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, February 19, 2014, at 1 p.m. in C-2045.

AGENDA

1. Regrets
2. Adoption of the Minutes of January 15, 2014
3. Business Arising from the Minutes
4. Correspondence: None
5. Reports of Standing Committees:
   A. Undergraduate Studies Committees:
      b. Department of Chemistry and Department of Ocean Sciences, proposal for new course, CHEM 2600/OCSC 2200, Introductory Chemical Oceanography, paper 5.A.b (11 pages).
   B. Graduate Studies Committee:
      a. Department of Ocean Sciences, calendar changes, Marine Biology Graduate Program, paper 5.B.a (4 pages).
      b. Interdisciplinary Programs, special topics course, ENVS 6204, Forest Sector Transformation, paper 5.B.b (5 pages). Approved by the committee and included for information only.
   C. Nominating Committee: None
   D. Library Committee: None
6. Reports of Delegates from Other Councils
   Anna Hicks, DELTS Representative
7. Faculty of Science Strategic Plan - Annual Approval, paper 7 (5 pages).
8. Faculty of Science Awards Committee
   Terms of Reference, for information and discussion only, paper 8 (1 page).
10. Question Period
11. Adjournment

Mark Abrahams
Dean of Science
A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, January 15, 2014, at 1:00 p.m. in room C-2045.

FSC 2234  Present
Biochemistry
Mulligan, M.E.

Biology
Leroux, S.

Chemistry
Pickup, P.

Computer Science
Banzhaf, W.  Kolokolova, A.  Pena-Castillo, L.

Earth Sciences
Hanchar, J.

Math & Stats
Loredo-Osti, J.  Pike, D.  Radford, C.  Sullivan, S.

Ocean Sciences
Fletcher, G.

Physics & Physical Oceanography
de Young, D.  Yethiraj, A.

Psychology
Martin, G.

Dean of Science
Abrahams, M.  Foss, K.  Foster, A.  Rideout, J.  Zedel, L.

Education
Vaandering, D.
Arts Council
Bishop, N.

School of Music
Cook, N.

Graduate Students
Adeniyi, Balogun

Undergraduate Students
Grant, Devin          Kennedy, Sean          Murphy, Ryan

FSC 2235  Regrets
Erin Alcock
Donna Stapleton

FSC 2236  Adoption of Minutes
It should be noted that Neil Bishop was present at the last meeting but was not listed as being present. **Moved:** Minutes of the December 11 meeting be adopted as amended. (Sullivan/Fletcher). **Carried.**

FSC 2237  Business Arising
It was asked whether any discussion had occurred regarding offering combined graduate and undergraduate courses. Unfortunately, a meeting could not be convened due to the holiday period.

FSC 2238  Correspondence: None

FSC 2239  Reports of Standing Committees:

A. Undergraduate Studies Committee:
Shannon Sullivan, Chair of the Committee, noted that departments should begin the process of initiating calendar changes for the 2014/15 academic year.

B. Graduate Studies Committee: None

C. Nominating Committee: None

D. Library Committee: None

FSC 2240  Reports of Delegates from Other Councils: None

FSC 2241  Faculty of Science Strategic Plan - Annual Approval
It was decided that a vote would not occur at this meeting to approve the Faculty of Science strategic plan. Department Heads will seek feedback from
members of their department and will then be in a better position to vote at the next meeting of Faculty Council. Kelly Foss, Communications Coordinator for the Faculty of Science, commented that departments should advise her if links to departmental strategic plans aren’t included in the Faculty of Science strategic plan. The Dean noted that the assumptions underlying the strategic plan have proven accurate and the plan itself is an important tool to guide decision making.

**FSC 2242 Faculty-wide Teaching Equivalencies**

The Dean announced that when a new MUNFA collective agreement is signed he will be asking Faculty Council to vote on whether they agree to proceed with a faculty-wide teaching equivalency document. The vote has to occur within 60 days of the signing of the collective agreement. The next step would be to establish a committee to draft a teaching equivalency document which has to be presented to the Dean for approval within 100 days of the signing. There was considerable discussion on this matter, and it was agreed that it would become an item for consideration at the next Heads’ meeting.

**FSC 2243 Report of the Dean:**

Presented by Mark Abrahams, Dean.

During the blizzard and resulting power outage over the holidays, the university did suffer some damage, primarily due to pipes freezing, bursting and creating extensive water damage. Fortunately, damage within the Faculty of Science was limited.

On Friday, January 10, the contract for the architectural and engineering design for the new Science building was awarded to HOK architects in Toronto and their local partner, Hearn Fougere architects. These companies are the primary consultants on the project and will include other companies with expertise in architectural design, lab planning and educational design, interior design, furniture, LEED & sustainability, lighting, flooring, signage, mechanical & electrical systems, structural engineering, civil engineering, cost consultants, IT/communication systems, geotechnical analysis, code issues, environmental components, traffic, and EMF/RFI.

In December, the Dean was approached by Hebron to submit a proposal on a public education building to be based out of Logy Bay. As this will impact Ocean Sciences more than any other unit, they prepared a draft proposal. However, given the scale of the potential project it was felt that this proposal needs to be a pan-university initiative. The Dean convened a meeting of representatives from throughout the Faculty of Science, Arts, Engineering and MI. All are now submitting components that they would like to see within this proposal. The Dean and Dr. Garth Fletcher will consolidate this information into a final proposal to be forwarded to Hebron for its consideration next week.
Video conferencing equipment was recently installed in four locations within the Faculty of Science: Bonne Bay, Ocean Sciences, the Dean of Science Boardroom and the Biology Department seminar room. This equipment is available to all faculty, and it is hoped that it will facilitate conferencing in such areas as graduate student supervisory committee meetings.

There will be a town hall meeting for all undergraduate Science students to meet with the Dean in IIC 2001 on Wednesday, January 22 at 1 pm. The purpose of the meeting is to give undergraduate students the opportunity to get direct information on the new core Science building and to solicit their financial support for a Science Endowment Fund to insure that we properly maintain and equip our undergraduate teaching labs.

**FSC 2244**  **Question Period**
Mike Morrow noted that there was also water damage over the holidays to labs on the first floor of the Chemistry building. This type of damage has occurred in the past when FM turns down the heat in the building during closures. The Dean will discuss this concern with FM.

**FSC 2245**  **Adjournment:**
The meeting adjourned at 1:30 p.m.
February 11, 2014

TO: All Members, Faculty Council of Science
FROM: Joan Burry, Secretary
       Committee on Undergraduate Studies, Faculty of Science
SUBJECT: New Course Proposals

At a meeting held on February 7, 2014, the Undergraduate Studies Committee of the Faculty of Science agreed that the following new course proposals be forwarded to Faculty Council for approval:

1. Department of Ocean Sciences
   (i) OCSC 2000: Introductory Biological Oceanography
   (ii) OCSC 2001: Introduction to Sustainable Fisheries Aquaculture
   (iii) OCSC 3000: Aquaculture Principles and Practices

2. Department of Chemistry and Department of Ocean Sciences
   CHEM 2600/OCSC 2200: Introductory Chemical Oceanography

Joan Burry
Assistant Registrar and
Secretary, Committee
on Undergraduate Studies,
Faculty of Science
Proposal
New Course

OCSC 3000: Aquaculture Principles and Practices

Executive Summary

This new course, Aquaculture Principles and Practices, will be taught as one of the four core courses required for the proposed Minor in Aquaculture and Fisheries.

Resource Implications: Instructional Costs

This course will use teaching resources currently available in the Department of Ocean Sciences and at the Marine Institute. However, additional instructional resources (i.e. teaching assistants, and equipment and supplies) are required for the laboratories.

The course will be taught by members of the Department of Ocean Sciences and the Marine Institute, primarily Drs. Kurt Gamperl and Jillian Westcott. However, other faculty/staff will contribute as guest lecturers.

