of Electrical and Computer Engineering, Faculty of Engineering and Applied Science, Master of Applied Science in Software Engineering; and proposal for a new joint graduate program with the Department of Electrical and Computer Engineering, Faculty of Engineering, Master of Artificial Intelligence (brought forward from the Special Meeting held on October 29, 2021) (Bungay/Miminis) **Carried with one Opposed (Mulligan)**
- c. **Library Committee:** None.

FSC 2892 **Reports of Delegates from Other Councils:** None

FSC 2893 **Report of the Dean**

Presented by Dr. Travis Fridgen, Acting Dean

1. Return to in-person Faculty Council meetings?
The Acting Dean asked for opinions on whether or not the Faculty Council meetings should return to in-person meetings or if a hybrid model would work best. The consensus was that a hybrid model would work best for those who are not on campus and those for whatever reason cannot make it to the meeting in-person. As of January 19, the first meeting in 2022, the meetings will take place in-person and by Webex.
2. J. Blundell reminded everyone about the Whale of a Time social from 5:00-7:00 on November 25 in the Whale Atrium in the CSF. Students, staff and faculty are encouraged to attend. Please remember to RSVP. It will be nice to get out and chat with our colleagues as we near the end of Research Week.

FSC 2894 **Question Period**

Some departments have been working on a submission to the master planning exercise.

Course Hero is a problem that has existed for a number of years. Faculty members could check the site each semester to ensure their course material has not been added to the site, and if the company is contacted and asked to remove material based on copyright laws, they will take it down. It is recommended that the university take a strong role in dealing with these companies, as it can make teaching much more difficult. The Acting Dean will talk to the Provost about this issue.

FSC 2895 **Adjournment**

The meeting adjourned at 1:58 p.m.



Office of the Registrar

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November 24, 2021

TO: All Members of Faculty Council, Faculty of Science

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

SUBJECT: **Proposals for Calendar Changes**

A virtual meeting held on November 18th, 2021, the Faculty of Science Committee on Undergraduate Studies agreed that the following item should be forwarded to Faculty Council for approval:

1. Department of Biology

- a. Amend pre-requisites for Biology courses

2. Department of Psychology

- a. Amend Program Regulations, Psychology 11.11.1. Regulations (and subsequent renumbering of existing regulations), and 4.3 Core Requirements and Academic Advising
- b. New course: Psychology 4920

3. Department of Mathematics and Statistics

- a. New Course - Mathematics 1005
- b. New Course - Mathematics 4250
- c. Amend pre-requisites for Statistics 2500
- d. Amend course description for Statistics 3585

4. Department of Biochemistry

- a. Amend pre-requisites to Biochemistry 2200, 2201 and 4210

5. Department of Computer Science

- a. Amend Program Regulations, 11.4.9 Co-operative Internship in Computer Science, and 12.4.3 Third Year Courses
- b. New program - Major in Computer Science (Data Science) (B.Sc. only)
- c. Amend requirements for admission to the Computer Science Minor Program
- d. New Course - Computer Science 3400
- e. Amend Program Regulations, 11.4.4 Major in Computer Science (Smart Systems) (B.Sc. only)
- f. Amend statistics requirement for the Computer Science and Economics Joint Major and Computer Science and Geography Joint Major Programs
- g. Amend Program Regulations, 11.4.5 Major in Computer Science (Visual Computing and Games) (B.Sc. only)

At the same meeting, the committee approved the following Special Topics Courses and agreed to forward to Faculty of Science Faculty Council for information:

6. Department of Biology

- a. Cross list Biology 4910 with Ocean Sciences 4923 and amend course title and course description

7. Department of Ocean Sciences

- a. New Special Topics course: Ocean Sciences 4945

Tracey Edmunds

Tracey Edmunds

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s): omnibus changes to pre-requisites in Biology
- 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 2010 – Biology of Plants
 BIOL 2060 – Principles of Cell Biology
 BIOL 2250 – Principles of Genetics
 BIOL 2900 – Principles of Evolution and Systematics
 BIOL 3050 – Introduction to Microbiology
 BIOL 3295 – Population and Evolutionary Ecology
 BIOL 3610 – Boreal Ecology
 BIOL 3712 – Benthic Biology
 BIOL 4005 – Biology of Islands
 BIOL 4010 – Virology
 BIOL 4200 – Immunology
 BIOL 4360 – Community and Ecosystem Ecology
 BIOL 4405 – Landscape Ecology
 BIOL 4601 – Functional Biology of Fish
 BIOL 4651 – Conservation Biology II: Conservation in Practice

RATIONALE

The Biology department is seeking to simplify and streamline its program to help students complete their degrees in a timely manner. To that end, we have taken a look at pre-requisites for all our courses and eliminated those that we feel are not essential. Many of the pre-requisite courses that we propose to remove are required to meet degree and/or program requirements; thus, students will still be required to take these courses to meet requirements for graduation. However, by not requiring so many of them for a particular course, it will offer more flexibility for our students, and minimize “bottlenecks” in their degree progress if they fail to complete a particular pre-requisite.

In some cases below, we have removed redundant pre-requisites. For example, in BIOL 2900, BIOL 1001/1002 were listed as pre-requisites, these are pre-requisites for BIOL 2250, which is also listed as a PR. In the case of BIOL 4405, the lab portion of the course was removed in a previous calendar change, making it unnecessary to list BIOL 1807 (Lab Safety) and BIOL 1808 (WHMIS) as PRs. BIOL 4005 also does not have a lab, making it unnecessary to list BIOL 1807/1808; the other change for BIOL 4005 is correction of a typo. Finally for BIOL 4200 we have changed the PRs to match that of BIOC 4105 and PHARM 3006, with which this course is cross-listed. It should be noted that two courses below (2010, 2250) are also listed at Grenfell; Grenfell is proposing

some PR changes, these will align with the changes here. Thus, the changes here do not align with the Calendar listing for Grenfell, but will be aligned in the near future.

CALENDAR CHANGES to 12.2 Biology

2010 Biology of Plants is a study of the structure, function and reproductive biology of plants, with emphasis on the vascular plants, and on their relationship to environment and human activities.

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001 and 1002; ~~Chemistry 1050 (or 1200 or 1010 or the former 1000)~~

2060 Principles of Cell Biology

is a modern view of the biology of eukaryotic cells, organelles and molecules and their interactions in the functioning of living organisms.

CO: ~~Physics 1021 or 1051; Biochemistry 2201 or the former 2101~~

CR: the former BIOL 3060

LH: 3

PR: ~~Physics 1021 or 1051;~~ Science 1807 and Science 1808; BIOL 2250 OR Biochemistry 2201 ~~or the former 2101~~

~~PR:; BIOL 1001, 1002 and 2250; Chemistry 2400~~

2250 Principles of Genetics

is an introduction to Mendelian and molecular genetics. Phenotype and genotype, behaviour of alleles in genetic crosses, chromosome theory of inheritance, genetic linkage, molecular biology of DNA, RNA and protein, molecular basis of mutation, recombinant DNA, applications of genetic biotechnology.

CO: ~~Chemistry 2400~~

CR: Biochemistry 2100, the former BIOL 3250

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001 and 1002;

Chemistry 1050/~~1051~~ (or 1200) ~~and 1001, or 1010 and the former 1011)~~

~~PR: Chemistry 2400~~

2900 Principles of Evolution and Systematics

is an introduction to the processes and patterns of evolution, and the principles of classification. Natural selection and other microevolutionary processes, variation and adaptation, species and speciation, phylogenetic systematics, reconstruction of phylogeny, macro-evolutionary patterns in the fossil record and their interpretation.

CO: ~~Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550~~

CR: the former BIOL 3900

LH: 3

PR: Science 1807 and Science 1808; BIOL ~~1001, 1002,~~ 2250

~~PR: Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550~~

3050 Introduction to Microbiology

is a course in which the basic principles underlying microbial life are studied. Aspects include structure, function, bioenergetics and growth with an emphasis on prokaryotes. Also studied are viruses, microbial diseases, introductory principles of immunology and the control of microorganisms. The laboratory sessions provide training in culture and determinative techniques using microorganisms.

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001 and 1002; Biochemistry 2201 or the former 2101

3295

Population and Evolutionary Ecology

is an introduction to the theory and principles of evolutionary ecology and population dynamics.

CR: the former BIOL 4290

LH: 3

PR: Science 1807 and Science 1808; BIOL 2600, [BIOL 2900](#), ~~at least one of BIOL 2010, 2122 or 2210~~

3610 Boreal Ecology

is a study of the principal features of terrestrial ecosystems, with emphasis on the boreal region. This course may be offered in a usual 13 week semester or as a two-week field course.

CR: Environmental Science 3131

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

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 ~~2010, 2250, 2600 and 2900~~; ~~Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550~~ [30 credit hours in Biology](#)

3712 Benthic Biology

examines the biology of the aquatic benthos (bottom-dwelling organisms); their origins, adaptations, life histories and ecological roles. This course may be offered in a usual 13 week semester or as a two-week field course.

CR: the former Biology 3630

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

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; Biology ~~2122, and 2600 and 3710~~

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 ~~2690~~ and 2900

4010 Virology

will examine topics about viruses infecting all forms of life including humans and other animals, plants and bacteria. The scope within the course ranges from the molecular biology of virus replication to virus evolution and ecology. Current issues concerning viruses and society are incorporated into the course including the practical applications of viruses, vaccines, and emerging viruses.

LH: Three hours of laboratory/seminar/discussion per week

PR: Science 1807 and Science 1808; BIOL ~~2900 and~~ 3050

4200 Immunology

(same as Biochemistry 4105 and Pharmacy 3006) is an introduction to the cells and organs of the innate and adaptive immune systems. The molecular and cellular basis of allergy, autoimmunity, vaccination and cancer immunology will also be discussed.

CR: Biochemistry 4105, Pharmacy 3006, and the former Pharmacy 4105

PR: ~~Science 1807 and Science 1808~~; BIOL ~~2060~~ [BIOC 2201 or the former 2101](#)

4360 Community and Ecosystem Ecology

is a study of the basic principles, patterns and processes of ecological communities and ecosystems.

OR: a seminar/discussion group each week

PR: Science 1807 and Science 1808; BIOL ~~2250, 2600 and 2900~~ and one of

BIOL 2010, 2122 or 2210; ~~Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550~~

4405 Landscape Ecology

is an introduction to the theory and principles of landscape pattern and processes, including issues related to scale, networks, landform and vegetation patterns, species distributions, and natural and human-caused aspects of landscape change.

CO: ~~Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550~~

PR: ~~Science 1807 and Science 1808;~~ BIOL 2600 and 18 credit hours in Biology; ~~Statistics 2550 or any of the courses listed in the credit restrictions of Statistics 2550, or permission from the course instructor~~

4601 Functional Biology of Fish

(same as Ocean Sciences 4601) is an introduction to anatomical, physiological and cellular aspects of selected processes in the life cycle of fishes.

CR: Ocean Sciences 4601

PR: BIOL 2060, 2210; ~~or 3202, and~~ BIOL 3401 or 3640 [is recommended](#)

4651 Conservation Biology II: Conservation in Practice

examines issues relevant to global conservation science. Topics will be covered through a series of modules, including conservation genetics, costs and consequences of small populations, effects of anthropogenic activity on biodiversity, spatial dynamics, and the interface between science and society.

PR: BIOL ~~2900, 3295 and~~ 4650

SECONDARY CALENDAR CHANGES to 12.9 Ocean Sciences

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 [is recommended](#)

CALENDAR ENTRY AFTER CHANGES to 12.2 Biology

2010 Biology of Plants is a study of the structure, function and reproductive biology of plants, with emphasis on the vascular plants, and on their relationship to environment and human activities.

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001 and 1002

2060 Principles of Cell Biology

is a modern view of the biology of eukaryotic cells, organelles and molecules and their interactions in the functioning of living organisms.

CR: the former BIOL 3060

LH: 3

PR: Science 1807 and Science 1808; BIOL 2250 OR Biochemistry 2201

2250 Principles of Genetics

is an introduction to Mendelian and molecular genetics. Phenotype and genotype, behaviour of alleles in genetic crosses, chromosome theory of inheritance, genetic linkage, molecular biology of DNA, RNA and protein, molecular basis of mutation, recombinant DNA, applications of genetic biotechnology.

CR: Biochemistry 2100, the former BIOL 3250

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001 and 1002; Chemistry 1050 (or 1200)

2900 Principles of Evolution and Systematics

is an introduction to the processes and patterns of evolution, and the principles of classification. Natural selection and other microevolutionary processes, variation and adaptation, species and speciation, phylogenetic systematics, reconstruction of phylogeny, macro-evolutionary patterns in the fossil record and their interpretation.

CR: the former BIOL 3900

LH: 3

PR: Science 1807 and Science 1808; BIOL 2250

3050 Introduction to Microbiology

is a course in which the basic principles underlying microbial life are studied. Aspects include structure, function, bioenergetics and growth with an emphasis on prokaryotes. Also studied are viruses, microbial diseases, introductory principles of immunology and the control of microorganisms. The laboratory sessions provide training in culture and determinative techniques using microorganisms.

LH: 3

PR: Science 1807 and Science 1808; BIOL 1001 and 1002;

3295

Population and Evolutionary Ecology

is an introduction to the theory and principles of evolutionary ecology and population dynamics.

CR: the former BIOL 4290

LH: 3

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

3610 Boreal Ecology

is a study of the principal features of terrestrial ecosystems, with emphasis on the boreal region. This course may be offered in a usual 13 week semester or as a two-week field course.

CR: Environmental Science 3131

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

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: BIOL 2600 and 30 credit hours in Biology

3712 Benthic Biology

examines the biology of the aquatic benthos (bottom-dwelling organisms); their origins, adaptations, life histories and ecological roles. This course may be offered in a usual 13 week semester or as a two-week field course.

CR: the former Biology 3630

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

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; Biology 2122 and 2600

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: BIOL 2600 and 2900

4010 Virology

will examine topics about viruses infecting all forms of life including humans and other animals, plants and bacteria. The scope within the course ranges from the molecular biology of virus replication to virus evolution and ecology. Current issues concerning viruses and society are incorporated into the course including the practical applications of viruses, vaccines, and emerging viruses.

LH: Three hours of laboratory/seminar/discussion per week

PR: Science 1807 and Science 1808; BIOL 3050

4200 Immunology

(same as Biochemistry 4105 and Pharmacy 3006) is an introduction to the cells and organs of the innate and adaptive immune systems. The molecular and cellular basis of allergy, autoimmunity, vaccination and cancer immunology will also be discussed.

CR: Biochemistry 4105, Pharmacy 3006, and the former Pharmacy 4105

PR: BIOC 2201 or the former 2101

4360 Community and Ecosystem Ecology

is a study of the basic principles, patterns and processes of ecological communities and ecosystems.

OR: a seminar/discussion group each week

PR: Science 1807 and Science 1808; BIOL 2600 and 2900 and one of BIOL 2010, 2122 or 2210;

4405 Landscape Ecology

is an introduction to the theory and principles of landscape pattern and processes, including issues related to scale, networks, landform and vegetation patterns, species distributions, and natural and human-caused aspects of landscape change.

PR: BIOL 2600 and 18 credit hours in Biology

4601 Functional Biology of Fish

(same as Ocean Sciences 4601) is an introduction to anatomical, physiological and cellular aspects of selected processes in the life cycle of fishes.

CR: Ocean Sciences 4601

PR: BIOL 2060, 2210; BIOL 3401 or 3640 is recommended

4651 Conservation Biology II: Conservation in Practice

examines issues relevant to global conservation science. Topics will be covered through a series of modules, including conservation genetics, costs and consequences of small populations, effects of anthropogenic activity on biodiversity, spatial dynamics, and the interface between science and society.

PR: BIOL 4650

SECONDARY CALENDAR CHANGES to 12.9 Ocean Sciences

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, 2210; Biology 3401 or 3640 is recommended

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

CONSULTATIONS SOUGHT

From

Grenfell campus
Faculty of Business Administration
Faculty of Education
Faculty of Engineering & Applied Science
Faculty of Humanities & Social Sciences
Faculty of Science
Department of Biochemistry
Department of Chemistry
Department of Computer Sciences
Department of Earth Sciences
Department of Economics
Department of Geography
Department of Mathematics and Statistics

Response Received

Department of Ocean Sciences

YES – amendments made

Department of Physics and Physical Oceanography

Department of Psychology

Marine Institute

School of Human Kinetics and Recreation

School of Medicine

School of Nursing

School of Pharmacy

School of Social Work

LIBRARY REPORT

Not applicable.

RESOURCE IMPLICATIONS

Since these are deletions of pre-requisites, there are no resource implications.

Memorial University of Newfoundland

Undergraduate Calendar Change Proposal Form

Senate Summary Page for Programs

PROGRAM TITLE

Faculty of Science, Degree Regulations 4.3 Core Requirements and Academic Advising;
Faculty of Science, Program Regulations, Psychology, 11.11.1 Regulations

RATIONALE

The addition of a new clause to 4.3 reflects the long-standing process of granting a degree waiver for 4.3.1.b. (requirement for 6 credit hours in Mathematics or Statistics) for Psychology/Behavioural Neuroscience majors who complete 3 credit hours in PSYC 2911 (a statistics course) and 3 credit hours in MATH 1000.

This change requires an addition to the program regulations for Psychology (11.11.1) for student information purposes (and subsequent renumbering of the existing regulations).

CALENDAR CHANGES

4.3 Core Requirements and Academic Advising

1. A student for the General Degree of Bachelor of Science or the Honours Degree of Bachelor of Science shall complete the Core Requirements, which consist of the following:
 - a. 6 credit hours in **Critical Reading and Writing (CRW)** courses, including at least 3 credit hours in English courses,
 - b. 6 credit hours in Mathematics and Statistics courses, and
 - c. 6 credit hours in courses from each of two subject areas listed under **Programs in the Faculty of Science** other than Mathematics and Statistics.
2. The Core Requirements may be modified for students in certain programs by approved departmental regulations.

~~2.3.~~ Students for the General Degree of Bachelor of Science or the Honours Degree of Bachelor of Science, as well as students enrolled in a Minor program in the Faculty of Science, are strongly encouraged to consult regularly with the Head (or delegate) of each Major department and Minor department to discuss course registrations, to ensure compliance with all relevant academic regulations, and to seek advice regarding programs suitable to their particular needs.

CALENDAR CHANGES

11.11.1. Regulations

Students who are completing a Major or Honours program in Psychology or Behavioural Neuroscience may substitute Psychology 2911 for 3 credit hours in Mathematics and Statistics courses for the purpose of fulfilling the Core Requirements, as described under 4.3 Core Requirements and Academic Advising.

~~11.11.1.~~ 11.11.2 Admission to Major Programs

11.11.2 Admission to Major Programs

Admission to the Major programs in the Department of Psychology is competitive and selective. Students who wish to enter these programs must submit a completed application form, available on the Department of Psychology website in the Winter semester, to the Department of Psychology by June 1 for Fall semester registration. To be eligible for admission, students must have completed the 24 credit hours as listed below with an average of at least 65% in Psychology 1000/1001 and an overall average of at least 60% in Psychology, [Critical Reading and Writing \(CRW\)](#), and Mathematics:

1. Psychology 1000, 1001.
2. Six credit hours in [Critical Reading and Writing \(CRW\)](#) courses, including at least 3 credit hours in English courses.
3. Mathematics 1000, or two of 1090, 1050, 1051 (or equivalent).
4. Six credit hours of electives (9 if only Mathematics 1000 is successfully completed).

Students who fulfil 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.

11.11.3 Admission to Honours Programs

The Honours programs in the Department of Psychology are designed for students who would like to concentrate their studies or pursue graduate work. Students who wish to be admitted to these programs must submit an application to the Department of Psychology by June 1 for Fall semester registration. This form is available on the Department of Psychology website in the Winter semester. To be eligible for admission, students must have successfully completed Psychology 2910, 2911, 2520 or 2521, and 2930 and obtained in these courses a grade of "B" or better, or an average of 75% or higher. Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance in the required courses. In special circumstances, students may be admitted to Honours Programs at times other than June.

Note:

Students are advised to consult the [Bachelor of Arts \(Honours\) Degree Regulations](#) or [Degree Regulations](#) for the Honours Degree of Bachelor of Science, as appropriate.

11.11.4 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.

1. Students may Major in Psychology as part of either a B.A. or a B.Sc. program, and should consult the [Degree Regulations](#) for the General Degree of Bachelor of Science or the [Degree Regulations](#) 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.
 - b. 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 successfully complete the following:
 - a. Mathematics 1000 (or equivalent).
 - b. Biology 1001 and 1002.
 - c. Either Chemistry 1050 and 1051 (or 1200 and 1001 or 1010 and the former 1011); 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.

3. Psychology Majors following the B.A. program are also required to successfully complete Mathematics 1000 or two of 1090, 1050, 1051 (or equivalent), and are encouraged to complete at least 6 credit hours in Biology.

11.11.4-11.11.5 Requirements for Honours in Psychology

Students completing this program cannot receive credit for Psychology 2920.

1. Honours students in Psychology should consult [Degree Regulations](#) for the Honours Degree of Bachelor of Science or Bachelor of Arts (Honours) [Degree Regulations](#) as appropriate. All Honours students are required to successfully complete the 60 credit hours of Psychology as listed below:
 - a. Psychology 1000, 1001, 2520 (or 2521), 2910, 2911, 2930, 3900, 4910, 499A/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 successfully 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 499A/B grading evaluation) will result in one of the following grades being awarded:
 - o **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.
 - o **Pass:** Indicates performance meets expectations in the formal written report and in classwork.
 - o **Fail:** Indicates failing performance in the formal written report and/or the classwork.

11.11.5-11.11.6 Requirements for a Major in Behavioural Neuroscience (B.Sc. Only)

Students completing this program cannot receive credit for Psychology 2920.

