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, January 21, 2015, at 1 p.m. in C-2045.

AGENDA

1. Regrets
2. Adoption of the Minutes of December 17, 2014
3. Business Arising from the Minutes
4. Correspondence:
   a. Notification received that Paul Snelgrove will replace Ian Fleming as the Department of Ocean Sciences’ representative on the Faculty of Science Graduate Studies Committee effective January 2015.
   b. Notification received that Rob Nolan, Office of the Registrar, will be the Registrar’s representative for the Faculty of Science Academic Council effective January 2015.
5. Reports of Standing Committees:
   A. Undergraduate Studies Committees:
      a. Faculty of Science, calendar change, deletion of Science 5998, Exchange Programs in Science, paper 5.A.a (8 pages).
      b. Response to Senate Committee on Undergraduate Studies, Changes to General Academic Regulations 6.6 EVALUATION and 6.7 EXAMINATIONS, paper 5.A.b (1 page). Approved by the Undergraduate Studies Committee of the Faculty of Science Faculty Council and included for information only.
   B. Graduate Studies Committee:
      a. Interdisciplinary Programs, Scientific Computing, calendar changes, paper 5.B.a (8 pages).
      b. Department of Computer Science, calendar changes, paper 5.B.b (59 pages).
   C. Nominating Committee: None
   D. Library Committee: None
6. Reports of Delegates from Other Councils
7. Report of the Dean
8. Question Period
9. Adjournment

Mark Abrahams
Dean of Science
FACULTY OF SCIENCE
FACULTY COUNCIL OF SCIENCE
MINUTES OF MEETING OF DECEMBER 17, 2014

A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, December 17, 2014, at 1:00 p.m. in room C-2004.

FSC 2300

Present
Biochemistry
Booth, V. Cheema, S. Mulligan, M.

Biology
Innes, D.

Chemistry
Bottaro, C. Fridgen, T. Pickup, P.

Computer Science
Banzhaf, W.

Earth Sciences
Hanchar, J.

Mathematics & Statistics
Haynes, R. Mantyka, S. Sullivan, S.

Ocean Sciences
Fletcher, G.

Physics & Physical Oceanography
Morrow, M.

Psychology
Malsbury, C. Thorpe, C.

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

DELTS
Todd, A.
Education
Penney, S.

Registrar's Office
Burry, J.

FSC 2301 Regrets: None

FSC 2302 Adoption of Minutes
Moved: Minutes of the November 19, 2014, meeting be adopted as amended. (Sullivan/Pickup). Carried.

FSC 2303 Business Arising: None

FSC 2304 Correspondence: None

FSC 2305 Reports of Standing Committees:
Report presented by Shannon Sullivan, Chair, Undergraduate Studies Committee. It was noted that the deadline for submitting calendar changes to the Registrar's Office was yesterday, December 16, 2014, but that permission had been granted to submit changes from the Faculty of Science Faculty Council today, December 17, 2014. Departments are reminded to submit their electronic copies as soon as possible. Also noted was the fact that the Faculty of Arts is changing their requirement for students to complete two English courses. Members of the Faculty of Science Undergraduate Studies Committee have been asked to seek feedback from their departments about changing this requirement in the Faculty of Science as well. Faculty members are asked to participate in the consultation.

A. Undergraduate Studies Committee:
   a. Moved: Department of Chemistry, revisions to Computation Chemistry major and honours major programs (Sullivan/Pickup). Carried.
   b. Moved: Department of Computer Science, calendar change, COMP 1600, Basic Computing and Information Technology (Sullivan/Banzhaf). Carried.
   c. Moved: Department of Biochemistry, calendar changes to first-year Physics requirements in existing Biochemistry programs (Sullivan/Mulligan). Carried.
e. **Moved**: Department of Mathematics and Statistics, calendar changes, MATH 3132, Numerical Analysis I, and MATH 3161, Ordinary Differential Equations II (Sullivan/Haynes). **Carried.**

f. **Moved**: Department of Biology, new course, BIOL 3820, Foundations of Biology (Sullivan/Innes). **Carried.**

g. **Moved**: Department of Earth Science, new course, EASC 4405, Field Course on the Geology of Newfoundland (Sullivan/Hanchar). **Carried.**

h. **Moved**: Department of Earth Science, new course, EASC 4620, Contaminant Hydrogeology (Sullivan/Hanchar). **Carried.** (Note: page 13 of this proposal was inserted in error; this page should have been included in paper A. j. below (as page 5 of 11).