Library Holdings and/or Other Resources Required

The library has significant holdings of books on the topic of aquaculture, and access to all of the major journals relevant to this discipline (see list under Library Holdings).

Signature of Unit Head: ____________________________________________

Date: ____________________________________________________________

Signature of Dean/Associate Vice-President (Academic)/Vice-President: ____________________________________________

Date: ____________________________________________________________
Sample Course Outline and Method of Evaluation

There will be two 1.25 hour (75 min.) lectures per week and one 3 hour laboratory per week.
A tentative schedule of the topics to be covered in this course is shown below.

Lectures:

<table>
<thead>
<tr>
<th>Week</th>
<th>Subject (Topic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Aquaculture (History and Economics)</td>
</tr>
<tr>
<td>2</td>
<td>Aquaculture Systems Design and Operations</td>
</tr>
<tr>
<td>3</td>
<td>Broodstock and Egg Production</td>
</tr>
<tr>
<td>4</td>
<td>Finfish Culture</td>
</tr>
<tr>
<td>5</td>
<td>Finfish Culture Cont’d</td>
</tr>
<tr>
<td>6</td>
<td>Shellfish Culture</td>
</tr>
<tr>
<td>7</td>
<td>Cage-Site Production</td>
</tr>
<tr>
<td>8</td>
<td>Integrated Multi-Trophic Aquaculture (IMTA)</td>
</tr>
<tr>
<td>9</td>
<td>Fish Health / Biosecurity</td>
</tr>
<tr>
<td>10</td>
<td>Feeding and Nutrition</td>
</tr>
<tr>
<td>11</td>
<td>Genetics and Biotechnology</td>
</tr>
<tr>
<td>12</td>
<td>Harvesting and Processing / Quality Control</td>
</tr>
<tr>
<td>13</td>
<td>Aquaculture and the Environment</td>
</tr>
</tbody>
</table>

Labs: Note, labs will be taught in the Dr. Joe Brown Aquatic Research Building (JBARB) and at the aquaculture facility in the Marine Institute.

<table>
<thead>
<tr>
<th>Week</th>
<th>Subject (Topic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anatomy and Animal Husbandry</td>
</tr>
<tr>
<td>2</td>
<td>Systems Design and Operations 1</td>
</tr>
</tbody>
</table>
3  Systems Design and Operations 2
4  Broodstock and Egg Production
5  Live Food Technology – Marine Finfish
6  Larval Rearing – Marine Finfish
7  Salmonid Rearing and Technology
8  Shellfish Culture – Mussels
9  Shellfish Culture – Oysters /Lobsters
10 Fish Health Management and Biosecurity
11 Fish Feeding and Nutrition
12 Laboratory Exam

Evaluation:

Mid-Term Exam 15%
Final Examination 25%
Major Paper 20%
Laboratory (Participation, Write-Ups and Exam) 40%

Texts


Supplementary Texts (on Reserve)

Cold-Water Aquaculture in Atlantic Canada. ISBN 0-88659-033-7

Instructors

Kurt Gamperl and Jillian Westcott, with Guest Lecturers
SUMMARY PAGE FOR SENATE

Approval Form

Course Number and Title: 3000: Aquaculture Principles and Practices

Abbreviated Course Title: Aquaculture Production

Calendar Description

OCSC 3000 Aquaculture Principles and Practices emphasizes the techniques and methods used to culture finfish and shellfish, with a primary focus on Canadian aquaculture species. Basic aspects of aquaculture will be covered, including the design and maintenance of production systems, culture techniques, and the nutrition, health, physiology and reproduction of finfish and shellfish. The laboratory portion of this course will provide students with practical experience in the maintenance of land-based aquaculture production systems and in the husbandry / culture of aquatic organisms.

LH: 3
PR: OCSC 2001, or OCSC 1000 and BIOL 1002.

Rationale

The Department of Ocean Sciences requires this course as one of the four core courses in the proposed new Minor in Aquaculture and Fisheries Programme.

Consultations Sought From

| Marine Institute | Yes |
| Grenfell campus | No |
| Department of Biochemistry | No |
| Department of Biology | Yes |
| Department of Chemistry | No |
| Department of Computer Sciences | No |
| Department of Economics | No |
| Department of Earth Sciences | No |
| Department of Geography | No |
| Department of Mathematics and Statistics | No |
| Department of Ocean Sciences | No |
| Department of Physics and physical Oceanography | No |
| Department of Psychology | No |
| Faculty of Engineering | Yes |
| Faculty of Business Administration | No |
| Faculty of Education | No |
| Faculty of Arts | No |

Library Report Received: Yes
Signature: Dean, Associate Vice-President (Academic) or Vice-President

Name

FOR OFFICE USE ONLY

APPROVAL GRANTED BY SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Chair:

Secretary:

Date:
Marine Institute Correspondence

-----Original Message-----
From: Fletcher, Garth
Sent: January-23-14 1:48 PM
To: Derek Howse
Subject: RE: Two new course proposals

Dear Derek. Here is our response to Cyr's comments.

"The purpose of this introductory course is to introduce students to the breadth of issues surrounding sustainable fisheries and aquaculture. It is not the intention to delve into depth on these subjects, many of which are covered quantitatively in BIOL4750 Fisheries Ecology. It would seem a disservice to the students not to introduce them to the diversity that constitutes fisheries and aquaculture. Dr. Fleming, while at Oregon State University (2001-04), co-taught two courses covering fisheries management (touching on socioeconomic issues as well) – FW 420/520 Ecology and Management of Marine Fishes and FW 426/526 Coastal Ecology and Resource Management. He also has direct experience working with fisheries management issues – e.g., he worked for nearly 10 years as a research scientist for the Norwegian Institute of Nature Research (a semi-independent research arm of the Norwegian government; http://www.nina.no/ninaenglish/Start.aspx) that has the mandate to provide science for management. While at Oregon State University, Dr. Fleming was part of the Coastal Oregon Marine Experiment Station, which focuses on marine fisheries management, resource dynamics, ecology, economics, genetics, marketing and sustainability (see http://marineresearch.oregonstate.edu/). He has also recently sat on an expert panel and co-authored a report for the Royal Society of Canada entitled Sustaining Canadian Marine Biodiversity: responding to the challenges posed by climate change, fisheries, and aquaculture (http://rscsrc.ca/sites/default/files/pdf/RSC_MBD_1325_Twenty-Five_EN_FORMAT.pdf), co-writing chapters on Canadian aquaculture and fisheries."

Best regards

Garth

-----Original Message-----
From: Derek Howse [mailto:Derek.Howse@mi.mun.ca]
Sent: January-23-14 6:50 AM
To: Fletcher, Garth
Cc: Cyr Couturier
Subject: FW: Two new course proposals

Garth,

I would invite you to review the further response from Cyr below. Perhaps further consultation between our Aquaculture unit and your own group would be in order to resolve any outstanding issues?

Derek

From: Cyr Couturier <Cyr.Couturier@mi.mun.ca><mailto:Cyr.Couturier@mi.mun.ca>>
Date: Wednesday, 22 January, 2014 4:16 PM
To: Derek Howse <derek.howse@mi.mun.ca><mailto:derek.howse@mi.mun.ca>>
Cc: Cyr Couturier <Cyr.Couturier@mi.mun.ca><mailto:Cyr.Couturier@mi.mun.ca>>
Subject: RE: Two new course proposals
Still does not address the content issues in OSC 2001....the inclusions of fisheries management and socioeconomics in an intro course on fisheries and aquaculture science still seems a little odd in my view. ....and unless they have expertise in socioeconomics and fisheries management, I am fairly certain the proposed profs do not have actual FM backgrounds ....yes, Dr. Fleming has some experience teaching on the ecological aspects of fisheries biology, but fisheries management per se? I don’t know as I have not seen a recent CV but that is my sense. Regardless, this content piece just seems out of place for this course, as I tried to indicate in my first note.

So, I think the course will be much better and more focused if they stick to the basics for this second year course, and not move into areas that are somewhat out of context for an Intro course in Fisheries and Aquaculture anyway.