A program is offered in the Psychology Department to provide an education in Behavioural Neuroscience. Students planning to enroll in the program are advised to consult with the Head of the Department at the earliest opportunity because certain course choices may restrict later options. Students who intend to pursue graduate studies should take courses leading to the Honours degree. As a component of the [Degree Regulations](#) for the General Degree of Bachelor of Science, the program for a Major in Behavioural Neuroscience shall include:

1.
 - a. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, and one of 3810, 3830, 3840, or 3860.
 - b. Three credit hours in Psychology chosen from the following: 3050, 3100, the former 3250, 3251, 3350, 3450, 3620, 3650, 3750.
 - c. Any research experience course and one of Psychology 4250, 4251, 4850, 4851, 4852, 4853, or 4854; or, any selected topics course and Psychology 4870.
2.
 - a. Mathematics 1000 (or equivalent) and 1001.
 - b. Chemistry 1050 and 1051 (or 1200 and 1001).

- c. Physics 1020 (or 1050) and 1021 (or 1051).
 - d. Biology 1001 and 1002.
 - e. Six credit hours in [Critical Reading and Writing \(CRW\)](#) courses, including at least 3 credit hours in English courses.
3. Eighteen credit hours from the following courses chosen from at least two different sciences:
- a. Biochemistry: Any 2000-, 3000-, or 4000-level course except the former 2000, 2005, the former 2010, the former 2011, 3202, 3402, or 4502.
 - b. Biology: Any 2000-, 3000-, or 4000-level course except 2040, 2041, 2120, 3053, or 3820.
 - c. Chemistry: 2100, 2210, 2301 (or the former Chemistry 2300), 2400, 2401, or any 3000 or 4000 level course.
 - d. Computer Science: Any 2000, 3000, or 4000 level course except the former 2650 and the former 2801.
 - e. Ocean Sciences: any 2000-, 3000-, or 4000-level course.
 - f. Mathematics: 2000, 2050, 2051, 3000, 3001 or any 3000 or 4000 level pure or applied mathematics course.
 - g. Medicine 310A/B.
 - h. Physics: Any 2000, 3000, or 4000 level course except 2151, 3150, 3151.

Notes:

9. *Credit may not be obtained for both Biology 3750 and Psychology 3750 or for both Biology 4701 and Psychology 4701.*

10. *The courses listed under Clause 3 may have prerequisites. It is the student's responsibility to ensure that all prerequisites have been met, or that waivers have been obtained, before registering for these courses.*

11.11.6-11.11.7 Requirements for Honours in Behavioural Neuroscience (B.Sc. Only)

Students in Behavioural Neuroscience should consult [Degree Regulations](#) 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 successfully complete the following Psychology courses:
 - a. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, 3900.
 - 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.
 - e. Psychology 499A/B, an undergraduate thesis to be submitted in their graduating year.
2. Honours students in Behavioural Neuroscience must also successfully 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 [Degree Regulations](#) for the Honours Degree of Bachelor of Science, Honours students 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.

Note:

Non-Psychology courses taken to fulfill the requirements of this Clause for a major in Behavioural Neuroscience are used to calculate eligibility for Honours standing.

11.11.7-11.11.8 Requirements for a Minor in Psychology

Students who Minor in Psychology are required to complete a minimum of 24 credit hours of Psychology as follows:

- a. Psychology 1000, 1001, and 2920 (or 2910 or 2925)
- b. Fifteen other credit hours of Psychology.

11.11.8 11.11.9 Requirements for Major and Honours in Psychology (Co-operative) (B.A. or B.Sc.), and Major and Honours in Behavioural Neuroscience (Co-operative) (B.Sc. only)

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Psychology Co-op Program (PCOP)

The Psychology Co-op Program (PCOP) is available to full-time Psychology (B.A. and B.Sc.) and Behavioural Neuroscience Majors and Honours students only.

The PCOP provides an opportunity for students to learn valuable practical skills while working in fields related to Psychology. Students complete three Work Terms, which consist of full-time paid employment. The timing of the Work Terms is such that employers stand to gain from the acquired skills of psychology majors in training. The objectives of the Work Term component of the PCOP are embodied in the [Work Term Descriptions](#).

11.11.8.1 11.11.9.1 Admission Requirements

1. Admission is limited, competitive, and selective.
2. The primary criteria used in reaching decisions on applications for admission are motivation and overall academic performance. Students may be required to participate in an interview as part of the selection process.
3. Students must first be admitted to the Psychology (B.A. or B.Sc.) or Behavioural Neuroscience Major.
4. To be eligible for admission, students must have completed a minimum of 30 credit hours with an overall average of at least 65%, and an average of at least 65% in all Psychology courses. Students must have a passing grade in all required courses, and must have full-time status in the semester in which they apply.
5. Applications are accepted in the Fall semester only; students should consult the Department for the specific application deadline.

11.11.8.2 11.11.9.2 Program of Study

1. In addition to the requirements below students must fulfill all requirements for either a Major in Psychology (B.A.), a Major in Psychology (B.Sc.), Major in Behavioural Neuroscience, Honours in Psychology (B.A.), Honours in Psychology (B.Sc.), or Honours in Behavioural Neuroscience. Courses in each program are normally taken in blocks as shown in the appropriate program table. Students should consult with a faculty advisor each semester regarding course selection.
2. Students' status in the program is assessed at the end of each semester. To remain in PCOP, students must receive a passing grade in all required courses, and must maintain an average of at least 65% in all Psychology courses and a cumulative average of at least 65%. A student who fails a required course, fails to maintain an average of 65% in Psychology courses, or fails to maintain a cumulative average of 65%, will be required to withdraw from PCOP. The student in question may apply for readmission in a subsequent year after passing the specified required course(s) previously failed, or re-establishing the required average.
3. Students are required to successfully complete three work terms.

11.11.8.3 11.11.9.3 Work Term Placement

1. General management of the PCOP is the responsibility of the designated Academic Staff Member in Co-operative Education (ASM-CE). ASM-CEs are responsible for facilitating the engagement of potential employers in the program, organizing competitions for Work Term employment, arranging job interviews, managing the co-operative education program database, developing employment opportunities and monitoring students during the work term. The ASM-CEs work with the Department to counsel students, visit students on their work assignments and evaluate the work term.
2. Students are ultimately responsible for securing their work term placements. ASM-CEs provide support for the job search and inform students of potential opportunities.

3. A student in the co-operative education program gives permission to the University to provide a copy of the applicant's resume, university transcript and work term evaluations to potential employers.
4. A student who is enrolled in a co-operative education program may independently obtain a work term placement in consultation with the ASM-CE. Such employment positions must satisfy the criteria for work terms, be confirmed in writing by the employer and be approved by the ASM-CE before the first day of the work term according to the [Co-operative Education website](#).
5. Work terms are normally 12 weeks in duration, full-time and paid. Remuneration for work placements is determined by employers based on their internal wage structures. The start and end dates for the work term are shown on the [Co-operative Education website](#).

11.11.8.4-11.11.9.4 Registration and Evaluation of Performance

1. In Work Terms I, II, and III, students must register for Psychology 199W, 299W, and 399W respectively.
2. Student performance evaluations are to be completed by the employer in conjunction with the student and returned to the ASM-CE. The Work Term evaluations shall consist of at least two components:
 - a. On-the-job Student Performance: assessed by the ASM-CE using information gathered during the Work Term and input from the employer towards the end of the Work Term. Formal written documentation from the employer shall be sought. Evaluation of the job performance will result in one of the following classifications: OUTSTANDING, EXCEEDS EXPECTATIONS, SATISFACTORY, OR FAIL
 - b. Work Term Assignment(s)
- iii. Students are required to submit Work Term assignments as outlined in the course syllabus.
- iv. Work Term assignments are evaluated by the ASM-CE.

Evaluation of the work term assignment(s) will result in one of the following classifications: OUTSTANDING, EXCEEDS EXPECTATIONS, SATISFACTORY, OR FAIL.

The evaluation of the job performance and the work term assignments are recorded separately on the transcript. Overall evaluation of the work term will result in one of the following final grades being awarded:

- Pass with Distinction: Indicates OUTSTANDING PERFORMANCE in both the work term assignment(s) and the job performance.
- Pass: Indicates that PERFORMANCE MEETS EXPECTATIONS in both the work term assignment(s) and the job performance.
- Fail: Indicates FAILING PERFORMANCE in the work term assignment(s) or the job performance, or both.

To remain in PCOP, a student must obtain a final grade of PAS.

3. If a student fails to achieve the Work Term standards specified above, the student will be required to withdraw from PCOP. Such a student may reapply to the program, at which time the student will be required to repeat the Work Term with satisfactory performance. Only one Work Term may be repeated in the entire program.
4. In order to be considered for readmission, students must formally apply for readmission to the program not later than the deadline date specified in [Admission Requirements](#).
5. A student who withdraws from a Work Term without acceptable cause subsequent to a job placement will be required to withdraw permanently from PCOP.
6. Students who drop a Work Term without prior approval from both ASM-CE and the Head of the Department of Psychology, or who fail to honour an agreement to work with an employer, or conduct themselves in such a manner as to cause their discharge from the job, will be awarded an overall grade of FAL for the Work Term in question and will be required to withdraw permanently from PCOP.
7. Permission to drop a Work Term does not constitute a waiver of degree requirements, and students who have obtained such permission must successfully complete an approved Work Term in lieu of the one dropped.

11.11.9-11.11.10 Suggested Course Sequences

The tables below show suggested course sequences for the [B.A. in Psychology \(Co-operative\)](#), the [B.Sc. in Psychology \(Co-operative\)](#), the [B.A. Honours in Psychology \(Co-operative\)](#), the [B.Sc. Honours in Psychology \(Co-operative\)](#), the [B.Sc. in Behavioural Neuroscience \(Co-operative\)](#), and the [B.Sc. Honours in Behavioural Neuroscience \(Co-operative\)](#).

Course patterns may vary. Students are encouraged to meet with the undergraduate coordinator early in their program in order to establish a course pattern that meets the requirements as set out in these regulations.

CALENDAR ENTRY AFTER CHANGES

4.3 Core Requirements and Academic Advising

1. A student for the General Degree of Bachelor of Science or the Honours Degree of Bachelor of Science shall complete the Core Requirements, which consist of the following:
 - a. 6 credit hours in [Critical Reading and Writing \(CRW\)](#) courses, including at least 3 credit hours in English courses,
 - b. 6 credit hours in Mathematics and Statistics courses, and
 - c. 6 credit hours in courses from each of two subject areas listed under [Programs in the Faculty of Science](#) other than Mathematics and Statistics.
2. The Core Requirements may be modified for students in certain programs by approved departmental regulations.
3. Students for the General Degree of Bachelor of Science or the Honours Degree of Bachelor of Science, as well as students enrolled in a Minor program in the Faculty of Science, are strongly encouraged to consult regularly with the Head (or delegate) of each Major department and Minor department to discuss course registrations, to ensure compliance with all relevant academic regulations, and to seek advice regarding programs suitable to their particular needs.

11.11.1. Regulations

Students who are completing a Major or Honours program in Psychology or Behavioural Neuroscience may substitute Psychology 2911 for 3 credit hours in Mathematics and Statistics courses for the purpose of fulfilling the Core Requirements, as described under [4.3 Core Requirements and Academic Advising](#).

11.11.2 Admission to Major Programs

Admission to the Major programs in the Department of Psychology is competitive and selective. Students who wish to enter these programs must submit a completed application form, available on the Department of Psychology website in the Winter semester, to the Department of Psychology by June 1 for Fall semester registration. To be eligible for admission, students must have completed the 24 credit hours as listed below with an average of at least 65% in Psychology 1000/1001 and an overall average of at least 60% in Psychology, [Critical Reading and Writing \(CRW\)](#), and Mathematics:

5. Psychology 1000, 1001.
6. Six credit hours in [Critical Reading and Writing \(CRW\)](#) courses, including at least 3 credit hours in English courses.
7. Mathematics 1000, or two of 1090, 1050, 1051 (or equivalent).
8. Six credit hours of electives (9 if only Mathematics 1000 is successfully completed).

Students who fulfil 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.

11.11.3 Admission to Honours Programs

The Honours programs in the Department of Psychology are designed for students who would like to concentrate their studies or pursue graduate work. Students who wish to be admitted to these programs must submit an application to the Department of Psychology by June 1 for Fall semester registration. This form is available on the Department of Psychology website in the Winter semester. To be eligible for admission, students must have successfully completed Psychology 2910, 2911, 2520 or 2521, and 2930 and obtained in these courses a grade of "B" or better, or an average of 75% or higher. Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance in the required courses. In special circumstances, students may be admitted to Honours Programs at times other than June.

Note:

Students are advised to consult the [Bachelor of Arts \(Honours\) Degree Regulations](#) or [Degree Regulations](#) for the Honours Degree of Bachelor of Science, as appropriate.

11.11.4 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.

4. Students may Major in Psychology as part of either a B.A. or a B.Sc. program, and should consult the [Degree Regulations](#) for the General Degree of Bachelor of Science or the [Degree Regulations](#) 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.
 - b. 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.
5. Psychology Majors following the B.Sc. program are also required to successfully complete the following:
 - a. Mathematics 1000 (or equivalent).
 - b. Biology 1001 and 1002.
 - c. Either Chemistry 1050 and 1051 (or 1200 and 1001 or 1010 and the former 1011); 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.

6. Psychology Majors following the B.A. program are also required to successfully complete Mathematics 1000 or two of 1090, 1050, 1051 (or equivalent), and are encouraged to complete at least 6 credit hours in Biology.

11.11.5 Requirements for Honours in Psychology

Students completing this program cannot receive credit for Psychology 2920.

5. Honours students in Psychology should consult [Degree Regulations](#) for the Honours Degree of Bachelor of Science or Bachelor of Arts (Honours) [Degree Regulations](#) as appropriate. All Honours students are required to successfully complete the 60 credit hours of Psychology as listed below:
 - a. Psychology 1000, 1001, 2520 (or 2521), 2910, 2911, 2930, 3900, 4910, 499A/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.
6. Honours students must also successfully complete the requirements listed in either Clause 2. or Clause 3., as applicable, of the requirements for a Major in Psychology.
 7. Honours students will be required to submit in their graduating year, an undergraduate thesis (Psychology 499A/B) which demonstrates their competence in Experimental Psychology.
 8. The overall evaluation of the Honours dissertation (i.e. the Psychology 499A/B grading evaluation) will result in one of the following grades being awarded:
 - o **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.
 - o **Pass:** Indicates performance meets expectations in the formal written report and in classwork.
 - o **Fail:** Indicates failing performance in the formal written report and/or the classwork.

11.11.6 Requirements for a Major in Behavioural Neuroscience (B.Sc. Only)

Students completing this program cannot receive credit for Psychology 2920.

A program is offered in the Psychology Department to provide an education in Behavioural Neuroscience. Students planning to enroll in the program are advised to consult with the Head of the Department at the earliest opportunity because certain course choices may restrict later options. Students who intend to pursue graduate studies should take courses leading to the Honours degree. As a component of the [Degree Regulations](#) for the General Degree of Bachelor of Science, the program for a Major in Behavioural Neuroscience shall include:

4.
 - a. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, and one of 3810, 3830, 3840, or 3860.
 - b. Three credit hours in Psychology chosen from the following: 3050, 3100, the former 3250, 3251, 3350, 3450, 3620, 3650, 3750.
 - c. Any research experience course and one of Psychology 4250, 4251, 4850, 4851, 4852, 4853, or 4854; or, any selected topics course and Psychology 4870.
5.
 - a. Mathematics 1000 (or equivalent) and 1001.
 - b. Chemistry 1050 and 1051 (or 1200 and 1001).
 - c. Physics 1020 (or 1050) and 1021 (or 1051).
 - d. Biology 1001 and 1002.
 - e. Six credit hours in [Critical Reading and Writing \(CRW\)](#) courses, including at least 3 credit hours in English courses.
6. Eighteen credit hours from the following courses chosen from at least two different sciences:
 - a. Biochemistry: Any 2000-, 3000-, or 4000-level course except the former 2000, 2005, the former 2010, the former 2011, 3202, 3402, or 4502.
 - b. Biology: Any 2000-, 3000-, or 4000-level course except 2040, 2041, 2120, 3053, or 3820.
 - c. Chemistry: 2100, 2210, 2301 (or the former Chemistry 2300), 2400, 2401, or any 3000 or 4000 level course.
 - d. Computer Science: Any 2000, 3000, or 4000 level course except the former 2650 and the former 2801.
 - e. Ocean Sciences: any 2000-, 3000-, or 4000-level course.
 - f. Mathematics: 2000, 2050, 2051, 3000, 3001 or any 3000 or 4000 level pure or applied mathematics course.
 - g. Medicine 310A/B.
 - h. Physics: Any 2000, 3000, or 4000 level course except 2151, 3150, 3151.

Notes:

9. Credit may not be obtained for both Biology 3750 and Psychology 3750 or for both Biology 4701 and Psychology 4701.
10. The courses listed under Clause 3 may have prerequisites. It is the student's responsibility to ensure that all prerequisites have been met, or that waivers have been obtained, before registering for these courses.

11.11.7 Requirements for Honours in Behavioural Neuroscience (B.Sc. Only)

Students in Behavioural Neuroscience should consult [Degree Regulations](#) for the Honours Degree of Bachelor of Science. Students completing this program cannot receive credit for Psychology 2920.

4. Honours students in Behavioural Neuroscience are required to successfully complete the following Psychology courses:
 - a. Psychology 1000, 1001, 2521, 2910, 2911, 2930, 3800, 3820, 3900.
 - 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.
 - e. Psychology 499A/B, an undergraduate thesis to be submitted in their graduating year.
5. Honours students in Behavioural Neuroscience must also successfully complete the requirements listed in Clauses 2. and 3. of the requirements for a Major in Behavioural Neuroscience.
6. In accordance with [Academic Standing](#) under the [Degree Regulations](#) for the Honours Degree of Bachelor of Science, Honours students 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.

Note:

Non-Psychology courses taken to fulfill the requirements of this Clause for a major in Behavioural Neuroscience are used to calculate eligibility for Honours standing.

11.11.8 Requirements for a Minor in Psychology

Students who Minor in Psychology are required to complete a minimum of 24 credit hours of Psychology as follows:

- c. Psychology 1000, 1001, and 2920 (or 2910 or 2925)
- d. Fifteen other credit hours of Psychology.

11.11.9 Requirements for Major and Honours in Psychology (Co-operative) (B.A. or B.Sc.), and Major and Honours in Behavioural Neuroscience (Co-operative) (B.Sc. only)

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Psychology Co-op Program (PCOP)

The Psychology Co-op Program (PCOP) is available to full-time Psychology (B.A. and B.Sc.) and Behavioural Neuroscience Majors and Honours students only.

The PCOP provides an opportunity for students to learn valuable practical skills while working in fields related to Psychology. Students complete three Work Terms, which consist of full-time paid employment. The timing of the Work Terms is such that employers stand to gain from the acquired skills of psychology majors in training. The objectives of the Work Term component of the PCOP are embodied in the [Work Term Descriptions](#).

11.11.9.1 Admission Requirements

6. Admission is limited, competitive, and selective.
7. The primary criteria used in reaching decisions on applications for admission are motivation and overall academic performance. Students may be required to participate in an interview as part of the selection process.

8. Students must first be admitted to the Psychology (B.A. or B.Sc.) or Behavioural Neuroscience Major.
9. To be eligible for admission, students must have completed a minimum of 30 credit hours with an overall average of at least 65%, and an average of at least 65% in all Psychology courses. Students must have a passing grade in all required courses, and must have full-time status in the semester in which they apply.
10. Applications are accepted in the Fall semester only; students should consult the Department for the specific application deadline.

11.11.9.2 Program of Study

4. In addition to the requirements below students must fulfill all requirements for either a Major in Psychology (B.A.), a Major in Psychology (B.Sc.), Major in Behavioural Neuroscience, Honours in Psychology (B.A.), Honours in Psychology (B.Sc.), or Honours in Behavioural Neuroscience. Courses in each program are normally taken in blocks as shown in the appropriate program table. Students should consult with a faculty advisor each semester regarding course selection.
5. Students' status in the program is assessed at the end of each semester. To remain in PCOP, students must receive a passing grade in all required courses, and must maintain an average of at least 65% in all Psychology courses and a cumulative average of at least 65%. A student who fails a required course, fails to maintain an average of 65% in Psychology courses, or fails to maintain a cumulative average of 65%, will be required to withdraw from PCOP. The student in question may apply for readmission in a subsequent year after passing the specified required course(s) previously failed, or re-establishing the required average.
6. Students are required to successfully complete three work terms.

11.11.9.3 Work Term Placement

6. General management of the PCOP is the responsibility of the designated Academic Staff Member in Co-operative Education (ASM-CE). ASM-CEs are responsible for facilitating the engagement of potential employers in the program, organizing competitions for Work Term employment, arranging job interviews, managing the co-operative education program database, developing employment opportunities and monitoring students during the work term. The ASM-CEs work with the Department to counsel students, visit students on their work assignments and evaluate the work term.
7. Students are ultimately responsible for securing their work term placements. ASM-CEs provide support for the job search and inform students of potential opportunities.
8. A student in the co-operative education program gives permission to the University to provide a copy of the applicant's resume, university transcript and work term evaluations to potential employers.
9. A student who is enrolled in a co-operative education program may independently obtain a work term placement in consultation with the ASM-CE. Such employment positions must satisfy the criteria for work terms, be confirmed in writing by the employer and be approved by the ASM-CE before the first day of the work term according to the [Co-operative Education website](#).
10. Work terms are normally 12 weeks in duration, full-time and paid. Remuneration for work placements is determined by employers based on their internal wage structures. The start and end dates for the work term are shown on the [Co-operative Education website](#).

11.11.9.4 Registration and Evaluation of Performance

8. In Work Terms I, II, and III, students must register for Psychology 199W, 299W, and 399W respectively.
9. Student performance evaluations are to be completed by the employer in conjunction with the student and returned to the ASM-CE. The Work Term evaluations shall consist of at least two components:
 - a. On-the-job Student Performance: assessed by the ASM-CE using information gathered during the Work Term and input from the employer towards the end of the Work Term. Formal written documentation from the employer shall be sought. Evaluation of

the job performance will result in one of the following classifications: OUTSTANDING, EXCEEDS EXPECTATIONS, SATISFACTORY, OR FAIL

- b. Work Term Assignment(s)
- iii. Students are required to submit Work Term assignments as outlined in the course syllabus.
- iv. Work Term assignments are evaluated by the ASM-CE.

Evaluation of the work term assignment(s) will result in one of the following classifications: OUTSTANDING, EXCEEDS EXPECTATIONS, SATISFACTORY, OR FAIL.