i. **Moved**: Department of Earth Sciences, calendar changes, EASC 4610, Hydrogeology (Sullivan/Hanchar). **Carried.**

j. **Moved**: Department of Earth Sciences, calendar changes, general and honours B.Sc. degrees (Sullivan/Hanchar). Page 5 of this proposal (calendar change outlining 9.5.5 and 9.5.6) inserted in paper A. h above (as page 13 of 19) in error. **Carried.**

k. **Moved**: Department of Earth Sciences, calendar changes, course numbering (Sullivan/Hanchar). **Carried.**

l. **Moved**: Department of Chemistry, calendar changes, first year courses (Sullivan/Pickup). **Carried.**

m. **Moved**: Department of Mathematics and Statistics, calendar changes, degree regulations (Sullivan/Haynes). **Carried.**

n. **Moved**: Department of Mathematics and Statistics, calendar changes, MATH 102F, 102N, 103F, 104F (Sullivan/Mantyka). **Carried.**

o. **Moved**: Department of Mathematics and Statistics, calendar changes, MATH 2000, Calculus III (Sullivan/Haynes). **Carried.**

p. **Moved**: Department of Psychology, new courses, PSYC 2930 (Sullivan/Malsbury). Request was received from the Faculty of Arts to amend the calendar description. **Carried.** PSYC 3820 (Sullivan/Martin). **Carried.** PSYC 3830 (Sullivan/Martin). **Carried.** PSYC 3510 and PSYC 3511 (Sullivan/Martin). **Carried.** Amended papers attached.

q. **Moved**: Department of Psychology, calendar changes, existing courses (Sullivan/Martin). **Carried.**

r. **Moved**: Department of Psychology, calendar changes, Psychology and Behavioural Neuroscience degree programs (Sullivan/Martin). **Carried.** Request was received from the Faculty of Arts to amend the calendar description. Amended papers attached.

B. **Graduate Studies Committee:**
Report presented by Christina Bottaro, Member, Graduate Studies Committee and Len Zedel, Associate Dean (Graduate and Research).
a. **Moved:** Department of Chemistry, calendar changes, graduate programs (Bottaro/Pickup). **Carried.**

b. SafetyNet Centre for Occupational Health and Safety Research, graduate program proposal, Master in Occupational Health and Safety. Included for information only. Discussed by Faculty Council and received a positive response.

C. **Nominating Committee:** None

D. **Library Committee:** None

**FSC 2306**

**Reports of Delegates from Other Councils**
Amy Todd, DELTS representative, informed Council of the preparations for the Teaching and Learning Chair positions and urged departments to submit proposals. The deadline for proposals is mid-February. Also, Doreen Whelan and Albert Johnson will be offering sessions in the new year to assist departments with preparing submissions.

Faculty are reminded to activate their D2L shells for the winter semester especially in light of the problems with power outages experienced last winter.

**FSC 2307**

**Proposed Modification to Science Strategic Plan**
The proposed modification to the strategic plan has not yet been approved by Department Heads so the motion will be tabled until the new year. Faculty Council was reminded that the strategic plan will be reviewed yearly and members should consider modifications they would like discussed.

**FSC 2308**

**Report of the Dean**
Presented by Mark Abrahams, Dean

The Dean would like to congratulate Devin Grant from the Department of Mathematics and Statistics for being awarded the Rhodes Scholarship this year. It is a remarkable accomplishment and worth noting that students from the Department of Mathematics and Statistics have been remarkably successful in this competition.