For OSC 3000, the course “outline” was developed by one MI faculty member with one OSC faculty, and not a real joint effort.....to date. However, all I was pointing out was the need to clarify the content a bit and not focus on non-commercial species and to provide a good transition from year 1 and 2 level biology courses, that are prerequisites. In other words, the general outline looks fine but the actual course syllabus needs to be developed a bit more.

Feel free to pass these comments along to Dr. Fletcher and the UGSC.

Cyr

Cyr Couturier
Research Scientist and Chair, Aquaculture Programs Marine Institute of Memorial University Box 4920, St. John’s, NL Canada A1C 5R3
Tel: 1.709.778.0609
Cel: 1.709.691.9139
Fax: 1.709.778.0535
E-mail: cyr@mi.mun.ca

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From: Derek Howse
Sent: Wednesday, January 22, 2014 3:29 PM
To: Cyr Couturier
Subject: FW: Two new course proposals

Cyr,

Do you feel any further response is required on this matter?

Derek

From: <Fletcher>, Garth <fletcher@mun.ca>
Date: Wednesday, 22 January, 2014 3:24 PM
To: Derek Howse <miugconsultations@mi.mun.ca>, "Parrish, Chris" <cparrish@mun.ca>
Cc: Derek Howse <derek.howse@mi.mun.ca>, "Parrish, Chris" <cparrish@mun.ca>
Subject: RE: Two new course proposals

Dear Derek: Thank you for forwarding Mr. Couturier’s comments on OCSC2001 & 3000 which we see as being two of the required courses in the minor in Aquaculture and Fisheries that we are developing in consultation with
the Marine Institute. The purpose of the 2nd year course is to introduce students to the breadth of sustainable fisheries and aquaculture, and Dr. Fleming has direct experience both teaching and working on fisheries management issues. The proposal for OCSC 3000 has already been developed in collaboration with the Marine Institute. We would also welcome MI participation in the OCSC 2001 course in the form of guest lectures.”

Best regards

Garth

From: Dawn King [mailto:Dawn.King@mi.mun.ca] On Behalf Of MIUG Consultations
Sent: December-23-13 10:30 AM
To: Fletcher, Garth
Cc: Derek Howse
Subject: RE: Two new course proposals

Dr. Fletcher,

Thank you for the opportunity to review the two proposed new courses OCSC2001 and 3000. I forwarded the course outlines for comment to our Aquaculture department here at the Marine Institute. The following are the comments received from Mr. Couturier and I would suggest follow up conversation directly with him.

Cyr Couturier
Research Scientist and Chair, Aquaculture Programs Marine Institute of Memorial University Box 4920, St. John’s, NL Canada A1C 5R3
Tel: 1.709.778.0609
Cel: 1.709.691.9139
Fax: 1.709.778.0535
E-mail: cyr@mi.mun.ca<mailto:cyr@mi.mun.ca>.

"Hi Derek,

You will find my comments on the two proposed new courses from the OSC in each of the attached, and summarized below:

OCSC2001:

- This is an introductory course to sustainable fisheries and aquaculture. However, there is a very broad range of topics proposed to be covered over 2 lectures per week for 13 weeks.

- Topics 6 and 7 (stock assessment and socioeconomics, and fishery management) seem out of place in this course. This is not appropriate for a second year science course in my view.

- These topics are actually covered in the Master of Marine Studies – Fishery Resource Management program. Moreover, under the Memorial University Act, I believe the MI is accorded the obligation and right to deliver applied fishery research AND program delivery, so these topics should be covered by MI personnel.

- In addition, the proposed instructors do not have backgrounds in these topics from what I can discern, either in socioeconomics or fishery management. If they wish to include these topics in the syllabus, it would be advisable to have someone from MI School of Fisheries (CFER, aquaculture or fishery management) deliver these topics.
Some of this proposed course content is offered by MI diploma and advanced diploma programs and masters programs, so how do we deal with this?

OCSC3000:

- Outline of the course looks good...

- Some of the topics however, need to be developed ....for example, topic 1 covers history and economics, and one of the prerequisites is a Biology course. So, theoretically, a student with no background on the scope of aquaculture production globally or in Canada, will not get this from this course. The first topic would be much better covering production, economics, marketing and history.

- Several of the topics covered in the proposed outline, are already covered in a variety of AQUA courses at the MI, and this applies to the labs as well (about 32 of those). Would it not be better to have students in this course / program take those sections offered at the MI in the MISA program, rather overlap?

- It is not clear from the proposed outline of topics that the course will focus on Canadian species of commercial importance or not?.....The course description suggests it will but I could see it easily go into marine finfish production which with one exception, is relegated to BC (sablefish). The emphasis in these topics (broodstock and finfish culture) should be the salmonids, followed by say sturgeon, and then one small example of a marine finfish – sablefish, for example. It would be inappropriate to use cod for most examples in this course as it is not commercial nor is it being pursued as such most anywhere in the world.

So, in short, there are some overlaps in our programs with both OCSC2001 and OCSC3000, but I think if the MI faculty are included in the teaching of OCSC 3000 lectures and labs mostly, this would cover this concern.

For the OCSC2001 course, some structure changes are needed, and I am not certain the faculty proposed to teach the outline as it is now, are able to deliver some of the content they propose, and primarily the management and socioeconomic aspects."

Derek Howse  
Chair, Undergraduate Studies Committee  
Marine Institute, Memorial University  
TEL: 709-778-0586  
FAX: 709-778-0394  
Derek.Howse@mi.mun.ca<mailto:Derek.Howse@mi.mun.ca>

From: Fletcher, Garth [mailto:Fletcher@mun.ca]  
Sent: Monday, November 25, 2013 4:31 PM  
To: Arts; Biochemistry Head; Brad de Young; Business; cs-chair@mun.ca<mailto:cs-chair@mun.ca>; wlocke@mun.ca<mailto:wlocke@mun.ca>; Education; Engineering; Erin Alcock; Geography; gjenner@mun.ca<mailto:gjenner@mun.ca>; Ian Neath; Marino, Paul; mathconsult@mun.ca<mailto:mathconsult@mun.ca>; MIUG Consultations; Peter Pickup, Chemistry; Taylor-Harding, Dianne; vpoffice@grenfell.mun.ca<mailto:vpoffice@grenfell.mun.ca>  
Cc: Parrish, Chris; deansci@mun.ca<mailto:deansci@mun.ca>  
Subject: Two new course proposals
Colleagues please find attached proposals for OCSC 2001 and OCSC 3000. These courses have been developed as two of the four core courses for a Minor in Aquaculture and Fisheries.
Please send any comments you may have to me at your earliest convenience.

Best regards

Garth
PS my apologies for forgetting to include the attachments in my last email on this subject.

Garth L. Fletcher
Head and Professor Emeritus
Department of Ocean Sciences
Ocean Sciences Centre
0 Marine Lab Road
St John’s NL
Canada
A1C 5S7

Tel: 709-864-3276
Fax: 709-864-3220

Department of Biology Correspondence
Dear Karen,
Thank you for your comments on our proposal for OCSC 2001 & 3000. We have discussed the request for a credit restriction with Biology 4750 with the Ocean Sciences faculty member who delivers the course. Joe Wroblewski feels there is only minimal overlap between the courses and that in fact, OCSC 2001 would make an excellent preparatory course for Biology 4750. In addition we are hoping to have Biology 4750 as an important required course in the Minor in Aquaculture and Fisheries that we are developing and so credit restriction would eliminate it from the minor. Therefore we do not agree to putting a credit restriction on BIOL 4750 for OCSC 2001.