The evaluation of the job performance and the work term assignments are recorded separately on the transcript. Overall evaluation of the work term will result in one of the following final grades being awarded:

- Pass with Distinction: Indicates OUTSTANDING PERFORMANCE in both the work term assignment(s) and the job performance.
- Pass: Indicates that PERFORMANCE MEETS EXPECTATIONS in both the work term assignment(s) and the job performance.
- Fail: Indicates FAILING PERFORMANCE in the work term assignment(s) or the job performance, or both.

To remain in PCOP, a student must obtain a final grade of PAS.

10. If a student fails to achieve the Work Term standards specified above, the student will be required to withdraw from PCOP. Such a student may reapply to the program, at which time the student will be required to repeat the Work Term with satisfactory performance. Only one Work Term may be repeated in the entire program.
11. In order to be considered for readmission, students must formally apply for readmission to the program not later than the deadline date specified in [Admission Requirements](#).
12. A student who withdraws from a Work Term without acceptable cause subsequent to a job placement will be required to withdraw permanently from PCOP.
13. Students who drop a Work Term without prior approval from both ASM-CE and the Head of the Department of Psychology, or who fail to honour an agreement to work with an employer, or conduct themselves in such a manner as to cause their discharge from the job, will be awarded an overall grade of FAL for the Work Term in question and will be required to withdraw permanently from PCOP.
14. Permission to drop a Work Term does not constitute a waiver of degree requirements, and students who have obtained such permission must successfully complete an approved Work Term in lieu of the one dropped.

11.11.10 Suggested Course Sequences

The tables below show suggested course sequences for the [B.A. in Psychology \(Co-operative\)](#), the [B.Sc. in Psychology \(Co-operative\)](#), the [B.A. Honours in Psychology \(Co-operative\)](#), the [B.Sc. Honours in Psychology \(Co-operative\)](#), the [B.Sc. in Behavioural Neuroscience \(Co-operative\)](#), and the [B.Sc. Honours in Behavioural Neuroscience \(Co-operative\)](#).

Course patterns may vary. Students are encouraged to meet with the undergraduate coordinator early in their program in order to establish a course pattern that meets the requirements as set out in these regulations.

SECONDARY CALENDAR CHANGES

None anticipated

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Comments Received

Consultations Sought From

Grenfell Campus

| | |
|-----------------------------|----|
| Arts and Social Science | No |
| Fine Arts | No |
| Science and the Environment | No |

St. John's Campus

| | |
|--------------------------------|-----|
| Business | YES |
| Education | No |
| Engineering | No |
| Human Kinetics and Recreation | YES |
| Humanities and Social Sciences | No |
| Medicine | No |
| Music | No |
| Nursing | No |
| Pharmacy | YES |
| Science | No |
| Social Work | No |
| University Library | YES |

Labrador Institute

| | |
|------------------------------|----|
| Arctic and Subarctic Studies | No |
|------------------------------|----|

Marine Institute

LIBRARY REPORT

YES

Subject FW: Proposed Calendar Changes, Psychology Department– Consultation Request (2 Proposals)
From Oldford, Erin <eoldford@mun.ca>
To psychdeputyhead@mun.ca <psychdeputyhead@mun.ca>
Date 2021-10-27 11:18



- 5. Calendar Program Change_Psychology_Math.pdf (~240 KB)
- 6. Calendar_Change_Psychology 4920.pdf (~345 KB)

Hello – No questions from our office.

Best wishes!

Erin

Dr. Erin Oldford

Interim Associate Dean, Undergraduate Programs

Faculty of Business Administration

Memorial University of Newfoundland

Begin forwarded message:

From: "Deputy Head, Department of Psychology" <psychdeputyhead@mun.ca>

Date: October 25, 2021 at 4:19:40 PM NDT

To: Faculty of Humanities and Social Sciences <hss@mun.ca>, "Shannahan, Rachelle" <rshannahan@mun.ca>, "Furey, Edith" <efurey@mun.ca>, engrconsult@mun.ca, kjacobse@grenfell.mun.ca, ssedean@grenfell.mun.ca, thennessey@grenfell.mun.ca, HKR Dean <hkrdean@mun.ca>, Ashlee Cunsolo <ashlee.cunsolo@mun.ca>, miugconsultations@mi.mun.ca, deanofmedicine@med.mun.ca, Karen Bulmer <kbulmer@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: psychundergradadvisor@mun.ca

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Item "6. Calendar_Change_Psychology 4920.pdf" proposes a new 4000-level course in Psychological Testing. A Library Report has been requested.

I would appreciate any feedback prior to November 19th, 2021.

Many thanks,
 Carolyn

Subject Re: Proposed Calendar Changes, Psychology Department- Consultation Request (2 Proposals)
From HKR Dean <hkrdean@mun.ca>
To Deputy Head, Department of Psychology <psychdeputyhead@mun.ca>
Date 2021-10-28 13:30



Hello,

HKR has reviewed and has no concerns.

Anne-Marie

Anne-Marie Sullivan (she/her), PhD, CTRS
 Interim Dean, School of Human Kinetics & Recreation
 Memorial University, St. John's, NL, A1S 5S7
 (p) 709-864-8129; (e) hkrdean@mun.ca

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.

On 2021-10-25, 4:19 PM, "Deputy Head, Department of Psychology" <psychdeputyhead@mun.ca> wrote:

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 > Psychology. The items are, in brief, changes to:

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- > 1) 11.11.9 Suggested Course Sequences: Additions to Tables 4, 5, and 6
 > to clarify course progression options for students. This item was for
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 > omitted from the Calendar changes in error;
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 > the Co-operative Education office, the course descriptions for Work
 > Terms were simplified and brought in line with those of other programs
 > in the Faculty;
- >
- > 4) 12.11.2. Majors Courses Psychology 3800, 3820 4870. Add an "Other

Subject FW: Proposed Calendar Changes, Psychology Department- Consultation Request (2 Proposals)
From Davis,Erin <emdavis@mun.ca>
To psychdeputyhead@mun.ca <psychdeputyhead@mun.ca>
Date 2021-10-26 13:34



- 5. Calendar Program Change_Psychology_Math.pdf (~240 KB)
- 6. Calendar_Change_Psychology 4920.pdf (~345 KB)

Hi Dr. Walsh,

Thank you for the opportunity to comment on the proposed changes. We expect there to be no impact on Pharmacy and we 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

-----Original Message-----

From: Deputy Head, Department of Psychology [mailto:psychdeputyhead@mun.ca]

Sent: Monday, October 25, 2021 4:20 PM

To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Shannahan, Rachele <rshannahan@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; HKR Dean <hkrdean@mun.ca>; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@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: psychundergradadvisor@mun.ca

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I would appreciate any feedback prior to November 19th, 2021.

Many thanks,
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>

> 1) 11.11.9 Suggested Course Sequences: Additions to Tables 4, 5, and 6

Subject Proposed Calendar Changes
From Alcock, Erin <ekalcock@mun.ca>
To psychdeputyhead@mun.ca <psychdeputyhead@mun.ca>
Date 2021-11-09 16:47



Dr Walsh,

I am writing regarding the proposed calendar changes sent to the University Library on October 5 and the new course proposal from October 25, 2021.

As indicated, there are no library implications to the package of calendar changes.

Regarding the new course proposal, Psyc 4920: Psychological Testing, MUN Libraries has more than sufficient resources on the topics indicated in the tentative outline, with a health mix of print and electronic books, and of course numerous periodical subscriptions in that area. In terms of human resources, we also have a Research Data Management Librarian, Alison Farrell, who could potentially be a great source of support for the enrolled students.

If there are any questions, please let me know.

Best,

Erin Alcock

Erin Alcock
Science Research Liaison Librarian
QE2 Library
709-864-8316

Best,

Erin Alcock
Science Research Liaison Librarian
QE2 Library
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:

- New course(s): **PSYC 4920**
- 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 4920 Psychological Testing

ABBREVIATED COURSE TITLE

Psychological Testing

RATIONALE

The proposal for this course aims to meet multiple objectives. First, the Psychology Department would benefit from Psychology majors having another option for a 4000- level course to satisfy the degree requirement of four 4000-level courses. Second, this course provides Psychology students with the knowledge of how surveys – which are widely used in many areas of psychology research – are constructed and interpreted. Finally, this course offers a data management and analysis section specifically assessing the psychometric properties of psychological surveys which identifies specific statistical analyses that are not currently covered in great detail in other courses offered in the department.

CALENDAR CHANGES

4920 Psychological Testing focuses on the principles of psychological testing, relevant psychometric properties, and methods by which tests are developed. The course is designed to review the nature and use of psychological tests and will cover topics such as test norms, interpretability, reliability, item analysis, validity, and test development. This course includes a survey development and data management component where students will create and validate their own psychological survey.

PR: 6 CH in any 3000-level restricted Psychology courses and admission to a Major in Psychology or Behavioural Neuroscience.

CR: PSYC 3628

CALENDAR ENTRY AFTER CHANGES

4920 Psychological Testing focuses on the principles of psychological testing, relevant psychometric properties, and methods by which tests are developed. The course is designed to review the nature and use of psychological tests and will cover topics such as test norms, interpretability, reliability, item analysis, validity, and test development. This course includes a survey development and data management component where students will create and validate their own psychological survey.

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Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

Comments Received

Consultations Sought From

Grenfell Campus

Arts and Social Science

YES- Psychology

Fine Arts

No

Science and the Environment

No

St. John's Campus

Business

YES

Education

No

Engineering

No

Human Kinetics and Recreation

YES

Humanities and Social Sciences

No

Medicine

No

Music

No

Nursing

No

Pharmacy

YES

Science

No

Social Work

No

University Library

YES

Labrador Institute

Arctic and Subarctic Studies

No

Marine Institute

LIBRARY REPORT

YES

Subject FW: Proposed Calendar Changes, Psychology Department– Consultation Request (2 Proposals)
From Oldford, Erin <eoldford@mun.ca>
To psychdeputyhead@mun.ca <psychdeputyhead@mun.ca>
Date 2021-10-27 11:18



- 5. Calendar Program Change_Psychology_Math.pdf (~240 KB)
- 6. Calendar_Change_Psychology 4920.pdf (~345 KB)

Hello – No questions from our office.

Best wishes!

Erin

Dr. Erin Oldford
Interim Associate Dean, Undergraduate Programs
Faculty of Business Administration
Memorial University of Newfoundland

Begin forwarded message:

From: "Deputy Head, Department of Psychology" <psychdeputyhead@mun.ca>
Date: October 25, 2021 at 4:19:40 PM NDT
To: Faculty of Humanities and Social Sciences <hss@mun.ca>, "Shannahan, Rachelle" <rshannahan@mun.ca>, "Furey, Edith" <efurey@mun.ca>, engrconsult@mun.ca, kjacobse@grenfell.mun.ca, ssedean@grenfell.mun.ca, thennessey@grenfell.mun.ca, HKR Dean <hkrdean@mun.ca>, Ashlee Cunsolo <ashlee.cunsolo@mun.ca>, miugconsultations@mi.mun.ca, deanofmedicine@med.mun.ca, Karen Bulmer <kbulmer@mun.ca>, DeanNurse <DeanNurse@mun.ca>, pharminfo@mun.ca, Dean of Science <deansci@mun.ca>, adeanugradswk <adeanugradswk@mun.ca>, Library Correspondence <univlib@mun.ca>
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From HKR Dean <hkrdean@mun.ca>
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Date 2021-10-28 13:30



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Anne-Marie

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 Interim Dean, School of Human Kinetics & Recreation
 Memorial University, St. John's, NL, A1S 5S7
 (p) 709-864-8129; (e) hkrdean@mun.ca

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.

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Subject FW: Proposed Calendar Changes, Psychology Department- Consultation Request (2 Proposals)



From Davis, Erin <emdavis@mun.ca>

To psychdeputyhead@mun.ca <psychdeputyhead@mun.ca>

Date 2021-10-26 13:34

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Erin

--

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

-----Original Message-----

From: Deputy Head, Department of Psychology [mailto:psychdeputyhead@mun.ca]

Sent: Monday, October 25, 2021 4:20 PM

To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Shannahan, Rachele <rshannahan@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; HKR Dean <hkrdean@mun.ca>; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>; miugconsultations@mi.mun.ca; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>

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To psychdeputyhead@mun.ca <psychdeputyhead@mun.ca>
Date 2021-11-09 16:47



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If there are any questions, please let me know.

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Erin Alcock

Erin Alcock
Science Research Liaison Librarian
QE2 Library
709-864-8316

Best,

Erin Alcock
Science Research Liaison Librarian
QE2 Library
709-864-8316

From: Warren, Kelly kwarren@grenfell.mun.ca
Subject: Consultation for Program Changes - Tests and Measurements and sample courses
Date: November 19, 2021 at 5:09 PM
To: psychdeputyhead@mun.ca



Hi Carolyn,

Thanks for the opportunity to review these changes. We support them, but we do believe there should be a credit restriction with your new tests and measurements course and Psychology 3628 in our program: Contemporary Issues in Tests and Measurements. If you have any questions, just let me know.

Kelly

Kelly Warren, PhD
Associate Professor and Program Chair
Psychology Program
Grenfell Campus, Memorial University
20 University Drive
Corner Brook, NL
A2H 5G4

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS



Psychology 4920: Psychological Testing Fall 2022

Land Acknowledgement: *We respectfully acknowledge the territory in which we gather as the ancestral homelands of the Beothuk, and the island of Newfoundland as the ancestral homelands of the Mi'kmaq and Beothuk. We would also like to recognize the Inuit of Nunatsiavut and NunatuKavut and the Innu of Nitassinan, and their ancestors, as the original people of Labrador. We strive for respectful partnerships with all the peoples of this province as we search for collective healing and true reconciliation and honour this beautiful land together.*

Instructor: Cheryll Fitzpatrick, PhD

Email: cheryllf@mun.ca

Office: SN2077

Class time:

Teaching Assistant:

COURSE OVERVIEW

Welcome! This is a fourth-year lecture-based course introducing you to the principles of testing, relevant psychometric properties and methods by which tests are developed. This course is designed to provide you with a review of the nature and use of psychological tests. The ability to measure psychological phenomena is a major feature within psychological sciences. We will cover topics such as test norms, interpretability, reliability, item analysis, validity, and test development. You will also be creating and validating your own psychological survey.

Pre-requisites: Two 3000-level restricted Psychology courses and admission to a Major in Psychology or Behavioural Neuroscience

REQUIRED TEXT

Miller, L. A., & Lovler, R. L. (2018). *Foundations of Psychological Testing: A Practical Approach* (6th Ed). Sage: Thousand Oaks, California.

EVALUATION

| | |
|--------------------------------------------------|------------|
| Participation/Attendance/Discussion Posts | 10% |
| Midterms | 40% |
| Midterm I | 20% |

| | |
|----------------------|------------|
| Midterm II | 20% |
| Group Project | 50% |
| Proposal | 3% |
| First draft | 7% |
| Data analysis | 10% |
| Final submission | 30% |

*****All late submissions will receive a deduction of 10% for each day past due, with the exception of the final group project submission, which will not be accepted past the scheduled due date*****

All course materials (e.g., syllabus, assignments, etc.) can be

Participation: Your participation grade will be based on discussion questions. Class discussions will occur during class but also in the Brightspace platform via the Discussion Posts section. The section will also include your participation in your classmates' data collection for the purposes of conducting psychometric properties of your newly developed survey measure.

Midterms: Midterms will cover course material (e.g., lecture and textbook content). There will be two during the semester consisting of multiple-choice, matching items, and written responses.

Group project: This group project will span the entire semester and will consist of a series of submissions. You will be placed into a group with 4 of your peers (e.g., groups of 5) to research and create a survey to measure a psychological construct of your choosing. The selection of a psychological construct should be grounded in the existing literature. For example, is there is measure out there that measures people's attitudes towards public displays of affection?

Proposal: The first submission will be a 700-800 word proposal. It should cover the psychological construct of interest, operational definition, along with any related research on the topic. At this point you should also be considering other potential measures that can be included in your project for the sake of establishing the psychometric properties of your measure (e.g., constructs that shouldn't be correlated with the your groups' chosen construct and perhaps constructs that should be related to your chosen construct). This submission should be written using the current 7th edition of the APA manual with a reference page. You are required to have at least 5 peer-reviewed sources in this submission.

First Draft: Your first draft should include an additional 5 peer-reviewed sources for a total of *at least* 10 peer-reviewed sources. This submission should be no more than 5 pages and should end with the methods section. Your paper should have clearly outlined APA sections with a detailed methodology section and proposed section on data analysis. At this point your introduction should be mostly taken care of, with the exception of minor revisions or edits that may occur for the final draft. Your survey should be included in this submission.

Data Analysis: The data analysis portion of this assignment requires you to have your data collected for all survey measures included in your project, those being, your newly developed survey along with any survey measures used to determine psychometric properties (e.g., divergent, convergent, concurrent validity etc.) should be included in your Excel Spreadsheet file. The data file

should include participant data based on individual items in all surveys used. All data will be collected using the online data collection platform, Qualtrics. Your classmates will provide the data necessary for validating your measure.

Final Draft: The final draft will include the results of your survey data collection. Specifically, this section will demonstrate the analyses used to evaluate the data along with your results. Now that you have data analyzed you will need to include a discussion section to explain the outcomes of your results section and how your data fit into the existing literature. Your final paper should be between 8-12 pages. I won't read anything longer than 12 pages. Because this assignment is based on a page limit of text, I want all tables and figures included at the end in appendices. Your final submission should also include all survey measures.

Tentative Timeline

| Dates | Book Content | |
|----------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1-2 | Section I: Overview of Psychological Testing | Ch1: What are psychological tests? Ch2: Why is psychological testing important? Ch3: Ethical responsibilities |
| Week 2-8 | Section II: Psychometric Principles | Ch 4: How do test users interpret test scores? Ch 5: What is test reliability/precision? Ch 6-8: How do we gather evidence of validity based on the content of a test, test-criterion relationships, and on a test's relation to constructs? |
| Week 4 | | Group Project: Proposal |
| Week 5 | Midterm I | Ch 1-6 |
| Week 8-11 | Section III: Developing and Piloting Surveys and Psychological Tests. | Ch 9: How do we construct and administer surveys and use survey data? Ch 10: How do we develop a test? Ch 11: How do we assess the psychometric quality of a test? |
| Week 8 | | Group Project: First Draft |
| Week 10 | | Group Project: Data Analysis |
| Week 10 | Midterm II | Ch 7-11 |
| Week 12 | Section IV: Using Test in Different Settings | Ch 12: Educational settings Ch 13: Clinical and Counselling settings Ch 14: Organizational settings |
| TBD | | Group Project: Final Submission |

STUDENT ACCOMMODATIONS & ACADEMIC INTEGRITY

Memorial University of Newfoundland is committed to supporting inclusive education based on the principles of equity, accessibility and collaboration. Accommodations are provided within the scope of the University Policies for the Accommodations for Students with Disabilities (www.mun.ca/policy/site/policy.php?id=239). Students who may need an academic accommodation are asked to initiate the request

Students are expected to adhere to those principles which constitute proper academic conduct. A student has the responsibility to know which actions, as described under Academic Offences in the University Regulations, could be construed as dishonest or improper. Students found guilty of an academic offence may be subject to a number of penalties commensurate with the offence including reprimand, reduction of grade, probation, suspension or expulsion from the University. For more information regarding this policy, students should refer to the University Regulations for Academic Misconduct (Section 6.12) in the University Calendar.

There are plenty of other resources available to students:

Writing Centre (<http://www.mun.ca/writingcentre/>)

Student Wellness and Counselling Centre (<http://www.mun.ca/counselling/>)

Blundon Centre (blundon@mun.ca)

Centre for Innovation and Teaching (<https://blog.citl.mun.ca/resourcesforstudents/>)

General Regulations:

You are responsible for knowing and understanding the regulations and penalties concerning academic offenses. See the MUN University Calendar at <http://www.mun.ca/regoff/calendar/>. Violation of “proper conduct” (e.g., disruption of class, cheating, etc.) will result in your removal from the course and possible additional academic penalties. Additionally, a document is available on the Department's web site to inform students about plagiarism (<http://www.mun.ca/psychology/undergrad/Plagiarism.pdf>).

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s): MATH 1005
- 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

Mathematics 1005: Calculus for Business

ABBREVIATED COURSE TITLE

Calculus for Business

RATIONALE

The Faculty of Business Administration is going through a process of program renewal. As part of that program, they struck a committee to consider whether they should have more, less, or different mathematics in their programs. After discussions, they felt their students would be best served by a new version of our current MATH 1000: Calculus I course. Some topics currently included were felt to be not of use to current students, and some topics that would be useful were omitted. For example, there was little interest in including trigonometric, inverse trigonometric, and hyperbolic functions and their derivatives. There is interest, however, in including other topics, such as partial differentiation. Further, by isolating these students, it would be possible to deliver all the material of such a course with a “business slant.”

Historically, Business students have struggled with MATH 1000. In Fall 2019, the failure rate for MATH 1000 among in-person classes on the St. John’s campus was 30%. Amongst Business students, this rises to 46%. Similarly, in the online course offered from the St. John’s campus, the rates were 32% and 45%, respectively. It is hoped that having a dedicated course will not only better prepare them for their later courses in the Faculty of Business Administration, but allow them to concentrate on topics that are ideally more intrinsically interesting based on their chosen program of studies.

Specialized calculus courses exist at many other Canadian universities. Business calculus in particular is quite common; courses exist at Dalhousie, University of New Brunswick, Carleton, Waterloo, Guelph, and Simon Fraser, for example.

CALENDAR CHANGES

1005 Calculus for Business is an introduction to differential calculus, including algebraic, exponential, and logarithmic functions. Applications include related rates and optimization in a business context and partial differentiation. This is a terminal course, not intended for those planning on taking further calculus courses. Business students who plan to take further calculus courses should complete MATH 1000 instead of MATH 1005.