Work on the Core Sciences Facility is progressing well, and the project met its milestone of completing the 30% Design and Development Phase with associated cost projections provided to the government. Work is progressing towards the 60% phase to be completed by mid-January which will facilitate tendering of the first contracts this Spring with construction to begin around May. To this end, a Project Management Firm has now been selected that will oversee construction.

The Dean reminded everyone that proposals are being sought through the Teaching and Learning Framework. Proposals may be submitted for teaching chairs, but funding for other teaching initiatives can be sought through this fund.
The government announced a new program called the Canada First Research Excellence Fund. Each institution is allowed to submit only one application so there is a group of faculty that are developing MUN’s proposal. Timelines are very tight, with the Letter of Intent due early in February and the full proposal due March 2.

FSC 2309  Question Period
The Dean was asked to comment on why a particular project was decided on for the CFREF submission. The university has to show in its proposal how we are a world leader in the chosen area; and in order to do this, senior leadership is leveraging the substantial investments received by the university in the area of cold ocean research. The Dean confirmed that, consistent with the methods used by other universities, expressions of interest were not sought from the university community.

In light of the government's announcement of budgetary shortfall, it was asked whether there would be any ramifications for the new core sciences building. The Dean confirmed that government has given permission for the project to begin and that there are several key government representatives on the project steering committee.

FSC 2310  Adjournment
The meeting adjourned at 1:45 p.m.
Proposal
New Courses

Executive Summary

The Psychology Department proposes to create five new courses.

PSYC 2930, Research and Writing in Psychology: required for PSYC and BHN R major.

PSYC 3820, Research Techniques in Behavioural Neuroscience: required for BHN R major.

PSYC 3830, Behavioural Endocrinology: elective for PSYC and BHN R major.

PSYC 3510/3511, Directed Study: elective for PSYC and BHN R major.

Resource Implications: Instructional Costs

No new costs will be incurred for either instructors or infrastructure. The 5 new courses will be taught by current faculty as part of their regular teaching load. PSYC 2930 will be introduced in the fall of 2015, at the time an existing required course (PSYC 2570) is eliminated. PSYC 3820 will be introduced in the fall of 2016, at the time an existing required course (PSYC 3801) is eliminated. PSYC 3830 will be offered as faculty resources permit. PSYC 3510/3511 will count as part of a faculty member’s teaching credit for supervision. Credit for supervising students in this course follows the existing departmental Teaching Equivalency document: Supervision of a completed report will count as 0.25 of a course. Offering these courses will most likely be neutral with respect to teaching resources required, as faculty members cannot receive more than one course credit per year for supervision. Current faculty who could provide students with research opportunities supervise a great number of honours students and graduate students and are therefore unable to accrue any additional credit for taking on students in the Directed Studies course.

Consultations

Appropriate academic units have been consulted. See email attached.

Library Holdings and/or Other Resources Required

The library has been contacted. Current library holdings are adequate to cover the needs of these new courses. See email attached.

The costs, if any, associated with these changes can be met from within the existing budget allocation or authorized new funding for the Department of Psychology.
Proposal for New Courses

Signature of Unit Head (if appropriate): ________________________________

Date: ________________________________

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

Date: ________________________________
Proposal for New Courses

Sample Course Outline and Method of Evaluation

Psychology 2930 – Research and Writing in Psychology
Fall 2015

Instructor: Christina Thorpe
Office: SN 3069
Phone: 864-4806
Email: cthorpe@mun.ca
Office Hours: TBA or by appointment

Teaching Assistants: There will be 5-7 TAs. These will be announced later.

Schedule: Mondays, Wednesdays and Fridays, TBA

Important note: e-mails will be answered on weekdays during normal working hours. We will try our best to respond as quickly as possible. However, do not expect immediate responses. Please limit e-mail questions to ones that can be answered briefly. For more complex questions, please drop by during office hours or make an appointment to talk to either the instructor or the TA.