Best regards

Garth

From: Karen Morris [mailto:morrisk@mun.ca]
Sent: December-20-13 9:50 AM
To: Fletcher, Garth
Cc: Parrish, Chris; Marino, Paul
Subject: Re: FW: Two new course proposals

Hi Garth,
The Biology Undergraduate Studies Committee reviewed the two new course proposals for inclusion in the planned new minor in Aquaculture and Fisheries.
We have no issues or concerns regarding the proposal for OCSC3000, we do however note that the topics to be covered in OCSC 2001- Introduction to Sustainable Fisheries and Aquaculture are for the most part, ones that are covered in Biology 4750 Fisheries Ecology.
Based on the information contained in the proposal for OCSC2001- Introduction to Sustainable Fisheries and Aquaculture we request that a credit restriction of Biology 4750 be added to the calendar description for OCSC 2001.

Thanks
Karen
Karen Morris  
Undergraduate Officer  
Dept. of Biology  
Memorial University of Newfoundland  
St. John's, NL A1B 3X9  
709-864-8021  

On 26/11/2013 1:26 PM, Marino, Paul wrote:

From: Fletcher, Garth  
Sent: November 25, 2013 4:31 PM  
To: Marland, Alex; Biochemistry Head; 'Brad de Young'; Business Undergrad Help; 'cs-chair@mun.ca'; Economics (jylocke@mun.ca); Galway, Gerald J.; Engineering; Alcock, Erin; Geography; 'gjenner@mun.ca'; 'Ian Neath'; Marino, Paul; 'mathconsult@mun.ca'; 'miugconsultations@mi.mun.ca'; 'Peter Pickup, Chemistry'; Taylor-Harding, Dianne; 'vpoffice@grenfell.mun.ca'  
Cc: Parrish, Chris; Dean of Science  
Subject: Two new course proposals

Colleagues please find attached proposals for OCSC 2001 and OCSC 3000. These courses have been developed as two of the four core courses for a Minor in Aquaculture and Fisheries. Please send any comments you may have to me at your earliest convenience.

Best regards

Garth

Faculty of Engineering Correspondence  
-----Original Message-----
From: Engineering Consultations [mailto:engrconsult@mun.ca]  
Sent: November-29-13 2:33 PM  
To: Fletcher, Garth  
Cc: Edmunds, Jayde; Fisher, Andrew; Glyn George; Geoff Rideout  
Subject: Re: Consultation Requests OCSC 2000, 2001, 2300 & 3000

Thank you Dr. Fletcher for the opportunity to comment on the proposed Calendar changes for the four new courses OCSC 2000, 2001, 2300 and 3000.

As Chair of the Committee on Undergraduate Studies of the Faculty of Engineering and Applied Science, I can report that these proposed changes have no impact on the Faculty.

Dr. Glyn George, Chair  
Committee on Undergraduate Studies  
Faculty of Engineering and Applied Science Memorial University of Newfoundland  
St. John’s  NL  A1B 3X5
10 February 2014

To: Garth Fletcher  Department of Ocean Sciences

From: Erin Alcock,  Science Research Liaison Librarian

Subject: New Course Proposal, OCSC 3000

I have reviewed the new course proposal for OCSC 3000 – Aquaculture Principles and Practices, and have determined that the Memorial University Library system has sufficient resources to support the course objectives.

The summary of library holdings below indicates ample monograph titles in this subject area, held both in the Queen Elizabeth II Library and the C.R. Barrett Library, as well as, more than sufficient coverage from article indexes. Any additional resources required could be purchased under allocations for biology, physics and physical oceanography, the Marine Institute Library and other appropriate funds. The major journals in this area are well covered.
Library Holdings Summary

Table One: General Course Subject Themes

<table>
<thead>
<tr>
<th>Course Topic</th>
<th>LCSH</th>
<th>Keywords</th>
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<tbody>
<tr>
<td>Aquacult$ AND finfish</td>
<td>46</td>
<td>74</td>
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<tr>
<td>AND shellfish</td>
<td></td>
<td>171</td>
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<td>AND production</td>
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<td>175</td>
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<tr>
<td>AND physiol$</td>
<td>9</td>
<td>52</td>
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<tr>
<td>AND reprod$</td>
<td></td>
<td>121</td>
</tr>
</tbody>
</table>

*as of date of memo

Table Two: Selected Article Indexes and Databases

<table>
<thead>
<tr>
<th>Article Indexes and Databases</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASFA: Aquatic Science and Fisheries Abstracts</td>
</tr>
<tr>
<td>Biological Abstracts</td>
</tr>
<tr>
<td>CAB Abstracts</td>
</tr>
<tr>
<td>Scopus</td>
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<tr>
<td>Web of Science</td>
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</table>
February 11, 2014

TO: All Members, Faculty Council of Science

FROM: Joan Burry, Secretary
       Committee on Undergraduate Studies, Faculty of Science

SUBJECT: New Course Proposals

At a meeting held on February 7, 2014, the Undergraduate Studies Committee of the Faculty of Science agreed that the following new course proposals be forwarded to Faculty Council for approval:

1. Department of Ocean Sciences
   (i) OCSC 2000: Introductory Biological Oceanography
   (ii) OCSC 2001: Introduction to Sustainable Fisheries Aquaculture
   (iii) OCSC 3000: Aquaculture Principles and Practices

2. Department of Chemistry and Department of Ocean Sciences
   CHEM 2500/OCSC 2200: Introductory Chemical Oceanography

Joan Burry
Assistant Registrar and
Secretary, Committee
on Undergraduate Studies,
Faculty of Science
Proposal
New Course – Cross listed
CHEM 2600/OCSC 2200 Introductory Chemical Oceanography

Executive Summary

This new course, Introductory Chemical Oceanography, will be taught as one of the five core courses for the Minor in Oceanography, proposed by the Department of Ocean Sciences.

Resource Implications: Instructional Costs

This course will use the teaching resources currently available in the Departments of Chemistry and Ocean Sciences. The course could be taught by several members of the Department of Chemistry, including Christina Bottaro, Robert Helleur, Fran Kerton, and Cora Young and by a member of the Department of Ocean Sciences, Christopher Parrish.

Library Holdings and/or Other Resources Required

There are no other costs associated with the proposed new course.

Signature of Unit Head (if appropriate):

Date:

Signature of Dean/Associate Vice-President (Academic)/Vice-President:

Date:
Sample Course Outline and Method of Evaluation

The proposed new course will be taught as a regular lecture course, with no laboratories.

Course Outline

1 Getting Started
   a) The history of oceanography since the Challenger expedition.
   b) An introduction to modern environmental chemistry and chemical oceanography.
   c) An introduction to chemometrics.

2 Fundamental Properties of Seawater and Sediments
   a) Properties of water and the effect of salt.
   b) Salinity, temperature, pressure, and density.
   c) Origin and classification of sediments.
   d) Distribution of sediment deposits.

3 Chemical Composition of Seawater
   a) Major constituents, minor, and trace constituents.
   b) Chemical speciation in the ocean.
   c) Production and composition of the sea-surface microlayer.
   d) Suspended and settling particulate matter, colloids, and dissolved material.
   e) Solubility of gases.

4 Water Masses, Ocean Circulation and Mixing
   a) Water masses and surface currents.
   b) Upwelling and thermohaline circulation.
   c) Temperature-Salinity diagrams and mixing processes in the oceans.
   d) Radioisotopes and the determination of rates.

5 Chemical Fate in the Oceans
   a) Ocean-atmosphere exchange.
   b) Hydrolysis reactions.
   c) Photolysis reactions.
   d) Redox chemistry of seawater.
   e) Stable isotopes and fractionation.

6 Chemical Sedimentology
   a) Diagenesis.
   b) Weathering and reverse weathering reactions.
   c) The carbonate system and ocean acidification.
   d) Iron-manganese nodules.
   e) Hydrothermal reactions and fluxes.

7 Biogeochemical Cycling in the Oceans I
   a) Box models.
   b) Cycling of biolimiting elements E.g. P, N, Si.
   c) Global carbon cycle.
8 Biogeochemical Cycling in the Oceans II
   a) Nitrogen.
   b) Organic matter.
   c) Trace metals.