LC: 4

PR: MATH 1090 or 109B or a combination of placement test and high school Mathematics scores acceptable to the Department

UL: at most 9 credit hours in Mathematics will be given for courses successfully completed from the following list subject to normal credit restrictions: Mathematics 1000, 1005, 1031, 1050, 1051, the former 1080, the former 1081, 1090, 109A/B, the former 1150 and 1151

CALENDAR ENTRY AFTER CHANGES

1005 Calculus for Business is an introduction to differential calculus, including algebraic, exponential, and logarithmic functions. Applications include related rates and optimization in a business context and partial differentiation. This is a terminal course, not intended for those planning on taking further calculus courses. Business students who plan to take further calculus courses should complete MATH 1000 instead of MATH 1005.

LC: 4

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SECONDARY CALENDAR CHANGES

11.8.1 Regulations

1. At most 9 credit hours in Mathematics will be given for courses successfully completed from the following list subject to normal credit restrictions: Mathematics 1000, 1005, 1031, 1050, 1051, 1052, 1053, the former 1080, the former 1081, 1090, 109A/B, the former 1150 and 1151.

4. Placement in Mathematics 1000, 1005, 1050, 1051, 1090, and 109A/B, shall be determined by the Department of Mathematics and Statistics on the basis of the student's score on the Mathematics Placement Test (MPT), SAT Subject Test in Mathematics Level 1, or other acceptable criteria-based test.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

| Academic Unit | Response Received |
|----------------------------------------|--------------------------|
| Humanities and Social Sciences | |
| Business Administration | Yes |
| Education | |
| Engineering and Applied Science | |
| Human Kinetics and Recreation | |
| Marine Institute | |
| Medicine | |
| Music | |
| Nursing | |
| Pharmacy | Yes |
| Science | |
| Biochemistry | |
| Biology | |
| Computer Science | |
| Earth Sciences | |
| Mathematics and Statistics | |
| Ocean Sciences | |
| Physics and Physical Oceanography | |
| Psychology | |
| Social Work | |
| Library | |
| Grenfell - Arts and Social Science | |
| Grenfell - Science and the Environment | |

| Academic Unit | Response Received |
|----------------------|--------------------------|
| Grenfell - Fine Arts | |
| Labrador Institute | |

LIBRARY REPORT

RESOURCE IMPLICATIONS

None

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

See attached document

Proposal for MATH 1005: Calculus for Business

Executive Summary

We propose a new, terminal, first-year calculus course that will teach the basics of limits and differential calculus in a business context, for students from the Faculty of Business Administration.

Rationale

The Faculty of Business Administration is going through a process of program renewal. As part of that program, they struck a committee to consider whether they should have more, less, or different mathematics in their programs. After discussions, they felt their students would be best served by a new version of our current MATH 1000: Calculus I course. Some topics currently included were felt to be not of use to current students, and some topics that would be useful were omitted. For example, there was little interest in including trigonometric, inverse trigonometric, and hyperbolic functions and their derivatives. There is interest, however, in including other topics, such as partial differentiation. Further, by isolating these students, it would be possible to deliver all the material of such a course with a “business slant.”

Historically, Business students have struggled with MATH 1000. In Fall 2019, the failure rate for MATH 1000 among in-person classes on the St. John’s campus was 30%. Amongst Business students, this rises to 46%. Similarly, in the online course offered from the St. John’s campus, the rates were 32% and 45%, respectively. It is hoped that having a dedicated course will not only better prepare them for their later courses in the Faculty of Business Administration, but allow them to concentrate on topics that are ideally more intrinsically interesting based on their chosen program of studies.

Specialized calculus courses exist at many other Canadian universities. Business calculus in particular is quite common; courses exist at Dalhousie, University of New Brunswick, Carleton, Waterloo, Guelph, and Simon Fraser, for example.

Calendar description:

1005 Calculus for Business is an introduction to differential calculus, including algebraic, exponential, and logarithmic functions. Applications include related rates and optimization in a business context and partial differentiation. This is a terminal course, not intended for those planning on taking further calculus courses. Business students who plan to take further calculus courses should complete MATH 1000 instead of MATH 1005.

LC: 4

PR: MATH 1090 or 109B or a combination of placement test and high school Mathematics scores acceptable to the Department

UL: at most 9 credit hours in Mathematics will be given for courses successfully completed from the following list subject to normal credit restrictions: Mathematics 1000, 1005, 1031, 1050, 1051, the former 1080, the former 1081, 1090, 109A/B, the former 1150 and 1151

Sample Syllabus:

- Unit 0: Mathematical functions for Business (1 week)
- Unit 1: Limits and Continuity (3 weeks)
 - The Limit of a Function
 - Calculating Limits using Limit Laws
 - Evaluating Limits; Vertical Asymptotes
 - Continuity
 - Limits at Infinity; Horizontal Asymptotes
- Unit 2: Differentiation (3 weeks)
 - Tangent and Finance Problems
 - Derivatives
 - Derivatives of Polynomial and Exponential Functions
 - The Product and Quotient Rules
 - The Chain Rule
 - Implicit Differentiation
 - Derivatives of Logarithmic Functions
 - Higher Order Derivatives
- Unit 3: Applications (3 weeks)
 - Related Rates
 - Extreme Values
 - Absolute Extrema
 - Optimization Problems
 - L'Hopital's Rule (optional)
- Unit 4: Partial Differentiation (2 weeks)
 - Multivariable Functions
 - Limits and Continuity
 - Partial Derivatives
 - The Chain Rule
 - Extreme Values

Proposed Evaluation Scheme:

| | |
|--------------|-----|
| Assignments | 20% |
| Midterms (2) | 30% |
| Final Exam | 50% |

Possible Instructors: Anyone in the Department of Mathematics and Statistics

Suggested Texts: *Applied Calculus for the Managerial, Life, and Social Sciences*, by Soo Tan, supplemented by material provided by the Faculty of Business.

From: Oldford, Erin eoldford@mun.ca
Subject: FW: Four proposals from Mathematics and Statistics
Date: November 8, 2021 at 9:54 AM
To: mathconsult@mun.ca
Cc: Hooper, Denise deniseh@mun.ca

EO

Hello

We are pleased to see 1005 on the docket, and we are hopeful this is successful, as it reduces barriers for students! Otherwise, no comments.

Thanks,
Erin

*Dr. Erin Oldford
 Interim Associate Dean, Undergraduate Programs
 Faculty of Business Administration
 Memorial University of Newfoundland*

From: Math Consult <mathconsult@mun.ca>
Sent: November 3, 2021 3:54 PM
To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Oldford, Erin <eoldford@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; HKR Dean <hkrdean@mun.ca>; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; miugconsultations@mi.mun.ca; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>
Subject: Four proposals from Mathematics and Statistics

Hi all,

Four proposals from Mathematics and Statistics are attached for consultation. In summary, they are

Math 1005 - proposal of a new course: Calculus for Business
 Math 4250 - proposal of a new course: Reinforcement Learning
 Stats 2500 - change of prerequisites
 Stats 3585 - change of course description

Please send your feedback to mathconsult@mun.ca no later than November 30.

Best,
Graham

From: Davis, Erin emdavis@mun.ca 
Subject: FW: Four proposals from Mathematics and Statistics
Date: November 4, 2021 at 2:42 PM
To: mathconsult@mun.ca

ED

Hello Dr. Cox,

Pharmacy has no concerns with the proposed changes, thank you for the opportunity to comment on the proposals.

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 [<mailto:mathconsult@mun.ca>]
Sent: Wednesday, November 3, 2021 3:54 PM
To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Oldford, Erin <eoldford@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; HKR Dean <hkrdean@mun.ca>; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; miugconsultations@mi.mun.ca; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>
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Please send your feedback to mathconsult@mun.ca no later than November 30.

Best,
Graham

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s): MATH 4250
- 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

Mathematics 4250: Reinforcement Learning

ABBREVIATED COURSE TITLE

Reinforcement Learning

RATIONALE

This is a proposal for a new course in reinforcement learning. Reinforcement learning has seen a steady increase in applications to virtually all areas of science and engineering. Applications of reinforcement learning today include self-driving cars, (video) games, health care, engineering and robotics.

Due to the importance of reinforcement learning for industry, it has become one of the main required skill sets a graduate from an applied mathematics program needs to possess. The purpose of this course is thus to equip our graduating students with an in-depth understanding (both theoretically and practically) of this emerging field of machine learning.

CALENDAR CHANGES

4250 Reinforcement Learning considers a mathematical framework in which an agent (such as a person or a robot) learns which actions to take in an environment in order to maximize a specific reward signal. The course provides an introduction to reinforcement learning, including tabular solution methods, dynamic programming, Monte Carlo methods, temporal-difference learning, planning methods and approximate solution methods.

PR: MATH 2051, MATH 3132, STAT 2550.

CALENDAR ENTRY AFTER CHANGES

4250 Reinforcement Learning considers a mathematical framework in which an agent (such as a person or a robot) learns which actions to take in an environment in order to maximize a specific reward signal. The course provides an introduction to reinforcement learning, including tabular solution methods, dynamic programming, Monte Carlo methods, temporal-difference learning, planning methods and approximate solution methods.

PR: MATH 2051, MATH 3132, STAT 2550.

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 | |
| Human Kinetics and Recreation | |
| Marine Institute | |
| Medicine | |
| Music | |
| Nursing | |
| Pharmacy | Yes |
| Science | |
| Biochemistry | |
| Biology | |
| Computer Science | |
| Earth Sciences | |
| Mathematics and Statistics | |
| Ocean Sciences | |
| Physics and Physical Oceanography | |
| Psychology | |
| Social Work | |
| Library | |
| Grenfell - Arts and Social Science | |
| Grenfell - Science and the Environment | |

| Academic Unit | Response Received |
|----------------------|--------------------------|
| Grenfell - Fine Arts | |
| Labrador Institute | |

LIBRARY REPORT

RESOURCE IMPLICATIONS

None

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

See attached document

MATH 4250: Reinforcement learning

Introduction: Reinforcement learning is a learning paradigm that states that one learns by interacting with the environment in which one is in, rather than by being provided explicit rules to follow. Specifically, reinforcement learning states that an *agent* (e.g. a human or a robot) learns which actions to take in the *environment* so as to maximize a specific *reward* signal. That is, the agent initially has no information about the set of desirable actions to take and only learns them gradually by interacting with its environment.

Rationale: Reinforcement learning has seen a steady increase in application fields in virtually all areas of science and engineering. Applications of reinforcement learning today include self-driving cars, (video) games, health care, engineering and robotics.

Due to the importance of reinforcement learning for industry, it has become one of the main required skill sets a graduate from an applied mathematics program needs to possess. The purpose of this course is thus to equip our graduating students with an in-depth understanding (both theoretically and practically) of this emerging field of machine learning.

Objectives: This course will provide an introduction to classical and modern methods of reinforcement learning, including dynamic programming, Monte Carlo methods, Temporal-Difference learning, planning methods, approximate solution methods, policy gradient methods and deep reinforcement learning.

Calendar description: MATH 4250 considers a mathematical framework in which an agent (such as a person or a robot) learns which actions to take in an environment in order to maximize a specific reward signal. The course provides an introduction to reinforcement learning, including tabular solution methods, dynamic programming, Monte Carlo methods, temporal-difference learning, planning methods and approximate solution methods.

Prerequisites: MATH 2051, MATH 3132, STAT 2550.

Potential instructors: Alex Bihlo, Armin Hatefi, JC Loredó-Osti, Hamid Usefi.

Literature: The following books are either publicly available or available through our library. The main textbook will be *Sutton and Barto, 2018*.

- R.S. Sutton and A.G. Barto. *Reinforcement learning*, MIT press, 2018 (available online)
- C. Szepesvari. *Algorithms for Reinforcement Learning*, Morgan & Claypool, 2010 (available online)

Tentative syllabus (*in brackets are chapters from Sutton and Barto, 2018*):

1. *Multi-armed bandits*
 - (a) Action-value methods (*2.1–2.3*)
 - (b) The exploration–exploitation dilemma (*2.4–2.6*)
2. *Dynamic programming*
 - (a) An introduction to finite Markov decision processes (*3.1–3.3, 3.5–3.6*)
 - (b) Generalized policy iteration (*4.1–4.4, 4.6*)
 - (c) Asynchronous dynamic programming (*4.5*)
3. *Monte Carlo methods*
 - (a) On-policy Monte Carlo methods (*5.1–5.4*)

- (b) Off-policy Monte Carlo methods (5.5–5.7)
- 4. *Temporal-Difference learning*
 - (a) TD reinforcement learning (6.1–6.3)
 - (b) SARSA and Q-learning (6.4–6.5)
 - (c) n -step bootstrapping methods (7.1–7.3)
- 5. *Planning methods*
 - (a) Models and planning (8.1–8.3)
 - (b) Prioritized sweeping (8.4)
 - (c) Real-time dynamic programming (8.7–8.9)
 - (d) Monte Carlo tree search (8.11)
- 6. *Approximate solution methods and deep reinforcement learning*
 - (a) Linear methods and feature construction (9.1–9.4)
 - (b) A short introduction to deep neural networks (9.7)
 - (c) Deep Q-learning and applications to video and board games (16.5)
- 7. *Policy gradient methods*
 - (a) The policy gradient theorem (13.1–13.2)
 - (b) Monte Carlo policy gradient (13.3–13.4)
 - (c) Actor–Critic methods (13.5)

Evaluation: The suggested grading scheme will consist of:

- *Assignments:* 30%. One assignment every 2 weeks, which includes both analytical and numerical components.
- *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.

From: Davis, Erin emdavis@mun.ca 
Subject: FW: Four proposals from Mathematics and Statistics
Date: November 4, 2021 at 2:42 PM
To: mathconsult@mun.ca



Hello Dr. Cox,

Pharmacy has no concerns with the proposed changes, thank you for the opportunity to comment on the proposals.

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 [<mailto:mathconsult@mun.ca>]
Sent: Wednesday, November 3, 2021 3:54 PM
To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Oldford, Erin <eoldford@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; HKR Dean <hkrdean@mun.ca>; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; miugconsultations@mi.mun.ca; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>
Subject: Four proposals from Mathematics and Statistics

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 Stats 2500 - change of prerequisites
 Stats 3585 - change of course description

Please send your feedback to mathconsult@mun.ca no later than November 30.

Best,
 Graham

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s): STAT 2500
- New program(s):
- Amended or deleted program(s):
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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

COURSE NUMBER AND TITLE

Statistics 2500: Statistics for Business and Arts Students

RATIONALE

This is a proposal to modify the prerequisites to Statistics 2500, and thus remove unnecessary barriers to students who wish to take this course. The Department of Mathematics and Statistics has agreements with some faculties (Nursing, HKR, MI, BTECH) to allow students who do not satisfy the Mathematics courses prerequisites to take Statistics 2500. Thus, each term a significant number of students are allowed to take Statistics 2500 although the prerequisite requirement is not satisfied. The Statistics faculty do not observe any significant disadvantage of not having the prerequisite Mathematics courses completed on learning Statistics 2500 course contents. The Statistics faculty would like to remove unnecessary barriers to Statistics 2500 as suggested in the recent Faculty of Science Strategic Planning and keep the prerequisite requirement at the minimum level.

CALENDAR CHANGES

2500 Statistics for Business and Arts Students covers descriptive statistics (including histograms, stem-and-leaf plots and box plots), elementary probability, random variables, the binomial distribution, the normal distribution, sampling distribution, estimation and hypothesis testing including both one and two sample tests, paired comparisons, correlation and regression, related applications.

CR: STAT 2550, the former 2510, Psychology 2910, 2925 and the former 2900

LH: one 90 minute lab per week. Statistical computer package will be used in the laboratory, but no prior computing experience is assumed

PR: ~~Mathematics 1000 or 6 credit hours in first year courses in Mathematics or registration in at least semester three of a Bachelor of Nursing program or permission of the Head of Department~~ A combination of placement test and high school Mathematics scores acceptable to the Department

CALENDAR ENTRY AFTER CHANGES

2500 Statistics for Business and Arts Students covers descriptive statistics (including histograms, stem-and-leaf plots and box plots), elementary probability, random variables, the binomial distribution, the normal distribution, sampling distribution, estimation and hypothesis testing including both one and two sample tests, paired comparisons, correlation and regression, related applications.

CR: STAT 2550, the former 2510, Psychology 2910, 2925 and the former 2900

LH: one 90 minute lab per week. Statistical computer package will be used in the laboratory, but no prior computing experience is assumed

PR: A combination of placement test and high school Mathematics scores acceptable to the Department

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 | |
| Human Kinetics and Recreation | |
| Marine Institute | |
| Medicine | |
| Music | |
| Nursing | Yes |
| Pharmacy | Yes |
| Science | |
| Biochemistry | |
| Biology | |
| Computer Science | |
| Earth Sciences | |
| Mathematics and Statistics | |
| Ocean Sciences | |
| Physics and Physical Oceanography | |
| Psychology | |
| Social Work | |
| Library | |
| Grenfell - Arts and Social Science | |
| Grenfell - Science and the Environment | |

| Academic Unit | Response Received |
|----------------------|--------------------------|
| Grenfell - Fine Arts | |
| Labrador Institute | |

LIBRARY REPORT**RESOURCE IMPLICATIONS**

None

From: Davis, Erin emdavis@mun.ca 
Subject: FW: Four proposals from Mathematics and Statistics
Date: November 4, 2021 at 2:42 PM
To: mathconsult@mun.ca

ED

Hello Dr. Cox,

Pharmacy has no concerns with the proposed changes, thank you for the opportunity to comment on the proposals.

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 [<mailto:mathconsult@mun.ca>]
Sent: Wednesday, November 3, 2021 3:54 PM
To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Oldford, Erin <eoldford@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; HKR Dean <hkrdean@mun.ca>; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; miugconsultations@mi.mun.ca; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>
Subject: Four proposals from Mathematics and Statistics


Hi all,

Four proposals from Mathematics and Statistics are attached for consultation. In summary, they are

Math 1005 - proposal of a new course: Calculus for Business
Math 4250 - proposal of a new course: Reinforcement Learning
Stats 2500 - change of prerequisites
Stats 3585 - change of course description

Please send your feedback to mathconsult@mun.ca no later than November 30.

Best,
Graham

From: Gaudine, Alice agaudine@mun.ca 
Subject: FW: Four proposals from Mathematics and Statistics
Date: November 4, 2021 at 5:15 PM
To: mathconsult@mun.ca



Hello Dr. Graham Cox,

Re the change in pre-requisites for Stats 2500, I am wondering if this will increase enrollment and make it difficult for nursing students to be able to register for the course? This is a required course in the Nursing curriculum, and we have 85 undergraduate nursing students at the Faculty of Nursing, and 136 nursing students at the Centre for Nursing Studies. Some of these students up to and including Spring 2021 took a statistics course from the Faculty of Education instead of Stats 2500. However, I understand that Education plans to prioritise their students and not offer a section in the future, if it is not required for education students.

Also, given that students who take Stat2500 are from a variety of schools/faculties, I wonder if the name "Statistics for Business and Arts students" could be reconsidered. For example, "Statistics for students in professional schools and arts"?

Thank you,

Alice Gaudine
 Dean, Faculty of Nursing

From: Math Consult <mathconsult@mun.ca>
Sent: Wednesday, November 3, 2021 3:54 PM
To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Oldford, Erin <eoldford@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; HKR Dean <hkrdean@mun.ca>; deanofmedicine@med.mun.ca; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; pharminfo@mun.ca; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Library Correspondence <univlib@mun.ca>; kjacobse@grenfell.mun.ca; ssedean@grenfell.mun.ca; thennessey@grenfell.mun.ca; miugconsultations@mi.mun.ca; Ashlee Cunsolo <ashlee.cunsolo@mun.ca>
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Math 1005 - proposal of a new course: Calculus for Business
 Math 4250 - proposal of a new course: Reinforcement Learning
 Stats 2500 - change of prerequisites
 Stats 3585 - change of course description

Please send your feedback to mathconsult@mun.ca no later than November 30.

-

From: Math Consult mathconsult@mun.ca
Subject: Re: Four proposals from Mathematics and Statistics
Date: November 11, 2021 at 4:50 PM
To: Gaudine, Alice agaudine@mun.ca



Hi Alice,

Thanks for your feedback on this proposal. We do not expect this to cause significant changes to enrolment; the main purpose is to streamline the entry process for the course and reduce the administrative burden, since many students will no longer require prerequisite waivers. In addition, there is room in our current sections of 2500 to accommodate additional students, should the enrolment increase. Do you know how many of your students took the Education course instead of Stats 2500?

I agree that the name is somewhat outdated, though I think it's too late to consider changing it for next year's calendar. I will pass on your suggestion to the statistics group and get their feedback on it.

Best,
 Graham

Dr. Graham Cox (he/him)
 Assistant Professor
 Deputy Head (Undergraduate)
 Department of Mathematics and Statistics
 Memorial University of Newfoundland

On Nov 4, 2021, at 5:15 PM, Gaudine, Alice <agaudine@mun.ca> wrote:

Hello Dr. Graham Cox,

Re the change in pre-requisites for Stats 2500, I am wondering if this will increase enrollment and make it difficult for nursing students to be able to register for the course? This is a required course in the Nursing curriculum, and we have 85 undergraduate nursing students at the Faculty of Nursing, and 136 nursing students at the Centre for Nursing Studies. Some of these students up to and including Spring 2021 took a statistics course from the Faculty of Education instead of Stats 2500. However, I understand that Education plans to prioritise their students and not offer a section in the future, if it is not required for education students.

Also, given that students who take Stat2500 are from a variety of schools/faculties, I wonder if the name "Statistics for Business and Arts students" could be reconsidered. For example, "Statistics for students in professional schools and arts"?

Thank you,

Alice Gaudine
 Dean, Faculty of Nursing

From: Math Consult <mathconsult@mun.ca>
Sent: Wednesday, November 3, 2021 3:54 PM
To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Oldford, Erin <eoldford@mun.ca>; Furey, Edith <efurey@mun.ca>; engrconsult@mun.ca; HKR Dean <hkrdean@mun.ca>; deanofmedicine@med.mun.ca; Karen Bulmer

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s): STAT 3585
- 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

Statistics 3585: Computational Statistics

RATIONALE

The contents in the current course description of Statistics 3585 are missing some important computational statistics topics: simulation techniques including random number generation methods, Monte Carlo evaluation of statistical procedures, resampling methods, and numerical techniques including root finding and optimization. The proposed course contents have been added to better reflect the aim of the course. As a result, students will have a more comprehensive and a better understanding of computational statistics.