Course Summary

This course is designed to ensure all Psychology and Behavioural Neuroscience majors have a strong foundation in the fundamentals of preparing written and oral psychology reports, emphasizing organization, correct use of terminology, adherence to APA style, concise description, preparation of abstracts, integration of numerical data, and oral presentation skills.

Course Requirements

You are responsible for all material discussed in the lectures and the material in the textbook. It is important to come to class, as I will be discussing topics that are not covered in the textbook.


Desire2Learn site: This class will have a D2L site. On this site you will find the following: course materials, course syllabus, grades, announcements. Please do NOT use the D2L site to e-mail me – rather please use the e-mail address given above. To access your D2L website go to the following website (https://online.mun.ca/) and follow the instructions. If you have any problems with this please contact the TA.
Proposal for New Courses

Course Objectives

- Students will be able to write a variety of different psychology reports including mini-reviews, essays, reviews, and research reports/manuscripts.
- Students will practice their oral presentation skills so that they can express what they have learned in a professional manner.
- Students will practice critical reading of published psychology articles (including original research reports and review papers).
- Students will practice editing other students' papers in a professional manner.
- Students will learn to work effectively in groups.

Tentative Topics To Be Covered

- Electronic and library searches for materials (Guest lecture by librarian)
- Ethical research guidelines and Tri-Council policies (Guest lectures by Animal Care Services and ICEHR)
- Common grammatical mistakes
- Plagiarism
- Writing an essay or research paper
- Writing a lab report
- Presentation of data (e.g., how to write Results section in APA format, how to make proper graphs and tables)
- APA style and format
- Oral presentations and seminars
- Professional development issues (guest lectures by Career Planning and Development, Graduate Studies, Honours coordinator, Co-op coordinator). If time allows.

Evaluation

Course grades will be determined on the basis of your performance on written assignments, presentations, quality of peer feedback, and class participation.

The due dates and breakdown of grades is as follows:

For many of the classes students will be broken into three discussion groups, each lead by a TA. In these discussion groups students will discuss research articles both in terms of the material covered and how it is written. This will enable students to see first-hand how research is presented and discover research topics that they might be interested in pursuing further in their undergraduate degree. Participation in these groups will count for 10% of your overall grade in the course.
Proposal for New Courses

**Essay #1**
Students will write a review paper on one of five possible topics. The list of possible topics will be provided on D2L and discussed in class. Students will need to find a minimum of 10 original research articles. The main body of the paper (i.e., not including cover page, abstract and references) will be 5-6 pages double-spaced.

*Draft 1 (2%)* is due September 21 at noon. This draft will be graded by 5 of your peers. The lowest and highest grade will be removed and your mark will be based on the average of the middle three grades.

*Feedback of Draft 1* is due September 25 at noon. You will be expected to grade the papers of five of your classmates. You are expected to provide constructive feedback on APA formatting, grammar, organization, and overall quality of the paper.

*Draft 2 (13%)* is due September 30 at noon. You are expected to improve upon your draft by incorporating the feedback of your peers and observations that you made based on grading your peers. This version will be marked by two of your TAs. You grade will be based on the average of their marks.

**Essay #2**
Students will be able to choose a topic on their own to write about. However, you are encouraged to discuss the topic with the TA and/or prof. Again, the paper will be 5-6 pages double-spaced.

*Draft 1 (8%)* is due October 7 at noon. It will be graded by one TA.

*Draft 2 (12%)* is due October 19 at noon. This draft will be graded by the professor.

**Research Report #1**
This research report will be based upon an experiment/study that we do in class. You will be expected to write a complete lab report (i.e., Cover page, Abstract, Introduction, Methods, Results, Conclusions, References, Figures and/or Tables).

*Draft 1 (2%)* will be graded by your peers. It is due October 26 at noon.

*Feedback of Draft 1* is due October 30 at noon.

*Draft 2 (13%)* is due November 6 at noon. It will be graded by two of your TAs.

**Research Report #2**
This research report will be based upon an experiment/study that we do in class. You will be expected to write a complete lab report (i.e., Cover page, Abstract, Introduction, Methods, Results, Conclusions, References, Figures and/or Tables).