9 Coastal Marine Chemistry
   a) Mixing of substances injected into the ocean.
   b) Biological activity and kinetic fractionation of C and N stable isotopes.
   c) Biogenic and lithogenic suspended particles.
   d) Retention of introduced substances near the coast.

10 The Oceans as a Waste Space
   a) Marine pollution.
   b) Long-range transport of pollutants in the ocean.

11 Renewable Chemical Resources from the Ocean
   a) Algae including its use in biodiesel production.
   b) Approaches to valorisation of fishery and aquaculture waste streams.
Evaluation:
Assignments 30%
Mid-term test 25%
Final examination 45%

A total of 6 assignments will be given throughout the term.

Texts


Supplementary Texts (on reserve)
‘Marine Biogeochemical Cycles’ The Open University (R. James), 2005. [GC111.2 M36 2005]

Instructor(s)

Usually two from Christina Bottaro, Robert Helleur, Fran Kerton, Christopher Parrish and Cora Young.
SUMMARY PAGE FOR SENATE
Approval Form

Course Number and Title: CHEM 2600 Introductory Chemical Oceanography
OCSC 2200 Introductory Chemical Oceanography

Abbreviated Course Title: Chem. Oceanography

Calendar Descriptions

CHEM 2600 Introductory Chemical Oceanography (same as OCSC 2200) provides an introduction to the fundamental chemical properties of seawater and the processes governing the concentrations of elements and compounds in the oceans. It is an introduction to the sources, distribution, and transformations of chemical constituents of the ocean, and their relation to biological, chemical, geological, and physical processes. Topics include: controls on average concentration of chemicals in the ocean; vertical and horizontal distributions of ocean constituents; air-sea interactions; production, export, and remineralization of organic matter; the ocean carbon cycle; human-induced changes; stable isotopes; and trace elements.

CR: OCSC 2200
PR: CHEM 1011 OR CHEM 1051 which may be taken concurrently OR CHEM 1001

OCSC 2200 Introductory Chemical Oceanography (same as CHEM 2600) provides an introduction to the fundamental chemical properties of seawater and the processes governing the concentrations of elements and compounds in the oceans. It is an introduction to the sources, distribution, and transformations of chemical constituents of the ocean, and their relation to biological, chemical, geological, and physical processes. Topics include: controls on average concentration of chemicals in the ocean; vertical and horizontal distributions of ocean constituents; air-sea interactions; production, export, and remineralization of organic matter; the ocean carbon cycle; human-induced changes; stable isotopes; and trace elements.

CR: CHEM 2600
PR: CHEM 1011 OR CHEM 1051 which may be taken concurrently OR CHEM 1001

Rationale

The Department of Ocean Sciences requires the introduction of a new course (i.e., Introductory Chemical Oceanography) as one of the five core courses in the new Minor in Oceanography Programme. The Department of Chemistry has agreed to offer this in collaboration with the Department of Ocean Sciences.

Consultations Sought From

Marine Institute
Grenfell campus
Department of Biochemistry
Department of Biology

Comments Received

Yes
No
Yes
Yes
<table>
<thead>
<tr>
<th>Department of Computer Sciences</th>
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<tbody>
<tr>
<td>Department of Economics</td>
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</tr>
<tr>
<td>Department of Geography</td>
<td>No</td>
</tr>
<tr>
<td>Department of Mathematics and Statistics</td>
<td>Yes</td>
</tr>
<tr>
<td>Department of Ocean Sciences</td>
<td>Yes</td>
</tr>
<tr>
<td>Department of Physics and physical Oceanography</td>
<td>No</td>
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<tr>
<td>Department of Psychology</td>
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<tr>
<td>Faculty of Education</td>
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<tr>
<td>Faculty of Arts</td>
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</table>

**Library Report Received**

No

**Signature:** Dean, Associate Vice-President (Academic) or Vice-President

**Name**

---

**FOR OFFICE USE ONLY**

APPROVAL GRANTED BY SENATE COMMITTEE ON UNDERGRADUATE STUDIES

**Chair:**

**Secretary:**

**Date:**

**Consultation email:**

-----Original Message-----
From: Chris Flinn [mailto:cgflinn@mun.ca]
Sent: December-18-13 2:06 PM
To: miconsultations@mi.mun.ca; vpoffice@grenfell.mun.ca; morrisk@mun.ca; pdavis@mun.ca; malsbury@play.psych.mun.ca; hjohnson@mun.ca; Fletcher, Garth, fletcher@mun.ca; bdeyoung@mun.ca; banzhaf@mun.ca; jhanchar@mun.ca; Arts, arts@mun.ca; EducationUndergrad Student Services, muneduc@mun.ca; ekalcock@mun.ca

Subject: Consultations: New course proposal Chemistry 2600/OSC 2200

Hello everyone,

I am asking your feedback on a new course Chem 2600/OSC 2200
Introductory Chemical Oceanography which is to be included in the proposed new minor in Oceanography.

sincerely,

Chris Flinn
Deputy Head, Undergraduate Studies
MUN Chemistry Department

Response from the department of Mathematics and Statistics:

Hi Chris:

The Department of Mathematics and Statistics has no objection to this proposal.

Harold Johnson

Response from the Department of Biochemistry:

Looks like a nice course. No impact on Biochem.

Quoting Chris Flinn <cgflinn@mun.ca>:

Hello everyone,

I am asking your feedback on a new course Chem 2600/OSC 2200 Introductory Chemical Oceanography which is to be included in the proposed new minor in Oceanography.

sincerely,

Chris Flinn
Deputy Head, Undergraduate Studies
MUN Chemistry Department

Philip J. Davis, Ph.D.
Professor and Acting Head
Department of Biochemistry
Memorial University
St. John's, NL
A1B 3X9
(709) 864-8529

Response from the Biology Department

Hi Chris,

The Biology Undergraduate Studies Committee reviewed the new course proposal for the cross listed CHEM 2600/OCSC 2200 at our meeting held Jan. 22nd. The only concern that was
raised has to do with the co-requisites and prerequisites. The prerequisites are first year Chemistry either 1010 & 1011 OR 1050 & 1051 OR 1200 & 1001 but then only one that can be used as co requisite. Chem 1050 should the co requisites include 1011 and 1001?

Thanks
Karen

Karen Morris
Undergraduate Officer
Dept. of Biology
Memorial University of Newfoundland
St. John’s, NL A1B 3X9
709-864-8021

Response from Department of Ocean Sciences:

Hi Chris: I have reviewed the proposal and think it is an excellent second year course for undergraduate students interested in Oceanography and/or taking the proposed Oceanography Minor.

Best regards

Garth

Response from the Marine Institute

Chris,

Thank you for the opportunity to review the proposal for the new cross-listed course Chem 2600/OSC 2200 Introductory Chemical Oceanography. This course will have no impact on programs at the Marine Institute.

We are happy to support this proposal as presented.

Derek Howse
Derek
Chair, Undergraduate Studies Committee
Marine Institute, Memorial University
TEL: 709-778-0586
FAX: 709-778-0394
Derek.Howse@mi.mun.ca
10 February 2014

To: Garth Fletcher  Department of Ocean Sciences

From: Erin Alcock,  Science Research Liaison Librarian

Subject: New Course Proposal, OCSC 2200/CHEM 2600

I have reviewed the new course proposal for OCSC2200/CHEM 2600 – Introductory Chemical Oceanography, and have determined that the Memorial University Library system has sufficient resources to support the course objectives.