Statistics 2410 knowledge is necessary for the added topics and therefore it is added as a prerequisite of Statistics 3585. Mathematics 2000 is removed from prerequisites, as it is already a prerequisite of Statistics 2410.

CALENDAR CHANGES

3585 Computational Statistics is an introduction to modern computational statistics, using a programming language which implements S. Emphasis will be placed on the development of algorithms and programs for generating random numbers, numerical techniques and programs for graphical exploratory data analysis, ~~and for~~ implementing specialized statistical procedures, Monte Carlo simulation and resampling.

PR: ~~Mathematics 2000~~ STAT 2410, STAT 2560

CALENDAR ENTRY AFTER CHANGES

3585 Computational Statistics is an introduction to modern computational statistics, using a programming language which implements S. Emphasis will be placed on the development of algorithms and programs for generating random numbers, numerical techniques and programs for graphical exploratory data analysis, implementing specialized statistical procedures, Monte Carlo simulation and resampling.

PR: STAT 2410, STAT 2560

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 | |
| Human Kinetics and Recreation | |
| Marine Institute | |
| Medicine | |
| Music | |
| Nursing | |
| Pharmacy | Yes |
| Science | |
| Biochemistry | |
| Biology | |
| Computer Science | |
| Earth Sciences | |
| Mathematics and Statistics | |
| Ocean Sciences | |
| Physics and Physical Oceanography | |
| Psychology | |
| Social Work | |
| Library | |
| Grenfell - Arts and Social Science | |
| Grenfell - Science and the Environment | |

| Academic Unit | Response Received |
|----------------------|--------------------------|
| Grenfell - Fine Arts | |
| Labrador Institute | |

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None

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Erin Davis, PharmD
Associate Dean Undergraduate Studies
Associate Professor
Memorial University School of Pharmacy
T 709 864 8815
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From: Math Consult [<mailto:mathconsult@mun.ca>]
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Stats 3585 - change of course description

Please send your feedback to mathconsult@mun.ca no later than November 30.

Best,
Graham

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s):
- New program(s):
- Amended or deleted program(s):
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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

COURSE NUMBER AND TITLE

Bioc 2200 Introduction to Molecular Biology and Genetics

Bioc 2201 Introduction to Biochemistry

Bioc 4210 Biochemical Research Techniques I

RATIONALE

Bioc 2200 and Bioc 2201:

The Chemistry department is in the process of changing the prerequisites for Chemistry 2400, which will affect two Biochemistry courses (2200 and 2201). Currently, Chemistry 1051 is a PR for Chemistry 2400, but is to be changed to a co-requisite. We intend to add Chemistry 1051 as a prerequisite to Bioc 2200 and Bioc 2201 to ensure that students have successfully completed Chemistry 1051 (or the equivalent Chemistry 1001 from Grenfell) before they take either of these two Biochemistry courses.

Bioc 4210:

An error was made when we did the secondary calendar changes related to our new lab courses and newly numbered lecture courses. The only necessary PR for Bioc 4210 is Bioc 3105; the phrase “or 3206” was added in error. Subsequently (for reasons unknown), “or 3206 (or 3106)” was added. Neither of these courses are necessary prerequisites for 4210 and should be removed.

CALENDAR CHANGES

2200

Introduction to Molecular Biology and Genetics will cover the heritability of simple traits from phenotype to genotype; the discovery of DNA as the molecule of heredity; the structure and function of DNA; the manipulation of DNA for recombinant DNA technology and biotechnology; and briefly, pharmacogenetics. Biology students should normally take Biology 2250 in the Fall semester, and Biochemistry and Biochemistry (Nutrition) students should normally take BIOC 2200 in Winter semester.

CO: Chemistry 2400

CR: BIOC 2100, Biology 2250

PR: Chemistry 1001 or 1051

2201

Introduction to Biochemistry (same as the former BIOC 2101) is an introduction to the major organic substances of living organisms, proteins, carbohydrates and lipids: their structure, analysis and biochemical function. Other topics include: enzymes; the biochemistry of membranes, including the plasma membrane and specialized intracellular membranes; and the biochemistry of selected differentiated cells.

CO: Physics 1021 or 1051

CR: the former BIOC 2101, Pharmacy 2004, or the former Pharmacy 3110

PR: Chemistry 1001 or 1051, Chemistry 2400 and Physics 1020 or 1050

4210

Biochemical Research Techniques I examines the proteome and the genome. This course is designed to familiarize students with current methodology employed in the analyses of the complements of proteins and genes resident in eukaryotic cells. Emphasis will be placed on techniques that facilitate the simultaneous functional analyses of large numbers of proteins or genes. A variety of techniques, used in the study of expression and functional proteomics, will be described, including 2D PAGE, tagged proteins, fluorophores, mass spectrometry and protein microarrays. Techniques used in the study of gene expression and functional genomics will also be described, including the use of reporter gene constructs, analysis of protein-DNA interactions, expressions of cloned genes and several experimental approaches used to define the eukaryotic transcriptome.

AR: attendance is required

PR: BIOC 3105 ~~or 3206 (or 3106)~~

CALENDAR ENTRY AFTER CHANGES**2200**

Introduction to Molecular Biology and Genetics will cover the heritability of simple traits from phenotype to genotype; the discovery of DNA as the molecule of heredity; the structure and function of DNA; the manipulation of DNA for recombinant DNA technology and biotechnology; and briefly, pharmacogenetics. Biology students should normally take Biology 2250 in the Fall semester, and Biochemistry and Biochemistry (Nutrition) students should normally take BIOC 2200 in Winter semester.

CO: Chemistry 2400

CR: BIOC 2100, Biology 2250

PR: Chemistry 1001 or 1051

2201

Introduction to Biochemistry (same as the former BIOC 2101) is an introduction to the major organic substances of living organisms, proteins, carbohydrates and lipids: their structure, analysis and biochemical function. Other topics include: enzymes; the biochemistry of membranes, including the plasma membrane and specialized intracellular membranes; and the biochemistry of selected differentiated cells.

CO: Physics 1021 or 1051

CR: the former BIOC 2101, Pharmacy 2004, or the former Pharmacy 3110

PR: Chemistry 1001 or 1051, Chemistry 2400 and Physics 1020 or 1050

4210

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AR: attendance is required

PR: BIOC 3105

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

COURSE NUMBER AND TITLE

Bioc 4240 Nutrigenetics and Nutrigenomics

REVISED COURSE NUMBER AND TITLE

Bioc 4240 Gene-Nutrient Interactions and Personalized Nutrition

ABBREVIATED COURSE TITLE

Gene-Nutr Inter'n & Pers Nutr

RATIONALE

The rationale for the change is to modernize the name to reflect how this nutrition research discipline has advanced (rapidly) to the point of being routinely adopted into some aspects of clinical practice. The new name is also more straightforward in describing the course content.

In addition, the course prerequisites will be updated to correct an error. It currently lists BIOC 2100 as a PR, but 2100 changed to BIOC 2200 a few years ago. It was an oversight that the PR for this course was not included in the secondary calendar changes at that time.

CALENDAR CHANGES

~~4240 Nutrigenetics and Nutrigenomics~~ Gene-Nutrient Interactions and Personalized Nutrition is designed to familiarize students with emerging discoveries in the area of diet-gene interaction and to further their understanding of the relationships between the genome and diet as well as the potential to design personalized diets for better health. Students will develop an appreciation for the role of nutrients in the prevention and/or development of disease.

PR: one of BIOC 2100, 2200 or Biology 2250; BIOC 3106 or BIOC 3206; and one of BIOC 3203 or the former BIOC 3200

CALENDAR ENTRY AFTER CHANGES

4240 Gene-Nutrient Interactions and Personalized Nutrition is designed to familiarize students with emerging discoveries in the area of diet-gene interaction and to further their understanding of the relationships between the genome and diet as well as the potential to design personalized diets for better health. Students will develop an appreciation for the role of nutrients in the prevention and/or development of disease.

PR: one of BIOC 2100, 2200 or Biology 2250; BIOC 3106 or BIOC 3206; and one of BIOC 3203 or the former BIOC 3200

Memorial University of Newfoundland

Undergraduate Calendar Change Proposal Form

Appendix Page

Note: Consultation email was sent on Oct 22, and feedback was requested by Nov 19th. The table below includes feedback received up to Nov 10

CONSULTATIONS SOUGHT

| Academic Unit | Response Received and Date |
|----------------------------------------|----------------------------|
| Business Administration | Yes; Date: 10/25/2021 |
| Chemistry | No |
| School of Music | No |
| Computer Science | No |
| Mathematics and Statistics | No |
| Ocean Sciences | No |
| Psychology | No |
| Biology | No |
| Physics | No |
| Humanities and Social Sciences | No |
| Geography | No |
| Human Kinetics and Recreation | Yes; Date: 10/28/2021 |
| Pharmacy | Yes; Date: 10/25/2021 |
| Nursing | No |
| Arts and Social Sciences (Grenfell) | No |
| Science and the Environment (Grenfell) | Yes; Date: 10/25/2021 |
| Fine Arts (Grenfell) | No |
| Marine Institute | No |
| Medicine | No |
| Engineering | Yes; Date: 10/27/2021 |
| Education | No |

Consultation feedback is attached.

LIBRARY REPORT

.Feedback received 10/25/2021; no implications for library resources.

Consultation on Calendar Changes: Biochemistry

HKR Dean

Thu 10/28, 1:34 PM

Hello,

HKR has reviewed and has no concerns.

Anne-Marie

Anne-Marie Sullivan (she/her), PhD, CTRS
Interim Dean, School of Human Kinetics & Recreation
Memorial University, St. John's, NL, A1S 5S7
(p) 709-864-8129; (e) hkrdean@mun.ca

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.

Engineering Consult <enrconsult@mun.ca>

Wed 10/27, 3:12 PM

Dear Dr. Brunton,

Thank you for the opportunity to respond to your below consultation request.

The FEAS notes that this will facilitate future planned program changes to Process Engineering major. We are happy to support this request with thanks.

Best regards,
Bruce

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

Bailey, Robert F. <rbailey@grenfell.mun.ca>

Mon 10/25, 4:11 PM

Dear Janet,

The proposed Calendar changes from Biochemistry have been forwarded to me. The changes sound reasonable and have no effect on the School of Science and the Environment at Grenfell Campus, and we are happy to support the changes. We especially appreciate the inclusion of CHEM 1001 as an alternative to CHEM 1051.

Thank you for the opportunity to comment on this proposal.

Regards,
Robert Bailey
Chair, Committee on Academic Programming
School of Science and the Environment

=====

Dr. Robert Bailey
Associate Professor, Mathematics
Chair, General Science program
School of Science and the Environment
Grenfell Campus
Memorial University of Newfoundland
Corner Brook, NL A2H 6P9, Canada

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

Ambi, Alison

Mon 10/25, 3:47 PM

Hello Janet,

The proposed calendar changes will have no implications for library resources.

Sincerely,
Alison

Alison Ambi

+1 709 864-7125

Interim Associate Dean of Libraries, Memorial University of Newfoundland

- **Library IT**
- **QEII Library:** Archives & Special Collections, Cataloguing & Metadata, Centre for Newfoundland Studies, Collection Strategies, Serials & Acquisitions
- **Health Sciences Library**
- **Marine Institute** (Dr. C.R. Barrett Library)

www.library.mun.ca

Davis, Erin

Mon 10/25, 12:17 PM

Bioc 2200 and 2201 cale...
15 KB

Bioc 4240 Name chang...
14 KB

2 attachments (29 KB) Download all

Hello Dr. Brunton,

Thank you for the opportunity to comment on the proposed calendar changes. We have no concerns about the proposed changes to BIOC 2200 or 4240, but I do have a question about the change to PHAR 2201.

Pharmacy has a course that is credit-restricted with BIOC 2201: PHAR 2204 Introduction to Biochemistry. Our students take this course through biochemistry.

Is it the intention of the Biochemistry department to make a similar change to the PHAR 2004 course? I didn't note any secondary calendar changes in the proposal but may have missed them.

Our students must have CHEM 1050 and 1051 (or equivalent) completed in order to be admitted to the pharmacy program, and are required to successfully complete CHEM 2400 in the semester preceding PHAR 2004, so this should not pose a problem for our students either way.

Thanks,
Erin

--

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

Oldford, Erin

Mon 10/25, 10:45 AM

Hello – can you please swap me in for Rachelle as the FBA's undergraduate contact?

Thanks,
Erin

Erin Oldford, PhD
Interim Associate Dean, Undergraduate Programs
Memorial University
Faculty of Business Administration

Dean of Science

Mon 10/25, 8:31 AM

Bioc 2200 and 2201 cale...
15 KBBioc 4240 Name chang...
14 KB

2 attachments (29 KB) Download all

BiocDHundergrad

Reply all |

Fri 10/22, 5:54 PM

jbrunton@mun.ca; engrconsult@mun.ca; Faculty of Humanities and Social Sciences; Shannahan, Rachele; Furey, Edith; HKR Dean; +12 more

Bioc 2200 and 2201 cale...
15 KBBioc 4240 Name chang...
14 KB

2 attachments (29 KB) Download all

Hello All,

We are seeking consultation on calendar changes proposed for four Biochemistry courses. The summary of proposed changes is provided below for your convenience. Kindly provide feedback by November 19th. Thanks very much!
Janet

The rationale for the proposed calendar changes are as follows:

Bioc 2200 and Bioc 2201:

The Chemistry department is in the process of changing the prerequisites for Chemistry 2400, which will affect two Biochemistry courses (2200 and 2201). Currently, Chemistry 1051 is a PR for Chemistry 2400 but is to be changed to a co-requisite. We intend to add Chemistry 1051 as a prerequisite to Bioc 2200 and Bioc 2201 to ensure that students have successfully completed Chemistry 1051 (or the equivalent Chemistry 1001 from Grenfell) before they take either of these two Biochemistry courses.

Bioc 4210:

An error was made when we did the secondary calendar changes related to our new lab courses and newly numbered lecture courses that resulted in the addition of unnecessary PR courses. This needs to be corrected.

Bioc 4242:

We are proposing to change the course name from "Nutrigenetics and Nutrigenomics" to "Gene-Nutrient Interactions and Personalized Nutrition". This will modernize the name to reflect how this nutrition research discipline has advanced (rapidly) to the point of being routinely adopted into some aspects of clinical practice.

.....
Janet Brunton, PhD
Professor and Deputy Head (Undergraduate)
Department of Biochemistry
Memorial University of Newfoundland
St. John's, NL, A1B 3X9, Canada

phone 709 864-8533 fax: 709 864-2422

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s):
- New program(s):
- Amended or deleted program(s):
- New, amended or deleted Glossary of Terms Used in the Calendar entries
- New, amended or deleted Admission/Readmission to the University (Undergraduate) regulations
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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 Programs

PROGRAM TITLE

11.4.9 Co-operative Internship in Computer Science (CICS)

12.4.3 Third Year Courses

RATIONALE

The proposed changes include some housekeeping items as well as the deletion of the section related to work term evaluation, which is excessively detailed and is better placed within the course syllabus. The updated language should improve student clarity and better align this co-op program section with other co-op programs in Science (and HSS).

CALENDAR CHANGES

11.4.9 Co-operative Internship in Computer Science (CICS)

www.mun.ca/coop

The Co-operative Internship in Computer Science (CICS) provides an opportunity for qualified students to obtain rewarding placements ~~placements~~ co-operative internships 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. Admission to the CICS is limited and competitive.

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 or beyond;
4. must have at least 15 credit hours remaining after the co-operative internship in order to satisfy degree requirements, 3 credit hours of which must be in Computer Science; and
5. is expected to return to University as a full-time student after the co-operative internship.

In addition to the above, admission is also subject to academic performance.

~~11.4.9.2 Internship Duration~~

~~Subject to the availability of job openings, a student may choose either an 8, 12 or 16 consecutive month internship period.~~

~~11.4.9.3~~ Co-operative Internship Guidelines

- ~~1. Internship employment is normally organized by Co-operative Education; however, students who have been accepted to the CICS may also obtain their own internship placements. All placements are subject to the approval of Co-operative Education and of the Head of the Department of~~

~~Computer Science-~~ General management of the CICS is the responsibility of Academic Staff Member(s) in Co-operative Education (ASM-CE). ASMs-CE are responsible for developing employment opportunities, organizing competitions for co-operative internship employment, co-operative education data management, monitoring students during co-operative internships, and evaluating co-operative internships.

2. Subject to the availability of appropriate co-operative internship employment, a student may complete a co-operative internship of 8, 12 or 16 consecutive months with a single employer. Co-operative internships are full-time, paid, and involve work that is relevant to the discipline of computer science.
3. The co-operative internship start and end dates are listed at www.mun.ca/coop/
4. Students are ultimately responsible for securing their co-operative internship. ASMs-CE provide support for the job search and inform students of potential opportunities.
5. Students who ~~have applied~~ are admitted to the co-operative internship program give permission to Co-operative Education ASMs-CE to supply prospective employers with copies of their resume and transcript.
6. A student who has been admitted to the CICS may independently obtain a co-operative internship in consultation with an ASM-CE. Such employment positions must satisfy the criteria for co-operative internships, be confirmed in writing by the employer and approved by an ASM-CE before the first day of the work term.
7. Students must register for the course Computer Science 3700 every semester during their co-operative internship. Computer Science 3700 is considered a full-time course load.
8. After being placed with an employer, sStudents are not permitted to drop their co-operative internship without prior approval from Co-operative Education an ASM-CE and the Head of the Department of Computer Science. Students who drop an a co-operative internship without permission, who fail to honour an agreement to work with an employer, or who conduct themselves in such a manner as to cause their discharge from the placements co-operative internship, will normally be awarded a fail grade for the co-operative internship period and may not be permitted to reapply to the CICS.

Note:

Students should also refer to the **UNIVERSITY REGULATIONS - General Academic Regulations**

(Undergraduate).

11.4.9.4 Registration, Assessment of Performance, and Assignment of Grades

~~Students must register for the course Computer Science 3700 every semester during their internship. Computer Science 3700 is a non-credit course open only to students who have been accepted into the Internship Program.~~

~~During the internship, the employer and intern will complete student performance evaluations every four months and will submit them to Co-operative Education. The final assessment of total work performed is the responsibility of Co-operative Education, and will be based upon both input from the employer and the intern's report(s).~~

~~The Internship evaluation shall consist of two components:~~

1. ~~On-the-job Student Performance: Job performance shall be assessed by Co-operative Education in consultation with the Department using information gathered during the internship and input from the employer. Evaluation of the on-the-job student performance will result in one of the following classifications: PASS WITH DISTINCTION, PASS, FAIL.~~
2. ~~Internship Report(s): Evaluation of the internship report will result in one of the following classifications: PASS WITH DISTINCTION, PASS, FAIL.~~

~~The evaluation of the on-the-job student performance and the internship report(s) are recorded separately on the transcript.~~

~~Overall evaluation of the internship will result in one of the following final grades being awarded:~~

1. ~~PASS WITH DISTINCTION: indicates outstanding performance in both the internship report(s) and the on-the-job student performance. PASS WITH DISTINCTION has been awarded to each of the internship report(s) and the on-the-job student performance.~~
2. ~~PASS: indicates that performance meets expectations in both the internship report(s) and on-the-job student performance. The student meets the requirements of a passing mark in the final internship report and on-the-job student performance.~~

3. ~~FAIL: indicates failing performance in either the internship report(s) or on-the-job student performance or both.~~

Also, the following will be noted in the transcript of the intern:

1. ~~Requirements for the Co-operative Internship in Computer Science have been completed. Internship Duration: — months.~~
2. ~~A grade of NC (No Credit) for Computer Science 3700 will be awarded in all semesters of the Co-operative Internship prior to the final Semester.~~

12.4.3 Third Year Courses

Course description 3700 Industrial Experience ~~is a course for students who are admitted to CICS open only to students who have been accepted into the Co-operative Internship in Computer Science. Students are required to register for this non-credit course every semester during their internship. This course is open only to students who have been accepted into the Internship Program and provides an opportunity for qualified students to obtain rewarding job experience of 8, 12 or 16 months of continuous duration in fields related to computer science during the course of their studies. Student are required to register for this course every semester during their 8, 12 or 16 month internship.~~ A grade of NC (No Credit) will be awarded for COMP 3700 if the student is continuing the co-operative internship into the next semester.

CH: 0

PR: admission to the Co-operative Internship in Computer Science (CICS)

CALENDAR ENTRY AFTER CHANGES

11.4.9 Co-operative Internship in Computer Science (CICS)

www.mun.ca/coop

The Co-operative Internship in Computer Science (CICS) provides an opportunity for qualified students to obtain rewarding co-operative internships 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. Admission to the CICS is limited and competitive.

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 or beyond;
4. must have at least 15 credit hours remaining after the co-operative internship in order to satisfy degree requirements, 3 credit hours of which must be in Computer Science; and
5. is expected to return to University as a full-time student after the co-operative internship.

In addition to the above, admission is also subject to academic performance.

11.4.9.2 Co-operative Internship Guidelines

1. General management of the CICS is the responsibility of Academic Staff Member(s) in Co-operative Education (ASM-CE). ASMs-CE are responsible for developing employment opportunities, organizing competitions for co-operative internship employment, co-operative education data management, monitoring students during co-operative internships, and evaluating co-operative internships.
2. Subject to the availability of appropriate co-operative internship employment, a student may complete a co-operative internship of 8, 12 or 16 consecutive months with a single employer. Co-operative internships are full-time, paid, and involve work that is relevant to the discipline of computer science.
3. The co-operative internship start and end dates are listed at www.mun.ca/coop/

4. Students are ultimately responsible for securing their co-operative internship. ASMs-CE provide support for the job search and inform students of potential opportunities.
5. Students who are admitted to the co-operative internship program give permission to ASMs-CE to supply prospective employers with copies of their resume and transcript.
6. A student who has been admitted to the CICS may independently obtain a co-operative internship in consultation with an ASM-CE. Such employment positions must satisfy the criteria for co-operative internships, be confirmed in writing by the employer and approved by an ASM-CE before the first day of the work term.
7. Students must register for the course Computer Science 3700 every semester during their co-operative internship. Computer Science 3700 is considered a full-time course load.
8. Students are not permitted to drop their co-operative internship without prior approval from an ASM-CE and the Head of the Department of Computer Science. Students who drop a co-operative internship without permission, who fail to honour an agreement to work with an employer, or who conduct themselves in such a manner as to cause their discharge from the co-operative internship, will normally be awarded a fail grade for the co-operative internship period and may not be permitted to reapply to the CICS.