*Draft 1 (8%)* will be graded by one of your TAs. It is due November 13 at noon.
Proposal for New Courses

Draft 2 (12%) is due November 25 at noon. It will be graded by the professor.

Presentation (10%)
Students will be expected to give a 5 minute presentation to their Discussion group summarizing a paper that they read. Students must e-mail a pdf of the paper to the TA and professor at least one week prior to their scheduled presentation day. The dates for the presentations will be November 20, 23, 25 and 27. The TA leading your discussion group will grade the presentations.

Quality of Peer Feedback will count for 5% of the overall grade. This will be graded by the professor.

Chapter Summaries
Students will also be required to write 5 mini-papers or summaries of the chapters in the textbook. These papers will be a maximum of 1 double-spaced page and will be marked as pass or fail. Each paper “passed” will count as 1 mark towards their final grade.

General points about assignment:
- It is important that students work independently on these papers. Consequences for plagiarism are severe at Memorial University of Newfoundland (See Section 5.11.4 Academic Offences of the University Calendar).
- Assignments must be completed in Microsoft Word. We will be using the track changes function. If you do not have Word on your personal computer, you may use the computers in the Psychology lab (or any of the labs on campus).
- You will submit your papers to both the instructor and the TA using the dropbox feature of D2L.
- Because of the feedback nature of this assignment, strict penalties will be in place for late submissions. Late assignments will be deducted 10% for every day that they are late.

Additional Points
- All students are encouraged to note the current MUN Calendar concerning drop and add dates, general undergraduate regulations and academic offences. Please note that any violation of “proper conduct” (e.g., disruption of class etc.) will result in your removal from this course.
- Students who require physical or academic accommodations are encouraged to speak privately to the instructor so that appropriate accommodations can be made in order that you may participate fully in the course. All conversations will remain confidential.
- Memorial University has many services to provide support to its students. These include, but are not limited to, the Counselling Centre (which offers workshops on study tips, test taking, etc), International students office, QEII Library, Writing Centre, Psych Society
Proposal for New Courses

Help Centre. If there are areas in which you are struggling or need extra assistance please contact either the instructor or the TA. If we cannot assist you directly we will attempt to refer you to the right people. We are here to help!

*The schedules, policies, and assignments in this course are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor and the students.

Sample Bibliography for Psychology 2930

This sample of recent research and review papers from a variety of sub disciplines in Psychology will be used as examples of writing styles for discussion. Students will not be required to learn the content of the papers per se. The course content comes from the assigned textbook and lectures.


Proposal for New Courses


Sample Course Outline and Method of Evaluation

Psychology 3820, Research Techniques in Behavioural Neuroscience

Fall 2016
Course Outline

Instructor: Dr. Jacqueline Blundell
Office: SN-1061
Phone: 864-7957
e-mail: jblundell@mun.ca

Lab instructor: Mr. Steve Milway
smilway@play.psych.mun.ca
Teaching assistants: TBA

Course Description: This course is designed to provide students with a better understanding of the techniques used to answer specific research questions in behavioral neuroscience. In this course, we will visit various (~ 8) laboratories on campus that are engaged in research relevant to behavioral neuroscience. In addition to laboratory observations and hands on tutorials, readings, discussions, presentations, and writing assignments will strengthen our understanding of the techniques used in behavioral neuroscience.

Evaluation:
Assignments (8 x 6% each, total of 48%): Each week, students will complete a short written assignment (for example, a summary of a research article or description of the technique we will observe) relevant to the specific lab we visit.

Class Participation (10%): Students will be expected to contribute to class discussions during the weekly lab visits and student presentations.

Laboratory Report (32%): The students will be expected to write a laboratory report based on data collected in one of the labs visited. This will be due at the end of the semester.