The summary of library holdings below indicates numerous monograph titles in this subject area, held mostly in the Queen Elizabeth II Library with some resources at the C.R. Barrett Library. There is more than sufficient coverage to the journal literature from article indexes. Any additional resources required could be purchased under allocations for biology, chemistry and physics and physical oceanography. The major journals in this area are well covered.
Library Holdings Summary

Table One: General Course Subject Themes

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<thead>
<tr>
<th>Course Topic</th>
<th>LCSH</th>
<th>Keywords</th>
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</thead>
<tbody>
<tr>
<td>Chem$ AND Ocean$</td>
<td>245</td>
<td>676</td>
</tr>
<tr>
<td>Chem$ AND seawater</td>
<td>43</td>
<td>135</td>
</tr>
<tr>
<td>Ocean$ AND element$</td>
<td>12</td>
<td>290</td>
</tr>
<tr>
<td>Ocean$ AND compound$</td>
<td>5</td>
<td>70</td>
</tr>
</tbody>
</table>

*as of date of memo

Table Two: Selected Article Indexes and Databases

<table>
<thead>
<tr>
<th>Article Indexes and Databases</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASFA: Aquatic Science and Fisheries Abstracts</td>
</tr>
<tr>
<td>Biological Abstracts</td>
</tr>
<tr>
<td>CAB Abstracts</td>
</tr>
<tr>
<td>SciFinder</td>
</tr>
<tr>
<td>Scopus</td>
</tr>
<tr>
<td>Web of Science</td>
</tr>
</tbody>
</table>
Hello Gail,

The changes have 5 votes in favour (T Andrews, M Gong, I Fleming G Bodwell and myself). None against.
The motion should be tabled in the Faculty Council.

-j

On 02/04/2014 02:46 PM, Kenny, Gail wrote:
> Hi JC,
> 
> And this one as well. Have there been enough responses to indicate it has been approved? Thank you.
> 
> Gail
> 
> >>>Original Message-----
> > From: JC Loredo-Osti [mailto:jcloredoosti@mun.ca]
> > Sent: January-23-14 12:29 PM
> > To: Craig Purchase; Fleming, Ian; Graham Bodwell; Paul Sylvester; JC Loredo-Osti; Todd Andrews; Kenny, Gail; Sukhinder Kaur Cheema; Len Zedel; Brent Snook; Bell, Trevor; Amrutha Paladugu; Minglun Gong
> > Subject: Fwd: RE: FW: proposed calendar change - Ocean Sci / Marine Biol grad program
> > Dear all,
> > only two of you have respond to this proposed calendar changes. I think they are only housekeeping changes. Is there something else that I oversaw? Please, let me know your decision -j
> > 
> > 
> > ------ Original Message ------
> > Subject: RE: FW: proposed calendar change - Ocean Sci / Marine Biol grad program
> > Date: Thu, 23 Jan 2014 12:03:00 -0330
> > From: Kenny, Gail <gkenny@mun.ca>
> > To: JC Loredo-Osti <jcloredoosti@mun.ca>
> > 
> > Hi JC,
> Did this get through the committee yet? Ian Fleming from OSC is
> checking on it and hoping to have this through sooner rather than later. Thanks.
>
> Gail
>
> From: JC Loredo-Osti [mailto:jloredooosti@mun.ca]
> Sent: December-17-13 1:36 PM
> To: Craig Purchase; Fleming, Ian; Graham Bodwell; Paul Sylvester; JC
> Loredo-Osti; Todd Andrews; Kenny, Gail; Sukhinder Kaur Cheema; Len
> Zedel; Brent Snook; Bell, Trevor; Amrutha Paladugu; Minglun Gong
> Subject: Fwd: FW: proposed calendar change - Ocean Sci / Marine Biol
> grad program
>
> Dear all,
>
> for your approval, the attached housekeeping changes to the calendar
> from Ocean Sci/Marine Biol.
> Please, let me know to your earliest convenience, -j
>
>
> --
> JC Loredo-Osti, Associate professor
> Department of Mathematics and Statistics Memorial University
> Phone: +(709) 864 8729

"Alas! all music jars when the soul's out of tune"
   --Miguel de Cervantes
24.18 Marine Biology

- **Professor Emeritus and Head of the Department**
  - G.L. Fletcher

  The degree of Master of Science (M.Sc.) is offered in Marine Biology by full-time and part-time study through the Department of Ocean Sciences. Areas of concentration include: Ocean Ecology, Functional Biology of Marine Organisms, Fisheries and Aquaculture, and Oceans and Environment.

### 24.18.1 Admission and Program of Study

1. Admission into the Master’s degree program in Marine Biology is normally restricted to candidates holding at least a B.Sc. degree with second class Honours. When circumstances warrant, the requirement for a second class Honours may be waived by the School of Graduate Studies on the recommendation of the Head of the Department.

2. Each candidate will be assigned a Supervisory Committee consisting of the Supervisor and at least one other member. Within one-three months of the first registration in the M.Sc. degree program, a candidate will meet with his/her Supervisory Committee. Within six months, the student and the Supervisory Committee will agree on a written thesis proposal outlining the objectives, methods, timetables, and funding for the project, and provide the proposal (signed by the student and the supervisory committee) to the Head for inclusion in the student's file.

3. Candidates are required to complete a minimum of 12-9 credit hours of graduate program courses as follows:
   - Ocean Sciences 7000
   - One of Ocean Sciences 7531-7100 or 7561-7200
   - 6-3 additional credit hours selected from other Ocean Sciences graduate courses or relevant courses in other Departments as approved by the Supervisory Committee

   All course requirements should be completed within four semesters from the date of first registration in the M.Sc. degree program.

   A candidate is required to give an oral presentation to the Department on the results of his/her research. This presentation should be given during the second year of the program after completion of a thesis draft.

   The M.Sc. degree program will conclude with a thesis examination as prescribed in the School of Graduate Studies **General Regulations, Theses and Reports**.

### 24.18.2 Courses

A selection of the following graduate courses will be offered to meet the requirements of candidates, as far as the resources of the Department will allow:

- OCSC 7000 Graduate Core Seminar (Cross-listed as Biology 7000)
- OCSC 7531-7100 Biological Oceanography (Same as the former Biology/OCSC 7531)
- OCSC 7200 Adaptations to the Marine Environment (Same as the former Biology/OCSC 7561)
- OCSC 7540-7300 Plankton Dynamics (Same as the former Biology/OCSC 7540)
- OCSC 7551-7400 Fisheries Resource Management (Same as the former Biology/OCSC 7551)
- OCSC 7561 Physiology of Marine Vertebrates (Same as the former Biology 7561)
30.24 Marine Biology

- **Professor Emeritus and Head of the Department**
  - G.L. Fletcher

The Degree or Doctor of Philosophy (Ph.D.) is offered in Marine Biology by full-time and part-time study through the Department of Ocean Sciences. Areas of concentration include: Ocean Ecology, Functional Biology of Marine Organisms, Fisheries and Aquaculture, and Oceans and Environment.

### 30.24.1 Admission and Program of Study

1. Admission into the Ph.D. program in Marine Biology is normally restricted to candidates holding a Master’s Degree or its equivalent. In exceptional circumstances, a candidate with a B.Sc. (Honours) Degree who has spent not less than 12 months in an M.Sc. Degree program may be recommended for transfer into a Ph.D. program, provided that the candidate can demonstrate, to the satisfaction of the Department of Ocean Sciences, his/her ability to pursue research at the doctoral level.

2. Each candidate will be assigned a Supervisory Committee consisting of the Supervisor and at least one other member. Within one-three months of the first registration in the Ph.D. degree program, a candidate will meet with his/her Supervisory Committee. Within six-nine months, the student and the Supervisory Committee will agree on a written thesis proposal outlining the objectives, methods, timetable and funding for the project, and provide the proposal (signed by the student and the supervisory committee) to the Head for inclusion in the student’s file.

3. Candidates are normally required to complete a minimum of 9-6 credit hours of graduate program courses as follows:
   - Ocean Sciences 7000
   - One of Ocean Sciences 7531-7100 or 7561-7200
   - Ocean Sciences 7000, 3 additional credit hours selected from other Ocean Sciences graduate courses or relevant courses in other Departments as approved by the Supervisory Committee

All course requirement should be completed within five semesters from the date of first registration in the Ph.D. program.