Note:

Students should also refer to the **UNIVERSITY REGULATIONS - General Academic Regulations (Undergraduate)**.

12.4.3 Third Year Courses

Course description 3700 Industrial Experience is open only to students who have been accepted into the Co-operative Internship in Computer Science. This course provides an opportunity for qualified students to obtain rewarding job experience of 8, 12 or 16 months of continuous duration in fields related to computer science during the course of their studies. A grade of NC (No Credit) will be awarded for COMP 3700 if the student is continuing the co-operative internship into the next semester.

CH: 0

PR: admission to the Co-operative Internship in Computer Science (CICS)

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 | Have no concerns |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Suggestion for minor wording change |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | CS: include “or beyond” to make eligibility requirements more clear |
| <ul style="list-style-type: none"> • Biochemistry | |
| <ul style="list-style-type: none"> • Biology | |
| <ul style="list-style-type: none"> • Chemistry | |
| <ul style="list-style-type: none"> • Earth Sciences | |
| <ul style="list-style-type: none"> • Geography | |
| <ul style="list-style-type: none"> • Mathematics and Statistics | |
| <ul style="list-style-type: none"> • Ocean Sciences | |
| <ul style="list-style-type: none"> • Physics and Physical Oceanography | |

LIBRARY REPORT

Not yet received

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

ENGINEERING

On 2021-10-21 09:28, Cathy Hyde wrote:

> Hi,
>
> Thanks very much for your feedback. You bring up a good point about the
> wording in 1c and 1d. I believe the intention is to prevent students
> from
> counting both COMP 4766 and 4768 however, I'm not certain and will
> confirm.
>
> Regards,
>
> Cathy Hyde, MSc | Manager of Academic Programs, MSc
> Department of Computer Science
> Memorial University of Newfoundland
> www.mun.ca/computerscience/
>
> -----Original Message-----
> From: Engineering Consult <engrconsult@mun.ca>
> Sent: Wednesday, October 20, 2021 2:02 PM
> To: Cathy Hyde <cs-ugradadv@mun.ca>
> Subject: Re: Consultation on Calendar changes - Computer Science
>
> Dear Ms. Hyde,
> Thank you for the opportunity to consult on the below proposed Computer
> Science Calendar Changes.
> Engineering notes no impact on our program.
> Regarding the UCCP forms attached to your email, Engineering notes the
> following for your consideration:
>
> Major in Computer Science (Visual Computing and Games), page 46:
> 1c and 1d seem appear to be almost redundant. If the intent is to
> prevent students from counting both COMP 4766 and 4768 towards their
> major, then the wording is OK. Otherwise, the two clauses could be
> combined into "Nine additional credit hours in Computer Science courses
> selected from Computer Science 2300, 3200, 4301, 4302, 4303, 4304,
> 4766,
> 4768."
>
> Trivial comments on page 60 (CICS admission, 11.4.9.1, #4): replace
> "CH" by
> "credit hours".

> and page 61, 11.4.9.2 #1, #4 & #5: replace "ASM-CEs" by "ASMs-CE"

>

> Best regards,

> Bruce

>

> ---

> Dr. Bruce Quinton, Chair

> Committee on Undergraduate Studies

> Faculty of Engineering and Applied Science Memorial University of

> Newfoundland

> St. John's NL A1B 3X5

> -----

>

> On 2021-10-14 16:29, Cathy Hyde wrote:

>> Hi,

>>

>> I am writing to extend an opportunity for you to provide formal
>> feedback on the attached Calendar change proposals. I have attached 7
>> proposals relating to:

>>

>> 1. Adding a new Data Science stream major program

>> (undergraduate)

>>

>> 2. A new course related to Data Pre-processing Techniques

>>

>> 3. Changing the 3000- and 4000-level CS course requirements in

>> the Smart Systems stream to be consistent with the general major

>> requirements

>>

>> 4. Changing the 3000- and 4000-level CS course requirements in

>> the Visual Computing and Games stream to be consistent with the

>> general major requirements

>>

>> 5. Changing the stats course requirement in our joint Computer

>> Science-Economics and Computer Science-Geography joint major programs

>> to be consistent with our other major programs

>>

>> 6. Changing admission requirements for the Computer Science

>> minor program to be competitive

>>

>> 7. Changing the CICS program wording

>>

>> If you have any comments on these proposed Calendar changes please

>> send them to me: cs-ugradadv@mun.ca.

>>

>> Thank you,

>>

>> CATHY HYDE, MSC | MANAGER OF ACADEMIC PROGRAMS, MSC

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s):
- New program(s): Major in Computer Science (Data Science) (B.Sc. only)
- 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

Major in Computer Science (Data Science) (B.Sc. only)

RATIONALE

Data are essential in today's industries, science and government, and data scientists are in high demand. Data play a vital role in decision making in many areas such as social sciences, business, biomedical science, and government policy. Our Data Science stream will prepare students to deal with data at every step of the data processing cycle to transform data into useful information

CALENDAR CHANGES

Faculty of Science

11.4 Computer Science

www.mun.ca/computerscience

The following undergraduate programs are available in the Department:

1. Applied Mathematics and Computer Science Joint Major
2. Computer Science Honours (B.A., B.Sc.)
3. Computer Science and Economics Joint Major
4. Computer Science and Geography Joint Honours
5. Computer Science and Geography Joint Major
6. Computer Science and Physics Joint Honours (B.Sc. only)
7. Computer Science and Physics Joint Major (B.Sc. only)
8. Computer Science and Pure Mathematics Joint Honours
9. Computer Science and Pure Mathematics Joint Major
10. Computer Science and Statistics Joint Honours
11. Computer Science and Statistics Joint Major
12. Computer Science (Software Engineering) Honours (B.Sc. only)
13. Co-operative Internship in Computer Science (CICS)
14. Major in Computer Science
15. Major in Computer Science (Smart Systems) (B.Sc. only)
16. Major in Computer Science (Visual Computing and Games) (B.Sc. only)
17. Major in Computer Science (Data Science) (B.Sc. only)
18. Minor in Computer Science

Details of joint program offerings may be found in the Faculty of Science section under Joint Program Regulations.

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

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:

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.

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.

11.4.2 Admission to Honours Programs

The Honours programs in the Department of Computer Science are designed for students who would like to concentrate their studies or pursue graduate work. Students who wish to be admitted to these programs must submit an "Application for Admission to Honours Program Faculties of Humanities and Social Sciences or Science" to the Department of Computer Science by June 1 for Fall semester registration. To be eligible for admission, students must have successfully completed all Computer Science core requirements (Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008) and obtained in these courses a grade of "B" or better, or an average of 75% or higher. Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance in the required courses. In special circumstances, students may be admitted to Honours Programs at times other than June.

Students are advised to consult the Bachelor of Arts (Honours) Degree Regulations Degree Regulations for the Honours Degree of Bachelor of Science (as appropriate).

11.4.3 Major in Computer Science

As a component of the Degree Regulations for the General Degree of Bachelor of Science or the Degree Regulations for the General Degree of Bachelor of Arts, as appropriate, a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science:
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008.
 - b. At least 6 additional credit hours in Computer Science at the 4000 level.
 - c. Twelve additional credit hours in Computer Science at the 3000 level or beyond.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

Note:

Students are encouraged to take Mathematics 3000 and Statistics 2560.

11.4.4 Major in Computer Science (Smart Systems) (B.Sc. only)

As a component of the Degree Regulations for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Smart Systems):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3200, 3201, 3202 and 3301; and
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 3401, 3550, 4301, 4303, 4750, 4766.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550

11.4.5 Major in Computer Science (Visual Computing and Games) (B.Sc. only)

As a component of the Degree Regulations for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Visual Computing and Games):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3300, 3301, and 4300;
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 2300, 3200, 4301, 4302, 4303, 4304; and
 - d. Three additional credit hours in Computer Science courses selected from those listed in c. above, or Computer Science 2100, 4766, 4768.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

11.4.6 Major in Computer Science (Data Science) (B.Sc. only)

As a component of the Degree Regulations for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Data Science):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3400, 3202, 3401 and 4304; and
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 4550, 4734, 4750, 4754, 4820.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

It is recommended, but not required, that students take Business 4720.

Faculty of Humanities and Social Sciences

15.4 Computer Science

www.mun.ca/computerscience

For Departmental Regulations and Course Descriptions, see Faculty of Science section of the Calendar.

The following undergraduate programs are available in the Department of Computer Science:

1. Applied Mathematics and Computer Science Joint Major
2. Computer Internship Option (CIIO)
3. Computer Science Honours (B.A., B.Sc.)
4. Computer Science and Economics Joint Major
5. Computer Science and Geography Joint Honours
6. Computer Science and Geography Joint Major
7. Computer Science and Physics Joint Honours (B.Sc. only)
8. Computer Science and Physics Joint Major (B.Sc. only)
9. Computer Science and Pure Mathematics Joint Honours
10. Computer Science and Pure Mathematics Joint Major
11. Computer Science and Statistics Joint Honours
12. Computer Science and Statistics Joint Major
13. Computer Science (Software Engineering) Honours (B.Sc. only)
14. Major in Computer Science
15. Major in Computer Science (Smart Systems) (B.Sc. only)
16. Major in Computer Science (Visual Computing and Games) (B.Sc. only)
17. Major in Computer Science (Data Science) (B.Sc. only)
18. Minor in Computer Science

CALENDAR ENTRY AFTER CHANGES

Faculty of Science

11.4 Computer Science

www.mun.ca/computerscience

The following undergraduate programs are available in the Department:

1. Applied Mathematics and Computer Science Joint Major
2. Computer Science Honours (B.A., B.Sc.)
3. Computer Science and Economics Joint Major
4. Computer Science and Geography Joint Honours
5. Computer Science and Geography Joint Major
6. Computer Science and Physics Joint Honours (B.Sc. only)
7. Computer Science and Physics Joint Major (B.Sc. only)
8. Computer Science and Pure Mathematics Joint Honours
9. Computer Science and Pure Mathematics Joint Major
10. Computer Science and Statistics Joint Honours
11. Computer Science and Statistics Joint Major
12. Computer Science (Software Engineering) Honours (B.Sc. only)
13. Co-operative Internship in Computer Science (CICS)
14. Major in Computer Science
15. Major in Computer Science (Smart Systems) (B.Sc. only)
16. Major in Computer Science (Visual Computing and Games) (B.Sc. only)
17. Major in Computer Science (Data Science) (B.Sc. only)
18. Minor in Computer Science

Details of joint program offerings may be found in the Faculty of Science section under Joint Program Regulations.

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

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:

5. Computer Science 1001, 1002.
6. Six credit hours in Critical Reading and Writing (CRW) courses, including at least 3 credit hours in English courses.
7. Mathematics 1000 and 1001 (or 1090 and 1000).

8. 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.

11.4.2 Admission to Honours Programs

The Honours programs in the Department of Computer Science are designed for students who would like to concentrate their studies or pursue graduate work. Students who wish to be admitted to these programs must submit an "Application for Admission to Honours Program Faculties of Humanities and Social Sciences or Science" to the Department of Computer Science by June 1 for Fall semester registration. To be eligible for admission, students must have successfully completed all Computer Science core requirements (Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008) and obtained in these courses a grade of "B" or better, or an average of 75% or higher. Students who fulfill the eligibility requirements compete for a limited number of available spaces. Selection is based on academic performance in the required courses. In special circumstances, students may be admitted to Honours Programs at times other than June.

Students are advised to consult the Bachelor of Arts (Honours) Degree Regulations Degree Regulations for the Honours Degree of Bachelor of Science (as appropriate).

11.4.3 Major in Computer Science

As a component of the Degree Regulations for the General Degree of Bachelor of Science or the Degree Regulations for the General Degree of Bachelor of Arts, as appropriate, a student must successfully complete the following courses:

3. Forty-five credit hours in Computer Science courses are required for a major in Computer Science:
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008.
 - b. At least 6 additional credit hours in Computer Science at the 4000 level.
 - c. Twelve additional credit hours in Computer Science at the 3000 level or beyond.
4. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

Note:

Students are encouraged to take Mathematics 3000 and Statistics 2560.

11.4.4 Major in Computer Science (Smart Systems) (B.Sc. only)

As a component of the Degree Regulations for the General Degree of Bachelor of Science a student must successfully complete the following courses:

3. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Smart Systems):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3200, 3201, 3202 and 3301; and
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 3401, 3550, 4301, 4303, 4750, 4766.
4. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

11.4.5 Major in Computer Science (Visual Computing and Games) (B.Sc. only)

As a component of the Degree Regulations for the General Degree of Bachelor of Science a student must successfully complete the following courses:

3. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Visual Computing and Games):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3300, 3301, and 4300;
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 2300, 3200, 4301, 4302, 4303, 4304; and
 - d. Three additional credit hours in Computer Science courses selected from those listed in c. above, or Computer Science 2100, 4766, 4768.
4. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

11.4.6 Major in Computer Science (Data Science) (B.Sc. only)

As a component of the Degree Regulations for the General Degree of Bachelor of Science a student must successfully complete the following courses:

3. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Data Science):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3400, 3202, 3401 and 4304; and
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 4550, 4734, 4750, 4754, 4820.
4. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

It is recommended, but not required, that students take Business 4720.

Faculty of Humanities and Social Sciences

15.4 Computer Science

www.mun.ca/computerscience

For Departmental Regulations and Course Descriptions, see Faculty of Science section of the Calendar.

The following undergraduate programs are available in the Department of Computer Science:

1. Applied Mathematics and Computer Science Joint Major
2. Computer Internship Option (CIIO)
3. Computer Science Honours (B.A., B.Sc.)
4. Computer Science and Economics Joint Major
5. Computer Science and Geography Joint Honours
6. Computer Science and Geography Joint Major
7. Computer Science and Physics Joint Honours (B.Sc. only)

8. Computer Science and Physics Joint Major (B.Sc. only)
9. Computer Science and Pure Mathematics Joint Honours
10. Computer Science and Pure Mathematics Joint Major
11. Computer Science and Statistics Joint Honours
12. Computer Science and Statistics Joint Major
13. Computer Science (Software Engineering) Honours (B.Sc. only)
14. Major in Computer Science
15. Major in Computer Science (Smart Systems) (B.Sc. only)
16. Major in Computer Science (Visual Computing and Games) (B.Sc. only)
17. Major in Computer Science (Data Science) (B.Sc. only)
18. Minor in Computer Science

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 | Have no concerns |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Have no concerns |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | |
| <ul style="list-style-type: none"> • Biochemistry | |
| <ul style="list-style-type: none"> • Biology | |
| <ul style="list-style-type: none"> • Chemistry | |
| <ul style="list-style-type: none"> • Earth Sciences | |

| | |
|-------------------------------------|--|
| • Geography | |
| • Mathematics and Statistics | |
| • Ocean Sciences | |
| • Physics and Physical Oceanography | |

LIBRARY REPORT

Not yet received

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:

- 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 Programs

PROGRAM TITLE

Minor in Computer Science

RATIONALE

This is a proposal to change the requirements for admission to the Computer Science minor program to be competitive and selective, similar to the Computer Science major. We wish to require a certain set of courses be completed in order to be considered eligible for the program; once eligible, minor applicants will be ranked based on grades. The Computer Science program has grown in recent years and this change is required in order to guarantee course availability to students who have been admitted into the major and minor programs.

Computer Science would like this change to take effect immediately so that the new admission requirements can be used for Fall 2022 to minor admission.

CALENDAR CHANGES

11.4.3 Admission to Minor Program

Admission to the Minor program in the Department of Computer Science is competitive and selective. Students who wish to enter this program must submit a completed application form to the Department of Computer Science by June 1 for Fall semester registration. The online application form is located on the Department of Computer Science's website.

To be eligible for admission students must have normally completed 9 credit hours as listed below:

1. Computer Science 1001, 1002.
2. Mathematics 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

11.4.3 Admission to Minor Program

Admission to the Minor program in the Department of Computer Science is competitive and selective. Students who wish to enter this program must submit a completed application form to the Department of Computer Science by June 1 for Fall semester registration. The online application form is located on the Department of Computer Science's website.

To be eligible for admission students must have normally completed 9 credit hours as listed below:

1. Computer Science 1001, 1002.
2. Mathematics 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.

Secondary CALENDAR CHANGES

4.2.3 Admission to a Minor Program in the Faculty of Science

Declaration of a Minor program in the Faculty of Science may be made by means of the appropriate program declaration form, which is available at www.mun.ca/regoff/forms.php. The department which administers the intended Minor subject is known as the Minor department. Admission to certain Minor programs is limited and competitive.

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 | Have no concerns |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Have no concerns |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |

| | |
|-------------------------------------|------------------|
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | |
| • Biochemistry | |
| • Biology | |
| • Chemistry | |
| • Earth Sciences | |
| • Geography | |
| • Mathematics and Statistics | |
| • Ocean Sciences | |
| • Physics and Physical Oceanography | |

LIBRARY REPORT

Not yet received

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:

- New course(s):
- Amended or deleted course(s):
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- Amended or deleted program(s):
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- 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-3400 Data Preparation Techniques

ABBREVIATED COURSE TITLE

COMP-3400 Data Prep Tech

RATIONALE

Students will learn several data preparation techniques for pre-processing a data set for data analytics tasks such as data mining, machine learning and data visualization. The course includes data cleaning, scaling, normalizing, discretizing, imputing data, feature engineering and selection, and dimensionality reduction. The course will also include how to scale up the processing with distributed frameworks such as Apache Spark to handle large datasets. Finally, the students will see a high-level overview of some traditional data mining algorithms, such as linear regression and classification, decision trees, k-means and DBSCAN that will be eventually introduced to evaluate the impact of the techniques being taught.

CALENDAR CHANGES

COMP 3400- Data Preparation Techniques will give students basic knowledge on how to pre-process raw data. The aim is to enable students to perform data pre-processing in small and large data sets, evaluate the effect of pre-processing techniques using data mining/machine learning methods, and to scale up the pre-processing of large datasets using distributed frameworks.

LH: 3

PR: Statistics 2500 or Statistics 2550, COMP 2001.

CALENDAR ENTRY AFTER CHANGES

COMP 3400- Data Preparation Techniques will give students basic knowledge on how to pre-process raw data. The aim is to enable students to perform data pre-processing in small and large data sets, evaluate the effect of pre-processing techniques using data mining/machine learning methods, and to scale up the pre-processing of large datasets using distributed frameworks.

LH: 3

PR: Statistics 2500 or Statistics 2550, COMP 2001.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

| | |
|-----------------------------------------------|------------------------------------------------------------------------------------|
| Academic Advising Centre | |
| Humanities and Social Sciences | Have no concerns |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Have no concerns |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | CS update title from Data Pre-processing Techniques to Data Preparation Techniques |
| • Biochemistry | • |
| • Biology | • |
| • Chemistry | • |
| • Earth Sciences | • |
| • Geography | • |
| • Mathematics and Statistics | • |
| • Ocean Sciences | • |
| • Physics and Physical | • |

| | |
|--------------|--|
| Oceanography | |
|--------------|--|

LIBRARY REPORT

Not received

RESOURCE IMPLICATIONS

The current departmental computing facilities, software, instructional staff, and technical support staff will be utilized. The course draws on knowledge and expertise from a new Computer Science faculty member that works with Data Science. Additional lab materials and equipment are within the current resource framework of the Department of Computer Science.

Instructional Costs

Teaching commitment is one regular (three credit hours) lecture offering.

Library Holdings and/or Other Resources Required

No additional requirements.

The costs associated with new program/course(s) can be met from within the existing budget allocation for the Faculty of Science

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS**Course Outline and Method of Evaluation**

- iPython, Jupyter notebooks, and NumPy basics.
- Pandas (mapping, sorting and ranking, and descriptive statistics), Matplotlib
- Data cleaning
 - Reasons to clean data.
 - Identify values for cleaning, formatting, finding outliers and duplicates.
- Data scaling, normalization, and discretization
 - Min-max scaler, standard scaler, max abs scaler, robust scaler, quantile transformer scaler, power transformer scaler, unit vector scaler.

- Range, clipping, log and z-score normalization.
- Equal width discretization and equal-frequency discretization.
- Binning histogram and correlation analysis for data discretization.
- Scikit-learn basics, Supervised Learning (Bayesian, k-Nearest neighbors, Decision trees, Linear models)
 - Basics of the scikit-learn package, how to prepare your data, load and execute models.
 - Using basic models such as Bayesian, kNearest neighbors, Decision trees, Linear models.
 - How cleaning, scaling, normalization and discretization affects supervised learning
- Scikit-learn, Unsupervised Learning (Kmeans and DB-SCAN)
 - How cleaning, scaling, normalization and discretization affects unsupervised learning.
- Scikit-learn, Dimensionality reduction (PCA and TSNe)
 - How cleaning, scaling, normalization and discretization affects dimensionality reduction.
- Scikit-learn, Feature selection
 - Statistics for filter feature selection method, correlation statistics, selection method, and transform variables.
- Data integration and encodings
 - A data integration primer. How to combine data sets with join, merge and concatenation.
 - One-hot encoding.
- Map Reduce
 - Scaling up the data analysis with the Map Reduce framework. Apache spark basics and examples

The final grade in this course will be determined by three project iterations as follows:

| | |
|------------------------|-----|
| Quizzes (6) | 30% |
| Assignments (3) | 40% |
| Final Exam | 30% |

Assignments and Quizzes are individual. Students must pass the final exam to pass the course.

Texts

The instructor will provide papers and lecture notes to be read by the students.

Library Holdings and/or Other Resources

None.

Instructor

Dr. Amilcar Soares, Assistant Professor, Department of Computer Science.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

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

ADMINISTRATIVE AUTHORIZATION

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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 Programs

PROGRAM TITLE

Major in Computer Science (Smart Systems) (B.Sc. only)

RATIONALE

This is a proposal to change the requirements for the majors stream in Smart Systems to bring it into line with the requirements for the general majors. Computer Science general majors students are required to take at least 12 credit hours at the 3000 level or above, and 6 credit hours at the 4000 level or above. However, the current regulations allow a student to graduate from the Smart Systems stream having taken no courses at the 4000 level. We are proposing changing the required courses such that Smart Systems majors will be required to take at least 12 credit hours at the 3000 level or above and 6 credit hours at the 4000 level or above.