Presentation (10%): Students will give an oral presentation on their laboratory report.
Proposal for New Courses

Sample Course Outline and Method of Evaluation

Psychology 3830, Behavioural Endocrinology

Winter 2016

Instructor: Carolyn Walsh, PhD
Office: SN-3089
Tel: 864-4738
E-mail: carolynw@mun.ca

Office Hours: TBA
Class Location/Time: TBA
Teaching Assistants: TBA


Course Description: Behavioural endocrinology explores the behavioural effects of hormones and the question of how hormones act on the brain to influence behaviour. Topics include: basic concepts in neuroendocrinology, reproductive behaviour (sexual and parental), sexual differentiation of the brain and behaviour, aggressive behaviour, and the neuroendocrinology of stress, including the effects of stress on the brain and behaviour.

Evaluation Details:

Testing: 2 Mid-term Tests (20% each; total 40%) & Comprehensive Final Exam (35%)
Dates of midterms will NOT be altered unless the University is closed at the assigned date.

Assignment: Worth 25%; there will be one overall assignment to be submitted, to be submitted in two parts, each worth a percentage of your mark.

The Assignment will be a review of the literature on a research topic that you find particularly interesting in behavioural endocrinology- further details will be given in class.
Proposal for New Courses

**Psychology 3830 Class Schedule- Winter 2016**

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Lecture topic</th>
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| Week 1 | Chapter 1/Chapter 2 | Introduction to the Study of Behavioural Endocrinology  
The Endocrine System |
| Week 2 | Chapter 3 | Sex Differences: Determination/Differentiation                                  |
| Week 3 | Chapter 4 | Sex Differences: Animal Models and Humans                                      |
| Week 4 | Chapter 5/6 | Reproductive Behaviour                                                         |
| Week 5 | Chapter 6 (cont’d) | MIDTERM #1- 20% (Chapters 1-6)                                                 |
| Week 6 | Chapter 7 | Parental Behaviour                                                            |
| Week 7 | Chapter 8 | Hormones & Social Behaviour  
MT BREAK                          |
| Week 8 | Chapters 9/10 | Homeostasis & Biological Rhythms                                              |
| Week 9 | Chapter 11 | Stress                                                                        |
| Week 10 | Chapter 11 (cont’d) | MIDTERM TEST #2- 20% (Ch 7-11)                                                |
| Week 11 | Chapter 12 | Learning and Memory                                                           |
| Week 12 | Chapter 13 | Hormones and Affective Disorders                                               |
| Week 13 | Assigned Readings | Recent Developments in Behavioural Endocrinology                            |
Proposal for New Courses

Sample Course Outline and Method of Evaluation

Psychology 3510/3511, Directed Study

Sample Syllabus

Instructor: Dr. Ian Neath
Office: SN-3066H
Phone: 864-8159
Email: ineath@mun.ca

Calendar Description
3510 Directed Study provides an opportunity to work with an individual faculty member on a research project. The student will submit a formal written report of the research conducted. Permission of the instructor is required.

Required Textbooks
There are no required textbooks. Rather, assigned readings will all be journal articles that are available at the library (see below).

Evaluation
There are 3 components to the overall grade for this course:

1) 20% Mark assigned to research performance (e.g., timely completion of ethics training; interactions with volunteer participants; compliance with the research protocol; quality of preparation for individual meetings; presentation to the lab)
2) 70% Mark assigned to formal written report by supervisor
3) 10% Mark assigned to formal written report by Honours Thesis Coordinator

Research Experience
I have been conducting research on the effects of long-term memory factors on short-term memory performance. For example, one common measure of the capacity of short-term memory is memory span, the number of items that can be immediately recalled in order. However, memory span is affected by a number of lexical factors, including word frequency. The current project is investigating two other lexical factors, neighbourhood size and neighbourhood frequency. You will assist in collecting and analyzing data as part of this project.

Requirements
Like most research in cognitive psychology, this research requires testing volunteer participants one at a time. You will be trained on ethical issues and will be required to complete the TCPS2 Course on Research Ethics (http://tcps2core.ca/welcome). You will then receive additional training on appropriate procedures at Memorial, including the importance of the informed consent process.
Proposal for New Courses

You will work with other lab personnel to recruit, schedule, and test volunteer participants. You will also be asked to score some data and will also participate in conducting inter-scorder reliability measures.