**Normally Upon completion of required course work the candidate shall undertake a mandatory comprehensive examination, following the General Regulations, Comprehensive Examinations, Ph.D. and Psy.D. Comprehensive Examination.** The comprehensive examination will be both written and oral. Students should consult the Departmental guidelines for further information and a detailed description of the content of the Comprehensive Examination.

The Ph.D. program will conclude with the examination and oral defense of the completed thesis in accordance with the School of Graduate Studies General Regulations, Theses and Reports.

### 30.24.2 Courses

A selection of the following graduate courses will be offered to meet the requirements of candidates, as far as the resources of the Department will allow:

- OCSC 7000 Graduate Core Seminar (*Cross-listed as Biology 7000*)
- OCSC 7531-7100 Biological Oceanography (*Same as the former Biology/OCSC 7531*)
- OCSC 7200 Adaptations to the Marine Environment (*Same as the former Biology/OCSC 7561*)
- OCSC 7540-7300 Plankton Dynamics (*Same as the former Biology/OCSC 7540*)
- OCSC 7551-7400 Fisheries Resource Management (*Same as the former Biology/OCSC 7551*)
- OCSC 7561 Physiology of Marine Vertebrates (*Same as the former Biology 7561*)
Hello Gail,

this course has been approved (although a number has to be assigned before the Faculty Council is informed of its approval).

The request has seven voters in favour (M Gong, L Zedel, T Andrews, G Bodwell, C Purshase, T Bell and myself). None against.

-j

On 02/04/2014 02:45 PM, Kenny, Gail wrote:
> Hi JC,
> 
> Has this received enough votes to say it has been approved? Thanks.
>
> Gail
>
> From: MathStat Graduate Officer [mailto:mathgrad@mun.ca]
> Sent: January-28-14 10:54 AM
> To: Craig Purchase; Fleming, Ian; Graham Bodwell; Paul Sylvester; JC
> Loredo-Osti; Todd Andrews; Kenny, Gail; Sukhinder Kaur Cheema; Len
> Zedel; Brent Snook; Bell, Trevor; Amrutha Paladinu; Minglun Gong
> Subject: Fwd: Special Topics - ENVS 6204
>
> Dear All,
>
> attached is the request for authorization of a special topics course
> to be offered as directed readings.
> Please review and let me know your opinion at your earliest convenience.
> -j
> 
> 
> 

1
Request for Approval of a Graduate Course

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) Fill in the required data and save the file; (5) Submit the completed form to:

School of Graduate Studies; Memorial University of Newfoundland; IIC-2012 (Bruneau Centre for Research and Innovation); St. John’s, NL A1C 5S7 Canada  Fax: 709.864.4702  eMail: sgs@mun.ca

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

Course No.: ENVS 6204
Course Title: Forest Sector Transformation

1. To be completed for all requests:

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

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: No compensation is required for this course

D. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   This self-directed reading course examines the evolution and dynamics of the forest industry. The objective of the course is to expose the students to more in depth discussions and critical thinking about the trends, challenges, and complex landscape of the forest sector. The focus will be on transformation of the sector and the role of innovation in advancing the industry. The role and policies of universities (e.g. research) in advancing the sector will be examined. Syllabus Attached

G. Method of evaluation:

<table>
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<th></th>
<th>Written</th>
<th>Percentage</th>
<th>Oral</th>
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<tr>
<td>Assignments</td>
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<tr>
<td>Other (specify):</td>
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<td></td>
</tr>
<tr>
<td>Topic Synopses</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Final examination:</td>
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</tr>
<tr>
<td>Total</td>
<td>90</td>
<td>10</td>
<td></td>
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</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Instructor's Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.B.</td>
</tr>
</tbody>
</table>

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

2014

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

Wade Bowers

Course instructor

[Signature]

Approval of the head of the academic unit

Jan 19, 2013

Date

20/01/14

Date

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

Secretary, Faculty/School/Council

Date

Updated October 2011
SPECIAL TOPICS - SPECIAL TOPICS IN ENVIRONMENTAL SCIENCE 6204

"A master can tell you what he expects of you. A teacher, though, awakens your own expectations."

Instructor: Bowers, Wade
Office: Fortis Building, 6th Floor
Telephone: 709.637.2339
Email: wadebowers@gov.nl.ca

Course Schedule: As mutually agreed.
Classroom: Study Room, Grenfell
Office Hours: As mutually agreed.

COURSE DESCRIPTION

This self-directed reading course examines the evolution and dynamics of the forest industry. The objective of the course is to expose the students to more in depth discussions and critical thinking about the trends, challenges, and complex landscape of the forest sector. The focus will be on transformation of the sector and the role of innovation in advancing the industry. The role and policies of universities (e.g. research) in developing and transferring technological developments in support of the industry will be examined.

EVALUATION

Research Paper 1 30% Due: Feb 15, 2014
Research Paper 2 30% Due: Mar 15, 2014
Assigned Readings (3) - synopsis 30% Due: (Jan 31, Feb 28, Mar 31)
Discussion based on readings 10%

This is an independent study course. Therefore, the student is expected to work without direct supervision and take the initiative to contact the instructor when required.

Research Paper

The candidate will complete two major research papers and 3 assigned readings; each reading will be examined through a 2 page synopsis (written and oral) followed by a discussion with the instructor. Assigned readings are designed to develop an understanding of current trends in forest-related research, innovation and to ensure the student receives an interdisciplinary experience. The topics have been agreed to by the instructor and the student and are listed below. The approximate lengths are suggested as a guide.

Research Paper 1: Examine the Role of Innovation in the Forest Products Industry. The paper will review the forest value chain with a particular emphasis on downstream product develop. What is the potential for new and innovative products within the sector? (~15 pages)

Research Paper 2: Review forest industry clustering efforts and how they can act as a core of innovative development. To what extent have clustering efforts been a driver of innovation in the forest industry? (~20 pages)
Reading Assignment 1:

Reading Assignment 2:

Reading Assignment 3:
Strategic Plan for the Faculty of Science

Memorial University of Newfoundland
Fall 2011

The province of Newfoundland and Labrador, and Memorial University are currently undergoing a period of rapid change. As the province's role within the country has changed, so too has the role of Memorial University and the Faculty of Science. The purpose of this document is to anticipate and plan for research, teaching, and service in this environment and to provide guidance to the Faculty of Science for the next decade.

Anticipated Challenges for the Faculty of Science from 2011 to 2021

- Memorial University will continue to shift its focus to become a more research-intensive university.
- Tri-council (NSERC, CIHR, SSHRC) funding will continue to be a basic operating resource for many faculty members. However, competition for these sources will only increase in the future. While tri-council funding will be fundamental to the research mission of the Faculty of Science, other agencies such as The Atlantic Canada Opportunities Agency, the Atlantic Innovation Fund, Canada Foundation for Innovation, Genome Canada, Genome Atlantic and the Newfoundland and Labrador Research and Development Council will continue to provide the financial resources that will allow us to significantly transform research. For the Faculty of Science to thrive in the next decade, we must pre-position ourselves to take full advantage of these and other opportunities.
- Graduate student numbers will continue to increase.
- Undergraduate student numbers will remain stable or increase modestly. This student population will become more ethnically diverse. Engagement of faculty in undergraduate recruitment activities will need to be increased.
- The numbers of students registering for distance education courses will continue to increase. With this growth, we will need to reconsider the blend of on-campus and distance courses acceptable for a MUN degree, and the extent to which the Faculty of Science should be offering courses to other institutions and accepting courses from other institutions.
- We will continue to be challenged by our infrastructure, but a revitalized provincial economy means that it is reasonable to assume that significant new construction will take place within the next 10 years.
- The Faculty of Science has not fully engaged its alumni. They are a critical resource for this Faculty so establishing this connection will be a major new undertaking.

Vision

A research-intensive Faculty that is renowned both for the caliber of our research and the quality of our graduates
Mission

Consistent with the mission of Memorial University, the Faculty of Science is dedicated to international excellence in research, teaching and engagement to the benefit of people locally, nationally, and internationally.