CALENDAR CHANGES

11.4.4 Major in Computer Science (Smart Systems) (B.Sc. only)

As a component of the [Degree Regulations](#) for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Smart Systems):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3200, 3201, 3202 and ~~3301~~ one of 3301, 3401 or 3550; and
 - c. Six additional credit hours in Computer Science courses selected from Computer Science ~~3401, 3550~~, 4301, 4303, 4750, 4766.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

CALENDAR ENTRY AFTER CHANGES

11.4.4 Major in Computer Science (Smart Systems) (B.Sc. only)

As a component of the **Degree Regulations** for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Smart Systems):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3200, 3201, 3202 and one of 3301, 3401 or 3550; and
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 4301, 4303, 4750, 4766.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 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 | Have no concerns |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Have no concerns |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | |
| <ul style="list-style-type: none"> • Biochemistry | |
| <ul style="list-style-type: none"> • Biology | |
| <ul style="list-style-type: none"> • Chemistry | |

| | |
|-------------------------------------|--|
| • Earth Sciences | |
| • Geography | |
| • Mathematics and Statistics | |
| • Ocean Sciences | |
| • Physics and Physical Oceanography | |

LIBRARY REPORT

Not yet received

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:

- 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
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- 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.

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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 Economics Joint Major

Computer Science and Geography Joint Major

RATIONALE

Last year we submitted Calendar changes to update the Compute Science course and program Statistics pre-requisites to be “Statistics 2500 or Statistics 2550”, however, the Computer Science-Economics joint major and the Computer Science-Geography joint major programs were missed. This change is to update the statistics requirements for these two programs to match the rest of the Computer Science programs

CALENDAR CHANGES

10.1.4 Computer Science and Economics 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 Requirements

Forty-two credit hours in Computer Science courses are required for a joint major in Computer Science and Economics:

- a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2500, 3731, 3753;
- b. ~~plus 6 further~~ Six additional credit hours in Computer Science courses numbered 3000 or higher.

2. Economics requirements

~~A total of 42~~ Forty-two credit hours in Economics courses are required for a joint major in Computer Science and Economics:

- a. Economics 1010 (or the former 2010), 1020 (or the former 2020), 2550, 3000, 3001, 3010;
- b. ~~and 6~~ Six credit hours from either 3550 and 3551, or 4550 and 4551; ~~are obligatory.~~
- c. The remaining 18 credit hours shall be chosen from among the various Economics courses in consultation with the Head of the Department or delegate, and will include at least 9 credit hours in courses at the 4000 level.

3. **Additional Requirements:** Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

10.1.5 Computer Science and Geography 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 Requirements**
Thirty-nine credit hours in Computer Science courses are required: 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2500, the former 4751 plus 6 further credit hours in Computer Science courses numbered 3000 or higher.
2. **Geography Requirements**
Thirty-nine credit hours in Geography courses are required: 1050, 2001, 2102, 2195, 2302, 2425, 3202, 3222, 3250, 3260, 4202, 4250, 4261.
3. **Additional Requirements:** Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

CALENDAR ENTRY AFTER CHANGES

10.1.4 Computer Science and Economics 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 Requirements**
Forty-two credit hours in Computer Science courses are required for a joint major in Computer Science and Economics:
 - a. Computer Science
1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2500, 3731, 3753;
 - b. Six additional credit hours in Computer Science courses numbered 3000 or higher.
2. **Economics requirements**
Forty-two credit hours in Economics courses are required for a joint major in Computer Science and Economics:
 - a. Economics 1010 (or the former 2010), 1020 (or the former 2020), 2550, 3000, 3001, 3010;
 - b. Six credit hours from either 3550 and 3551, or 4550 and 4551;
 - c. The remaining 18 credit hours shall be chosen from among the various Economics courses in consultation with the Head of the Department or delegate, and will include at least 9 credit hours in courses at the 4000 level.
3. **Additional Requirements:** Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

10.1.5 Computer Science and Geography Joint Major

As a component of the **Degree Regulations** for the General Degree of Bachelor of Science, the following courses are required:

4. **Computer Science Requirements**

Thirty-nine credit hours in Computer Science courses are required: 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2500, the former 4751 plus 6 further credit hours in Computer Science courses numbered 3000 or higher.

5. **Geography Requirements**

Thirty-nine credit hours in Geography courses are required: 1050, 2001, 2102, 2195, 2302, 2425, 3202, 3222, 3250, 3260, 4202, 4250, 4261.

6. **Additional Requirements:** Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 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 | Suggestions for wording clarification Request to mirror proposed wording changes in HSS section of Calendar |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Have no concerns |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | |
| <ul style="list-style-type: none"> • Biochemistry | |
| <ul style="list-style-type: none"> • Biology | |
| <ul style="list-style-type: none"> • Chemistry | |
| <ul style="list-style-type: none"> • Earth Sciences | |
| <ul style="list-style-type: none"> • Geography | |
| <ul style="list-style-type: none"> • Mathematics and Statistics | |
| <ul style="list-style-type: none"> • Ocean Sciences | |
| <ul style="list-style-type: none"> • Physics and Physical Oceanography | |

LIBRARY REPORT

Not yet received

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

HSS

From: Cathy Hyde <cs-ugradadv@mun.ca>
Sent: Tuesday, October 19, 2021 9:07 AM
To: 'Hoff, Shannon' <shoff@mun.ca>
Subject: RE: Feedback on CS Calendar Change Proposals

Hi Shannon,

Thanks very much for your feedback, I agree that what you have outlined below provides clarity.

Cathy Hyde, MSc | Manager of Academic Programs, MSc

Department of Computer Science

Memorial University of Newfoundland

www.mun.ca/computerscience/

From: Hoff, Shannon <shoff@mun.ca>
Sent: Sunday, October 17, 2021 5:48 PM
To: cs-ugradadv@mun.ca
Cc: Burke, Charlene <charlenes@mun.ca>
Subject: Feedback on CS Calendar Change Proposals

Hello,

Basically all of these calendar change proposals look straightforward and good. I had one comment about the proposal for the joint Computer Science/Economics proposal. The format of the listing of requirements is different from the others and is a bit confusing. It seems advisable to change the formatting and clear up the confusing language.

The language that's somewhat confusing is under the "Economics requirements": "Six credit hours from either 3550 and 3551, or 4550 and 4551." Does this mean that a student does either the first set or the second set, or that a student chooses one course from each set? I imagine that the first is meant, but I don't know if this is right, and if it is right, I wonder if it could be made clearer.

Further, this is the current formatting of the proposal:

1. Computer Science Requirements

Forty-two credit hours in Computer Science courses are required: 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2500, 3731, 3753 plus 6 further credit hours in Computer Science courses numbered 3000 or higher.

2. Economics requirements

A total of 42 credit hours in Economics courses are required: 1010 (or the former 2010), 1020 (or the former 2020), 2550, 3000, 3001, 3010, and 6 credit hours from either 3550 and 3551, or 4550 and 4551 are obligatory. The remaining 18 credit hours shall be chosen from among the various Economics courses in consultation with the Head of the Department or delegate, and will include at least 9 credit hours in courses at the 4000 level.

3. Additional Requirements: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

And this is what it could look like if it looked more like the others (but it's just an example so you can see what I mean):

1. Computer Science Requirements

Forty-two credit hours in Computer Science courses are required for a joint major in Computer Science and Economics:

- a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2500, 3731, and 3753;
- b. Six additional credit hours in Computer Science courses at the 3000 level or higher

2. Economics requirements

Forty-two credit hours in Economics courses are required for a joint major in Computer Science and Economics:

- a. Economics 1010 (or the former 2010), 1020 (or the former 2020), 2550, 3000, 3001, and 3010;
- b. Six credit hours from either 3550 and 3551, or 4550 and 4551;
- c. The remaining 18 credit hours shall be chosen from among the various Economics courses in consultation with the Head of the Department or delegate, and will include at least 9 credit hours in courses at the 4000 level.

3. Additional Requirements: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

Please feel free to do what you will with these comments!

All the best,

Shannon

Shannon Hoff

Associate Professor of Philosophy

Acting Associate Dean (Curriculum and Programs)

Faculty of Humanities and Social Sciences

Memorial University
St. John's, NL A1C 5S7

From: Shute,Renee S. <rshute@mun.ca>
Sent: Tuesday, October 19, 2021 4:15 PM
To: Cathy Hyde <cs-ugradadv@mun.ca>
Subject: RE: Consultation on Calendar changes - Computer Science

Thanks Cathy

I actually meant to ask if you would check the info in the HSS section to make sure it mirrored any changes that were being made with the new proposal.

Sorry, I did not do a good job of explaining myself. Too much on the go and trying to deal with everything at once.

Renee

From: Cathy Hyde <cs-ugradadv@mun.ca>
Sent: October-19-21 4:12 PM
To: Shute,Renee S. <rshute@mun.ca>
Subject: RE: Consultation on Calendar changes - Computer Science

Hi Renée,

Thanks very much for this, you're absolutely right that we need to update the HSS section of the Calendar. We have so few BA students doing Computer Science that it is not top of mind for me like it was in Psychology.

Regards,

Cathy Hyde, MSc | Manager of Academic Programs, MSc

Department of Computer Science
Memorial University of Newfoundland
www.mun.ca/computerscience/

From: Shute, Renee S. <rshute@mun.ca>
Sent: Tuesday, October 19, 2021 12:54 PM
To: cs-ugradadv@mun.ca
Subject: RE: Consultation on Calendar changes - Computer Science

Hi Cathy,

Regarding the proposed joint majors on COMP/ECON and COMP/GEOG.

Will the information for these programs be added to the HSS section of the Calendar? If these programs are also available to BA students then the information should also be included in the ECON and GEOG sections of the Calendar.

Thanks for considering this request.

Renee

Renée Shute
Manager of Academic Programs, Faculty of Humanities and Social Sciences
Memorial University of Newfoundland
St. John's, NL, Canada A1C 5S7
Office: AA4077
Tel (709) 864-7454

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

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

ADMINISTRATIVE AUTHORIZATION

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

Signature of Dean/Vice-President: _____

Date: _____

Date of approval by Faculty/Academic Council: _____

Memorial University of Newfoundland

Undergraduate Calendar Change Proposal Form

Senate Summary Page for Programs

PROGRAM TITLE

Major in Computer Science (Visual Computing and Games) (B.Sc. only)

RATIONALE

This is a proposal to change the requirements for the majors stream in Visual Computing and Games to bring it into line with the requirements for the general majors. Computer Science general majors students are required to take at least 12 credit hours at the 3000 level or above, and 6 credit hours at the 4000 level. However, the current regulations allow students to graduate from the Visual Computing and Games stream with only 3 credit hours at the 4000 level and only 9 credit hours at the 3000 level.

We are proposing to remove COMP2100 (Social Web Analysis) and COMP2300 (Introduction to Multimedia Programming) from the list of courses that can be taken to satisfy the majors stream in Visual Computing and Games. Neither course has ever been offered. We are not looking to remove either course from the calendar entirely, so they could still be offered in future. They just wouldn't contribute towards the requirement for the Visual Computing and Games stream.

CALENDAR CHANGES

11.4.5 Major in Computer Science (Visual Computing and Games) (B.Sc. only)

As a component of the [Degree Regulations](#) for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Visual Computing and Games):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3300, 3301, and 4300;
 - c. Six additional credit hours in Computer Science courses selected from Computer Science ~~2300~~, 3200, 4301, 4302, 4303, 4304; and
 - d. Three additional credit hours in Computer Science courses selected from those listed in c. above, or Computer Science ~~2100~~, 4766, 4768.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 2550.

CALENDAR ENTRY AFTER CHANGES

11.4.5 Major in Computer Science (Visual Computing and Games) (B.Sc. only)

As a component of the **Degree Regulations** for the General Degree of Bachelor of Science a student must successfully complete the following courses:

1. Forty-five credit hours in Computer Science courses are required for a major in Computer Science (Visual Computing and Games):
 - a. Computer Science 1001, 1002, 1003, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008;
 - b. Computer Science 3300, 3301, and 4300;
 - c. Six additional credit hours in Computer Science courses selected from Computer Science 3200, 4301, 4302, 4303, 4304; and
 - d. Three additional credit hours in Computer Science courses selected from those listed in c. above, or Computer Science 4766, 4768.
2. Additional courses required are: Mathematics 1000, 1001, 2000, 2050, and Statistics 2500 or 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 | Have no concerns |
| Business Administration | |
| Education | |
| Engineering and Applied Science | Suggestion for formatting change |
| Grenfell Campus (Arts & Social Sciences) | |
| Grenfell Campus (Science and the Environment) | |
| Grenfell Campus (Fine Arts) | |
| Human Kinetics and Recreation | |
| Library | |
| Marine Institute | |
| Medicine | Have no concerns |
| Music | |

| | |
|-------------------------------------|------------------|
| Nursing | |
| Pharmacy | Have no concerns |
| Social Work | |
| Science | |
| • Biochemistry | |
| • Biology | |
| • Chemistry | |
| • Earth Sciences | |
| • Geography | |
| • Mathematics and Statistics | |
| • Ocean Sciences | |
| • Physics and Physical Oceanography | |

LIBRARY REPORT

Not yet received

RESOURCE IMPLICATIONS

There are no resource implications associated with this change.

ADDITIONAL INFORMATION REQUIRED FOR NEW COURSE PROPOSALS

ENGINEERING

On 2021-10-21 09:28, Cathy Hyde wrote:

> Hi,

>

> Thanks very much for your feedback. You bring up a good point about the

> wording in 1c and 1d. I believe the intention is to prevent students

> from

> counting both COMP 4766 and 4768 however, I'm not certain and will

> confirm.

>

> Regards,

>

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

> Department of Computer Science

> Memorial University of Newfoundland

> www.mun.ca/computerscience/

>

> -----Original Message-----

> From: Engineering Consult <engrconsult@mun.ca>

> Sent: Wednesday, October 20, 2021 2:02 PM

> To: Cathy Hyde <cs-ugradadv@mun.ca>
> Subject: Re: Consultation on Calendar changes - Computer Science
>
> Dear Ms. Hyde,
> Thank you for the opportunity to consult on the below proposed Computer
> Science Calendar Changes.
> Engineering notes no impact on our program.
> Regarding the UCCP forms attached to your email, Engineering notes the
> following for your consideration:
>
> Major in Computer Science (Visual Computing and Games), page 46:
> 1c and 1d seem appear to be almost redundant. If the intent is to
> prevent students from counting both COMP 4766 and 4768 towards their
> major, then the wording is OK. Otherwise, the two clauses could be
> combined into "Nine additional credit hours in Computer Science courses
> selected from Computer Science 2300, 3200, 4301, 4302, 4303, 4304,
> 4766,
> 4768."
>
> Trivial comments on page 60 (CICS admission, 11.4.9.1, #4): replace
> "CH" by
> "credit hours".
> and page 61, 11.4.9.2 #1, #4 & #5: replace "ASM-CEs" by "ASMs-CE"
>
> Best regards,
> Bruce
>
> ---
> Dr. Bruce Quinton, Chair
> Committee on Undergraduate Studies
> Faculty of Engineering and Applied Science Memorial University of
> Newfoundland
> St. John's NL A1B 3X5

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s):
- Amended or deleted course(s): *Cross-list existing BIOL 4910 with Ocean Sciences (OCSC 4923) and amend course title and update course description*
- 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 4910: Vertebrate Diversity and Adaptation

REVISED COURSE NUMBER AND TITLE

BIOL 4910/OCSC 4923: Vertebrate Diversity and Adaptation on Land and in Water

REVISED ABBREVIATED TITLE

Vert Divers Adapt Land Water

RATIONALE

This proposal seeks to diversify the offering of Ocean Sciences courses that offer hands-on and experiential opportunities by cross-listing a course that is co-taught with Biology, and adjust its title and outline to fit the Ocean Sciences and joint Marine Biology programs. Once COVID restrictions on international travel lift, we hope to resume courses at Harlow, cross-listing with Ocean Sciences will increase enrollment, thereby making it more feasible and cost-effective to run Harlow courses.

CALENDAR CHANGES

There is no course description listed in the calendar, as BIOL 4910 is a Special Topics course. The wording below is proposed in materials for promotion of the course to students once COVID restrictions on travel are lifted and it becomes feasible to offer Harlow courses again.

BIOL 4910/OCSC 4923: Vertebrate Diversity and Adaptation on Land and in Water

This course explores the diversity of vertebrate life in the sea and on land through a variety of field trips and hands-on experiences at our Harlow Campus. Students will learn about vertebrate morphology, adaptations, ecology and conservation as well as be exposed to research and application to museum science, conservation, animal husbandry and fisheries and wildlife management.

PR: BIOL 2210.

Takes place as a 2-week intensive in May, based at the Harlow campus in the UK.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

CONSULTATIONS SOUGHT

| From | Response Received |
|-------------------------------------------------|--------------------------|
| Grenfell campus | |
| Faculty of Business Administration | |
| Faculty of Education | |
| Faculty of Engineering & Applied Science | |
| Faculty of Humanities & Social Sciences | |
| Faculty of Science | |
| Department of Biochemistry | |
| Department of Chemistry | |
| Department of Computer Sciences | |
| Department of Earth Sciences | |
| Department of Economics | |
| Department of Geography | |
| Department of Mathematics and Statistics | |
| Department of Ocean Sciences | Yes - support |
| Department of Physics and Physical Oceanography | |
| Department of Psychology | |
| Marine Institute | |
| School of Human Kinetics and Recreation | |
| School of Medicine | |
| School of Nursing | |
| School of Pharmacy | |
| School of Social Work | |

LIBRARY REPORT

Not applicable.

RESOURCE IMPLICATIONS

There are no additional resource implications from the proposed cross-listing.

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Cover Page

LIST OF CHANGES

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

- New course(s): Special Topics: Practical Approaches in Molecular Marine Sciences
- 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

Ocean Sciences 4945 Special Topics: Practical Approaches in Molecular Marine Sciences

ABBREVIATED TITLE

Sp Top Practical Mol Mar Sci

RATIONALE

This is a proposal for a new Special Topics course in Practical Approaches in Molecular Marine Sciences, which will be a hands-on course focusing on molecular techniques applied to the study of marine biological process and aquaculture. This course will provide practical labs to support lecture-based courses currently being taught, including Aquaculture and Fisheries Biotechnology (OCSC 3002), Marine Microbiology (OCSC 3600), Marine Omics (OCSC 4200) and Immunobiology of Aquatic Organisms (OCSC 4940). There are currently no hands-on laboratory courses in Marine Microbiology, Marine Immunobiology, Marine Omics, or Molecular Marine Sciences listed in the calendar and no other courses on these topics at Memorial University. This course is intended to be broad in scope, touching on aspects of fundamental marine molecular biology, but will also integrate sequencing, gene expression, immunology, and microscopy techniques applied to aquaculture and the study of marine organisms (e.g., SDS-PAGE to diagnose fish infectious disease; qPCR to study fish/bacteria responses to immune stimuli; etc.). The proposed course will be offered in alternate years, although the long-term plan is to create a regular cross-listed course with Biology (under development; see consultations). The course will be a recommended elective in the undergraduate programs offered by the Department of Ocean Sciences; it will also be useful for students in other programs who want to gain practical training in molecular biology techniques.

CALENDAR CHANGES

Not applicable to Special Topics courses.

New Course – OCSC 4945 Special Topics: Practical Approaches in Molecular Marine Sciences – 18 Nov 2021

Memorial University of Newfoundland Undergraduate Calendar Change Proposal Form Appendix Page

| From | Response Received |
|-------------------------------------------------|--------------------------|
| Grenfell campus | Yes |
| Faculty of Business Administration | No |
| Faculty of Education | No |
| Faculty of Engineering & Applied Science | Yes |
| Faculty of Humanities & Social Sciences | No |
| Faculty of Medicine | Yes |
| Faculty of Science | Yes |
| Department of Biochemistry | |
| Department of Biology | X |
| Department of Chemistry | X |
| Department of Computer Sciences | |
| Department of Earth Sciences | |
| Department of Economics | |
| Department of Geography | |
| Department of Mathematics and Statistics | |
| Department of Physics and Physical Oceanography | |
| Department of Psychology | X |
| Marine Institute | No |
| School of Human Kinetics and Recreation | No |
| School of Nursing | No |
| School of Pharmacy | Yes |
| School of Social Work | No |
| LIBRARY REPORT | Yes |

RESOURCE IMPLICATIONS

Since this new course will be taught by existing faculty and staff members at the Department of Ocean Sciences, no additional instructional costs are initially required. The pilot offering will be capped at 6 students and expanded upon request and funding availability. This course would be offered in alternate years. Should the course be a success and draw increasing enrollment, continuity will require assignment of a teaching assistant and a budget for materials and consumables (estimated at \$500, to be adjusted based on class size and consumable requirements).

SAMPLE COURSE OUTLINE AND METHOD OF EVALUATION

Prerequisite: One of OCSC 4940 or Biology 2250 (or Biochemistry 2200)

Proposed Course Outline

I. Molecular Marine Microbiology

Week 1: Culture media preparation (e.g., Trypticase soy broth, Marine broth) and marine bacterial isolation (marine environmental samples, marine invertebrate samples).

Week 2: DNA extraction from marine bacteria, PCR, gel electrophoresis, and amplicon purification.

Week 3: Sequencing and bioinformatics analysis (e.g., phylogeny, BLAST, alignment)

II. Gene Expression in Marine Organisms

Week 4: Marine organism tissue sampling (e.g., fish gut, invertebrates organs, macrophages) or marine bacteria, RNA extraction, quantification and quality evaluation.

Week 5: cDNA synthesis and gene expression normalization.

Week 6: qPCR / RT-PCR.

III. Protein Techniques Applied to Marine Organisms

Week 7: SDS-PAGE and Western Blot (e.g., detection of marine pathogens in fish tissues)

Week 8: Immunohistochemistry, epi-fluorescence, and confocal microscopy (e.g., fish cells, intracellular pathogens)

Week 9: Scanning electron, dark-field, phase-contrast microscopy of marine organisms (e.g., biofilms, micro invertebrates, marine parasites)

Week 10: Flow cytometry of fish blood exposed to different conditions (e.g., fish exposed to thermal stress or infection, crustaceans, different fish species)

Week 11: Oral Report Preparation (e.g., slide organization, speech, references; rubric will be provided)

Week 12: Oral Report Presentation (e.g., summary of techniques, observations, results, discussion; 10-15 min ppt presentation; 5 min open questions)

Format

3 hours of laboratory per week

Evaluation

- **Written Report 1**, due on week 4 (20%); (e.g., 5 pages written report on techniques and observations for section I; instructions and rubric will be provided)
- **Written Report 2**, due on week 7 (20%) (e.g., 5 pages written report on techniques and observations for section II; instructions and rubric will be provided)
- **Written Report 3**, due on week 11 (20%) (e.g., 5 pages written report on techniques and observations for section II; instructions and rubric will be provided)
- **Lab notebook**, due on week 12 (10%) (e.g., data record organization; see https://www.mun.ca/osc/graduate-program/forms/Lab_and_Field_Notebook_Guidelines.pdf)
- **Oral Presentation** (25%)
- **Participation** (5%) (e.g., attendance, questions, answers).

Bibliography (the books listed will be placed on reserve at the library)

- Sambrook, J, W Russell. 2001. *Molecular Cloning; A Laboratory Manual*. Cold Spring Harbor Press
- Bustin, S *et al.* 2009. The MIQE guidelines: minimum information for publication of quantitative real-time PCR experiments
- Zapata, A.G., Cooper, E.L, 1990. The Immune System: Comparative Histophysiology,
- Pasquier, L., Litman, G.W. , 2000. Origin and Evolution of the Vertebrate Immune System. Fish Defenses. Volume 1: Immunology, Zaccone G., Meseguer J., García-Ayala, A., Kapoor, B.G., 2009
- Evans, D.L., Jaso-Friedmann, L; Nonspecific Cytotoxic Cells and Innate Cellular Immunity in Teleost Fish. in: Recent Advances in Marine Biotechnology. Volume 5: Immunobiology and Pathology, Fingerman, M., Nagabhushanam, R. 2000
- Santander, J. and I. Fleming. **2020**. Guidelines for laboratory and field books and data. https://www.mun.ca/osc/graduate-program/forms/Lab_and_Field_Notebook_Guidelines.pdf

Instructor

Javier Santander, Associate Professor, Department of Ocean Sciences. Email: jsantander@mun.ca

Instructional support

Matt Rise, Professor, Department of Ocean Sciences. Email: mrise@mun.ca

Stephen Hill, Department of Ocean Sciences. Email: sjhill@mun.ca

Albert Caballero-Solares, Department of Ocean Sciences. Email: acaballeroso@mun.ca

APPENDIX (CONSULTATIONS)

1. CONSULTATION REQUEST

From: Annie Mercier <amercier@mun.ca>

Sent: Wednesday, October 13, 2021 9:34 AM

To: Faculty of Humanities and Social Sciences <hss@mun.ca>; Rachelle Shannahan <rshannahan@mun.ca>; Edith Furey <efurey@mun.ca>; Engineering <engrconsult@mun.ca>; HKR Dean <hkrdean@mun.ca>; Steele, Dr. Margaret: Dean of Medicine <DeanofMedicine@med.mun.ca>; School of Science Environm Grenfell <ssedean@grenfell.mun.ca>; MI UG Consultation <miugconsultations@mi.mun.ca>; Cunsolo, Ashlee <ashlee.cunsolo@mun.ca>; Karen Bulmer <kbulmer@mun.ca>; DeanNurse <DeanNurse@mun.ca>; Pharmacy <pharminfo@mun.ca>; Dean of Science <deansci@mun.ca>; adeanugradswk <adeanugradswk@mun.ca>; Ken Jacobson <kjacobse@grenfell.mun.ca>; Todd Hennessey <THENNESSEY@grenfell.mun.ca>; Library Reports <ekalcock@mun.ca>

Cc: Chris Parrish <cparrish@mun.ca>

Subject: Consultation on new special topics course in Ocean Sciences

Greetings everyone:

We are welcoming feedback on the development of a new special topics course in Ocean Sciences (Practical Approaches in Molecular Marine Sciences). See attached document. Please return your comments and feedback to me, if possible by November 3rd.

All the best,
Annie

Annie Mercier, PhD
Professor and Deputy Head UG
Department of Ocean Sciences
Memorial University
709-864-2011
amercier@mun.ca

2. FEEDBACK RECEIVED

On 2021-10-13 10:46 a.m., Hennessey, Todd wrote:

Hi Annie

Thanks for this. I'm sometimes reluctant to ask questions of programs that are well outside my area, but a few things struck me reading this document and hope you don't mind some slight interference. This looks like a very useful course for your students, and I was struck by the fact that 'there are currently no hands-on laboratory courses in...', as well as the intention to make this a 'recommended elective in the undergraduate programs...'. This course would seem to be so advantageous for students that I can't help wondering if there was thought given to making it a required course, and not a special topics course. Again, I realize I'm out of my depth (not marine joke, well, maybe a little) and there must be very good reasons, but I am curious.

New Course – OCSC 4945 Special Topics: Practical Approaches in Molecular Marine Sciences – 18 Nov 2021

As I say, this looks like a great course, and would have the support of Fine Arts.

Todd

TODD HENNESSEY, PhD (Birmingham) | DEAN

School of Fine Arts
Grenfell Campus, Memorial University
Corner Brook, Newfoundland
O: 709.637.6277
www.grenfell.mun.ca

On 2021-10-14 10:33 a.m., Annie Mercier wrote:

Hi Todd:

Many thanks for your feedback, it's always greatly appreciated.

We recently developed a number of lecture-based courses in Marine Microbiology, Marine Immunobiology, Marine Biotechnology and Marine Omics, for which there are currently no hands-on components, so we are proposing the new course to address this gap. As for why we do not make it a regular required course (instead of a special topics course), it is because (i) not all our students take the molecular path, so it would not be required for everyone; and (ii) we want to assess the uptake before investing the resources necessary for such a lab course. However, we will definitely look into making it a regular course offering if it becomes popular.

All the best,
Annie

On 2021-10-13 10:49 a.m., Davis,Erin wrote:

Hello Dr. Mercier,

Pharmacy has nothing to add regarding the proposed new special topics course in Ocean Sciences, and we have no concerns.

Thanks,
Erin

--

Erin Davis, BSc(Pharm), PharmD
Associate Professor | School of Pharmacy
Associate Dean, Undergraduate | School of Pharmacy
Chair, Committee on Undergraduate Studies | School of Pharmacy
Clinical Assistant Professor | Faculty of Medicine, Discipline of Family Medicine

Memorial University of Newfoundland and Labrador

New Course – OCSC 4945 Special Topics: Practical Approaches in Molecular Marine Sciences – 18 Nov 2021

School of Pharmacy
Health Sciences Centre
300 Prince Phillip Dr. | Rm H3443
St. John's NL | A1B 3V6

T 709 864 8815 | F 709 864 6941

On 2021-10-13 8:49 p.m., McKeen, Dolores Madeline wrote:

Dr. Mercier,

Thank you for the opportunity to review the OCSC 4945 Special Topics undergraduate calendar change on behalf of the Faculty of Medicine. We have no concerns with this proposal.

Wishing you the best, Dolores McKeen

Dolores M McKeen MD FRCPC MSc CCPE
Vice Dean | Education & Faculty Affairs
Professor | [Memorial University of Newfoundland](#)
President | [Canadian Anesthesiologists' Society](#)
@dolores_mckeen

[Faculty of Medicine](#)

Memorial University of Newfoundland
Faculty of Medicine Building | Rm 2M315
300 Prince Philip Drive
St. John's NL CA A1B 3V6
T: 709 864 6417 | F: 709 864 6336

On 2021-10-18 10:36 a.m., Deputy Head, Department of Psychology wrote:

Hi Annie-

This looks like a great course to offer students in Ocean Sciences. For our major, it could possibly be used by both Psychology/BHNR majors as one of the OCSC courses that would fulfill their 'other science' program requirements.

Best,
Carolyn

On 2021-10-20 2:08 p.m., Engineering Consult wrote:

Dear Dr. Mercier,

Thank you for the opportunity to respond to your below consultation request.

New Course – OCSC 4945 Special Topics: Practical Approaches in Molecular Marine Sciences – 18 Nov 2021

After considering this consultation request at our Committee for Undergraduate Studies, Engineering reports no impact on our program, and is happy to support this request.

Best regards,
Bruce

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

On 2021-10-22 6:07 p.m., Janet Brunton wrote:

Hi Annie,

I was just looking at OSC's new special topics course (attached), and you have Biology 2050 or Biochemistry 2250 listed as pre-requisites. I wonder if you meant Biology 2250 or Bioc 2200. We don't have a course numbered 2250, but Biology 2250 is generally considered equivalent to Bioc 2200. Although it is important to note that Bioc 2200 doesn't have a lab component. That changed when we created the lab courses.

Let me know if I can be of any help in sorting this out.

Cheers,

Janet

--

JANET BRUNTON, PhD
Professor and Deputy Head (Undergraduate)
Department of Biochemistry
Memorial University of Newfoundland
St. John's, NL A1B 3X9
709 864-8533

On 2021-10-23 3:41 p.m., Annie Mercier wrote:

Hi Janet:

Many thanks for spotting this typo. We have adjusted to "One of OCSC 4940 or Biology 2250 (or Biochemistry 2200)" since the last two are credit restricted and this string is in line with prerequisites in some of our other courses.

All the best,
Annie

New Course – OCSC 4945 Special Topics: Practical Approaches in Molecular Marine Sciences – 18 Nov 2021

On 2021-11-02 11:00 a.m., Alcock, Erin wrote:

Good morning Dr. Mercier,

Getting back to you just under the wire on this course. Sorry for the delay, I was unexpectedly off for a few weeks.

I don't expect any issues with library support for this course. If there are any techniques based works or subscriptions that we don't currently own that would be of use to the students taking the course, please keep me posted. I will also keep an eye out.

Best of luck with this proposal.

Erin Alcock

Erin Alcock
Science Research Liaison Librarian
QE2 Library
709-864-8316

On 2021-11-02 8:49 a.m., Wiersma, Yolanda wrote:

Hi again Annie,

While I'm in calendar files, we had a few other comments about the proposed course in Molecular Marine Science, in addition to the informal feedback we provided this summer.

- We feel there is quite a bit of overlap with BIOL 3950 (Research Methods in Genetic Biotechnology) and BIOL 4251 (Genomics), especially when considering this lab based course in combination with your Marine Omics course.
- We note that this course is capped at 6 students. We propose cross-listing this with biology (perhaps taking "Marine" out of the title). That way it would also attract Biology students and we could offer it in CSF, which would have more space for a larger lab group.

I realize this proposal may require a more in-depth discussion – perhaps at our joint OSC/Biology retreat? Happy to have a further discussion with you before then, though.

Best,

Yolanda

--

Dr. Yolanda Wiersma, PhD (she/her)
Professor and Acting Deputy Head (Undergraduate)
Department of Biology, Memorial University
St. John's, NL, Canada

Ph. 709.864.7499

Cell. 709.986.8543

New Course – OCSC 4945 Special Topics: Practical Approaches in Molecular Marine Sciences – 18 Nov 2021

On 2021-11-03 2:20 p.m., Annie Mercier wrote:

Hi Yolanda:

So many great exchanges today! Just tying up a loose end for the consultation process by providing our "official" replies to your comments below. I look forward to the joint committee working together to integrate our teaching resources. Thanks again for your collaboration.

Response to point 1: See further discussions about adjusting our respective course offerings below. After review by the instructors, it appears that the syllabus of BIOL 3950 and BIOL 4251 only have minimal overlap with the proposed course. BIOL 3950 and BIOL 4251 focus on primer design, microarray, PCR, RNA extraction, cloning, and RT-PCR. Although these techniques sound similar, what we are proposing is different. For instance, we are not focusing on cloning and protein expression. Also, primer design and microarrays are not part of the proposed course. PCR is the only similar technique covered, but it will be used in a different context related to marine microbiology or marine microbiota. qPCR also will be used in a different context supporting other courses besides Marine Omics (see below). The overlap accounts only for 5-10%, since the rest of the modules (90% of the proposed course; e.g., confocal microscopy, flow cytometry, scanning electron microscopy, western blots, bacterial phylogeny) are not considered in either BIOL 3950 or BIOL 4251. Therefore, the overlap is minimal. Also, the proposal is not designed to complement Marine Omics, it is primarily meant as a practical component for other courses: Marine Microbiology (OCSC3600), Immunobiology of Marine Organisms (OCSC4945), and Immunology, and Diseases of Marine Organisms (OCSC7500) although it will support/contribute to Marine Omics to some extent.

Response to point 2: Thank you for this suggestion (as you know, this mirrors our initial wish to develop better integration with Biology). We have all agreed to explore cross listing of BIOL and OCSC practical courses in the future. It will take time to find suitable teaching space in the new science core facility, and more resources (we are forming a joint BIOL/OCSC committee to look into this). In the meantime, we will pursue the proposed special topics course to make sure our students can get training in the near future. The initial cap of 6 is because the course is designed to be offered at the OSC using state-of-the-art resources that have limited access due to their nature (e.g., confocal microscope, flow cytometer, scanning electron microscope). The course is focusing on marine organisms and biology students interested in marine organisms could be attracted. We look forward to the development of cross-listed courses that could be offered more broadly.

All the best,
Annie

From: [Graham Layne](#)
To: [Kenny, Gail](#)
Cc: [J. Kim Welford](#)
Subject: RE: EASC 6120 Kinematic Modelling of Plate Tectonics - Approved
Date: Wednesday, November 24, 2021 9:39:24 AM
Attachments: [EASC 6120 Kinematic Modelling Plate Tectonics P.pdf](#)

> Gail-
>
> The above course has been approved by GSC with no objections or
> amendments.
>
> I attach the version of the proposal that was reviewed, for inclusion
> on the next Faculty Council agenda.
>
> Regards,
> Graham

Request for Approval of a Graduate Course



SCHOOL OF
GRADUATE STUDIES

Adobe Reader, minimum version 8, is required to complete this form. Download the latest version: <http://get.adobe.com/reader>. (1) Save the form by clicking on the diskette icon on the upper left side of the screen; (2) Ensure that you are saving the file in PDF format; (3) Specify where you would like to save the file, e.g. Desktop; (4) Review the [How to create and insert a digital signature](#) webpage for step by step instructions; (5) Fill in the required data and save the file; (6) Send the completed form by email to: sgs@mun.ca.

To: Dean, School of Graduate Studies
From: Faculty/School/Department/Program
Subject: Regular Course Special/Selected Topics Course

Course No.: EASC 6120

Course Title: Kinematic modelling of plate tectonics

I. To be completed for all requests:

A. Course Type: Lecture course Lecture course with laboratory
 Laboratory course Undergraduate course¹
 Directed readings Other (please specify)

B. Can this course be offered by existing faculty? Yes No

C. Will this course require new funding (including payment of instructor, labs, equipment, etc.)? Yes No
 If yes, please specify:

D. Will additional library resources be required (if yes, please contact munul@mun.ca for a resource consultation)? Yes No

E. Credit hours for this course: 3

F. Course description (please attach course outline and reading list):

This graduate course is designed to provide an in-depth understanding of how tectonic plate reconstructions are constructed and constrained. They will also gain significant hands-on experience at manipulating their own reconstruction models using the freeware package GPlates.

| G. Method of evaluation: | Percentage | |
|---------------------------------------|------------|------|
| | Written | Oral |
| Class tests | | |
| Assignments | 30 | 30 |
| Other (specify): GPlates Term Project | 30 | 10 |
| Final examination: | | |

Total 100

¹ Must specify the additional work at the graduate level

II. To be completed for special/selected topics course requests only

For special/selected topics courses, there is no evidence of:

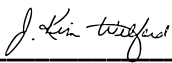
Instructor's initials

- 1. duplication of thesis work _____
- 2. double credit _____
- 3. work that is a faculty research product _____
- 4. overlap with existing courses _____

Recommended for offering in the Fall Winter Spring 20 22

Length of session if less than a semester:

III. This course proposal has been prepared in accordance with General Regulations governing the School of Graduate Studies

Dr. J. Kim Welford 

Course instructor

October 27, 2021

Date

Greg Dunning Digitally signed by Greg Dunning
DN: cn=Greg Dunning, o=Memorial University,
ou=Earth Sciences, email=gdunning@mun.ca, c=CA
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Approval of the head of the academic unit

October 27, 2021

Date

IV. This course proposal was approved by the Faculty/School/Council

Secretary, Faculty/School/Council

Date

EASC 6120: Kinematic Modelling of Plate Tectonics

Learning outcomes

To gain a basic understanding of tectonic plate reconstructions, their purpose, their constraints, and their limitations.

To gain hands-on experience with developing and adapting both rigid and deformable plate tectonic reconstructions using GPlates software, and extracting a range of derivative datasets.

Topics covered

- The concept of plate tectonics on a sphere
- Rotation vectors and Euler rotation poles
- Present-day plate boundaries
- Plate boundary changes through time
- Triple junctions
- Absolute plate motions
- Plate motion constraints
- Early plate reconstructions
- Rigid plate reconstructions in GPlates
- Deformable plate reconstructions in GPlates
- Extracting derivative information from plate reconstructions (e.g., plate motion velocities, plate motion obliquity, subsidence, crustal thickness, strain evolution, dynamic topography)

Instruction method

Reverse classroom approach of assigning readings, or topics to be researched, with the participants coming to class prepared to present and discuss the assigned readings or topics. Ultimately, they will be working with the freeware package GPlates from the Earthbyte group (<https://www.gplates.org>), mastering the tutorials and designing their own GPlates project to answer specific tectonic questions by adapting existing publicly available reconstructions.

Resources

The textbook *The Solid Earth* by C.M.R. Fowler (full citation below), as well as papers from the published literature. The students will also be using the freeware package GPlates from the Earthbyte group (<https://www.gplates.org>) and available tutorials.

Prerequisites

No specific courses are required as prerequisites for this course although a basic understanding of plate tectonics would be beneficial. Interested students are encouraged to contact the instructor to discuss their background if they are unsure.

Exercises

The students will be expected to complete readings from the Solid Earth textbook and from the published literature, demonstrating their understanding by writing reading summaries and doing presentations on the basic concepts. Written assignments involving problem solving of tectonic plate problems will be assigned early in the semester. No more than one deliverable will be expected each week. As the students begin to use the GPlates software during the latter half of the semester, they will be presenting their experiences with the tutorials to each other on a weekly basis.

Project

Each student will ultimately create their own GPlates project to address a specific tectonic question of interest to them. They will adapt existing GPlates projects already published in the literature and will experiment with both rigid plate reconstructions and deformable ones. The project theme will be selected and defined in consultation with the course instructor. A written report (~4000 words in length) and an oral presentation are expected at the end of the semester. The oral presentation will be 15-20 minutes long and will be presented in class at the end of the semester.

Assessment

20% reading summaries
 10% written assignments
 15% concept presentations
 15% GPlates tutorial presentations
 40% GPlates project (written report (30%) and oral presentation (10%))

Textbook

Fowler, C.M.R. 2005. *The Solid Earth: an introduction to global geophysics*. Cambridge, UK: Cambridge University Press.

Relevant papers from the literature, such as:

Ady, B.E., and Whittaker, R.C., 2018. Examining the influence of tectonic inheritance on the evolution of the North Atlantic using a palinspastic deformable plate reconstruction. *Geological Society Special Publications*, 470, 245-264, doi:10.1144/SP470.9.

Becker, T.W., 2006. On the effect of temperature and strain-rate dependent viscosity on global mantle flow, net rotation, and plate-driving forces. *Geophysical Journal International*, 167, 2, 943-957, doi:10.1111/j.1365-246X.2006.03172.x.

Becker, T.W., Schaeffer, A.J., Lebedev, S., and Conrad, C.P., 2015. Toward a generalized plate motion reference frame. *Geophysics Research Letters*, 42, 9, 3188-3196, doi:10.1002/2015GL063695.

Bullard, E., Everett, J.E., and Smith, A.G., 1965. The fit of the continents around the Atlantic. *Philosophical Transactions of the Royal Society of London, Series A, Mathematical and Physical Sciences*, 258, 1088, 41-51.

Gee, J.S., and Kent, D.V., 2007. Source of oceanic magnetic anomalies and the geomagnetic polarity timescale. *Treatise on Geophysics*, 5, 455-507, doi:10.1016/B978-044452748-6.00097-3.

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- Müller, R.D., Cannon, J., Qin, X., Watson, R.J., Gurnis, M., Williams, S., et al., 2018. GPlates: Building a virtual Earth through deep time. *Geochemistry, Geophysics, Geosystems*, 19, doi:10.1029/2018GC007584.
- Müller, R.D., Zahirovic, S., Williams, S.E., Cannon, J., Seton, M., Bower, D.J., Tetley, M.G., Heine, C., Le Breton, E., Liu, S., Russell, S.H.J., and Yang, T., 2019. A global plate model including lithospheric deformation along major rifts and orogens since the Triassic. *Tectonics*, 38, 6, 1884-1907, doi:10.1029/2018TC005462.
- Nirrengarten, M., Manatschal, G., Tugend, J., Kuszniir, N., and Sauter, D., 2018. Kinematic evolution of the southern North Atlantic: Implications for the formation of hyperextended rift systems. *Tectonics*, 37, 89-118, doi:10.1002/2017TC004495.
- Peace, A.L., Welford, J.K., Ball, P.J., Nirrengarten, M., 2019. Deformable plate tectonic models of the southern North Atlantic. *Journal of Geodynamics*, 128, 11-37, doi:10.1016/j.jog.2019.05.005.
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Williams, S.E., Whittaker, J.M., Halpin, J.A., and Müller, R.D., 2019. Australian-Antarctic breakup and seafloor spreading: balancing geological and geophysical constraints. *Earth-Science Reviews*, 188, 41-58.

Williams, S., Wright, N.M., Cannon, J., Flament, N., and Müller, R.D., 2021. Reconstructing seafloor age distributions in lost ocean basins. *Geoscience Frontiers*, 12, 2, 769-780.