Mandate

Research

The Faculty of Science is responsible for the provision of a broad spectrum of basic science knowledge and as such serves as the foundation upon which more applied disciplines are based. It is our responsibility to further knowledge within specific science disciplines, as well as to create the conditions that facilitate interdisciplinary research.

Teaching

The Faculty of Science is intended to be broadly accessible to students. Emphasis is placed on creating an environment that encourages and supports the learning process, while also challenging our students to achieve goals they might not have thought possible.

The Plan

Research Goals:

The Faculty of Science will enhance its stature globally as a leading research-intensive faculty that advances knowledge and produces high calibre graduates. Research within the Faculty of Science is primarily devoted to questions of fundamental importance, but also includes applied research relevant locally, nationally, and internationally. To achieve this we will:

1. Support and promote basic and applied research excellence in areas of established strength and emerging opportunity while recognizing the freedom of the faculty to pursue individual research interests based on their judgement, skill, and curiosity. The hiring of faculty will be primarily driven by our research agenda.
2. Attract and retain world-class faculty, students, postdoctoral fellows and staff to engage in cutting edge research activity.
3. Foster an intellectual environment conducive to research excellence and to the training and mentoring of highly qualified personnel.
4. Provide the infrastructure and services essential to support the training of undergraduate and graduate students and leading-edge research.
5. Engage with partners within and outside of Memorial to promote and support interdisciplinary research, research networking, and research collaborations.
6. Promote the high caliber of our research. This can be achieved by more aggressively preparing and nominating our faculty and graduate students for national and international awards.
Current Strengths and Emerging Opportunities in Research

The Faculty of Science currently has substantial and diverse research strength, the greatest being our faculty, staff, and students. Within academic departments research agendas are driven by the discipline-specific departmental strategic plans. Beyond those, the Faculty of Science engages in interdisciplinary research that crosses individual departments and serves to synergize the research endeavor in the Faculty as a whole. The current research strengths include Marine Sciences; Natural Resources; Biomedical Sciences and Health; Materials Science; and Mathematical and Computational Sciences.

While the Faculty of Science is committed to maintaining its core areas, there are also particular areas of emerging opportunity generated by the expertise of our faculty, our research infrastructure, and our geographical position with its associated climate, resources, and ecology that distinguish us from other faculties of Science. We therefore provide diverse opportunities that will draw researchers and students here in preference to other universities in Canada or internationally. The areas also crosscut most of the departments and are consistent with the priority and strategic areas that federal and provincial government agencies target for funding as well as Memorial’s special obligation to the people of Newfoundland and Labrador. They also reflect areas in which we have made recent new hires. For the Faculty of Science, these strategic research areas are:

Marine Sciences

Research activities in this area includes, for example: biological, chemical, physical, and geological oceanography and oceanographic modeling; ocean acoustics; ocean data visualization; ocean sensor and instrumentation development; physiology, molecular biology, and biochemistry of aquatic species; aquaculture and fisheries science; marine ecology; cognitive and behavioural ecology of marine species; conservation and climate change; glacial climate systems; harsh environments.

Natural Resources and Energy

Research activities in this area include the discovery, production and monitoring of non-renewable and renewable natural resources as well as traditional and alternative sources of energy. Some examples are: petroleum reservoir characterization and modeling; mineralogy; stratigraphy; sedimentology; exploration geophysics; tectonics; environmental impact and monitoring of resource extraction; biofuels and materials; energy sustainability, cognitive and behavioural ecology; landscape ecology and conservation; plant ecology; environmental geology; sustainable/green chemistry; alternative energy sources; geochemistry; biogeochemistry; contaminant hydrology; environmental chemistry.

Teaching Goals:

The Faculty of Science is dedicated to providing our undergraduate and graduate students with the best possible educational experience, acknowledging the needs and interests of our province.
1. All decisions involving the education of our students will be designed to uphold the value of a Memorial University Science degree.

2. Students will be provided with the highest quality of instruction. To ensure this, faculty members will receive constructive feedback, and be provided with the opportunity and the means to improve and enhance their teaching and to develop innovations in teaching. Graduate students will have opportunities for developing their teaching skills.

3. We will maintain an infrastructure appropriate for contemporary learning. Undergraduate laboratory equipment will have technology consistent with that used in the modern research environment.

4. Undergraduate students will be involved in the research environment. Our undergraduates will be given the opportunity to participate in research and such experience should be credited on their transcripts. Undergraduate students will be encouraged to present their research findings at regional and national scholarly conferences.

5. We will incorporate technological advancements into our curricula whenever it is appropriate to do so. In particular, an increase in the scope of distance course offerings here and elsewhere will create challenges and opportunities.

6. Teaching excellence will be recognized and rewarded by actively nominating faculty for local and national teaching awards.

Current Strengths and Emerging Opportunities in Teaching

The Faculty of Science has a strong reputation of excellence in teaching that is a consequence of the skill and dedication of our faculty and staff. Our instruction ranges from the traditional lecture format, to learning opportunities that place greater emphasis on experiential learning (e.g., field schools and courses and clinical training), to award winning distance education courses. While the Faculty of Science includes a diverse range of disciplines, we are committed to providing students with both the opportunity to learn and the opportunity to apply their knowledge. Coop programs are a relatively small component of our programs within the Faculty of Science, and they provide a learning opportunity that should grow in the future. Likewise, there are also opportunities for expanding the range of options for our students through partnerships with other faculties (e.g., life science and engineering science).

Priorities for most of our undergraduate and graduate programs are provided by our departmental strategic plans. The Faculty of Science is home to our interdisciplinary graduate programs (Aquaculture, Cognitive and Behavioural Ecology, Computational Science, Environmental Science, and Theoretical Physics). As our graduate programs reflect our research expertise, we expect growth in our graduate programs to be fueled by growth in our research programs.

Engagement:

As one of the largest academic units at Memorial University, we tend to be modest about our achievements. However, such modesty means that most outside the Faculty of Science do not know who we are, what we do, and how we contribute to both the university and the province. We therefore do not get the recognition we deserve in terms of the excellence of our teaching programs, and the accomplishments of our students, faculty and staff.
1. We will better engage with the community to make clear our contribution to society and our contribution to the success of the province.
2. We will make a strong connection with our alumni so that they remain engaged with the Faculty of Science after they graduate.
3. The Faculty of Science at Memorial will establish a national profile that distinguishes it from science at other universities in Canada. This will be informed by our research and teaching goals.
4. We will be proactive in our use of technology in order to have a presence in a variety of different media.
5. Our faculty are encouraged to be more engaged with the media and they will be assisted with media training.
6. Students will be encouraged to participate in national and international competitions to both inform ourselves and others of the strengths of our programs.
MEMORIAL UNIVERSITY OF NEWFOUNDLAND
FACULTY OF SCIENCE

Faculty of Science Awards Committee

Committee Purpose

To foster a culture within the Faculty of Science where excellence in research and teaching are valued and recognized. To assist in increasing the number of Science faculty members recognized by awards at the University, national and international levels.

Membership in the Committee

The Selection Committee shall be appointed by the Dean of Science, and shall consist of at least three faculty members from different disciplines within the Faculty. Members will be appointed for staggered three-year terms, to ensure continuity. Furthermore, committee membership will be taken from successively different departments while maintaining a balance of representation from the general areas of life sciences, physical sciences and formal sciences. The Committee shall elect its own Chair from among its members, and shall establish its own procedures.

Activities

- Review nominations and make selections for Faculty awards including the Dean of Science Distinguished Scholar Medal and the Dean of Science Distinguished Teaching Award.
- Identify appropriate internal and external awards for research and teaching.
- Develop a process to identify faculty members who should be nominated for particular awards.
- Provide assistance in the preparation and submission of the award applications.
- Communicate regularly with the Associate Dean (Administration and Undergraduate) and Associate Dean (Research) on the activities of the Committee.