You will attend lab meetings, and will be asked to present your research at a lab meeting at the end of the semester.

You will write a formal APA-style report of your research. This report is due on the last day of classes. To help you meet this deadline, the schedule below lists some deadlines for submitting various parts of the report. You will receive feedback on your drafts.

In both the lab meetings and in one-on-one meetings, you will be given the opportunity to discuss both the details of the specific research as well as how the project fits in with various theories of memory. You will be given readings from the primary literature, but you will also be asked to do a literature review to supplement these readings.

Time Commitment
This is a three credit hour course, and your time commitment is expected to be the same as for any other similar course. However, much of your schedule will be more variable because much of it will depend on the availability of volunteer participants. You will not test participants on any holiday or weekend.

Plagiarism
You are also responsible for knowing what constitutes plagiarism. Note that this course uses the APA definition of plagiarism, which is more specific than the University's definition.

Schedule
In addition to the items listed below, there will be lab meetings (day and time TBA) as well as additional one-on-one meetings with the instructor (day and times TBA).

Week 1 ......................... Lab orientation, ethics training, completion of TCPS2 CORE
Week 2 ......................... Training on specifics of experiment
Week 3-13 ..................... Testing volunteer participants
Week 6 ............................. Introduction section due
Week 8 ............................. Methods section due
Week 10 ......................... Outline of results section due
Week 11 ................................. Outline of discussion and references due
Week 12 ................................. Presentation during lab meeting
Week 13 ................................. Research report due

Initial Reading List

Proposal for New Courses


Proposal for New Courses

SUMMARY PAGE FOR SENATE

Approval Form

Course Number and Title

PSYC 2930, Research and Writing in Psychology

Abbreviated Course Title

Research and Writing in Psychology

Calendar Change

2930 Research and Writing in Psychology is an introduction to the fundamentals of preparing psychology reports, emphasizing organization, correct use of terminology, adherence to appropriate discipline style, concise and accurate description, preparation of abstracts, and integration of numerical data. Topics for reports will be selected each semester by the instructor.

PR: Admission to a Major in Psychology or Behavioural Neuroscience
UL: May not be used towards the Faculty of Arts CRW requirement or the former R/W requirement.

Secondary Calendar Changes

See section in the document, "proposal to revise existing programs" that integrates the 5 new courses into our degree requirements.

Rationale

This course will become a required course for the Psychology and Behavioural Neuroscience degree programs.

It is expected that instructors will tailor the course to their own area of expertise and will include demonstrations and/or labs that serve as the basis of written reports.

The rationale for proposing this course is that students are not being given a sufficient number of meaningful writing assignments sufficiently early in their undergraduate career. In this context, the term "meaningful writing assignment" means that the student receives detailed feedback on his or her assignments such that feedback may be incorporated into subsequent assignments in the course. This may take the form of multiple writing assignments throughout the semester or a draft and a final version of an assignment. This contrasts with writing a paper that is turned in at the end of the course and which many students will never see again.
Proposal for New Courses

The Psychology Department is also proposing to eliminate PSYC 2570, Understanding Individual Differences. PSYC 2570 is currently required for the Psychology and Behavioural Neuroscience degree programs. Thus, deleting PSYC 2570 while adding PSYC 2930, makes this recommendation neutral with respect to faculty teaching resources.

The rationale is the following: During the last curriculum revision, PSYC 2520 and PSYC 2570 were required so that all students had exposure to neuroscience (2520) as well as (for want of a better term) exposure to a focus on individuals (2570). It is likely that whereas students still need to be forced to take a neuroscience course (2520), it is less likely that students are avoiding all courses with content similar to that of 2570. Moreover, 2570 has not been a popular course historically. Therefore, the second year would be re-organized as follows:

1. Instruction on research methods and statistics (2910/2911), to lay the foundation for the 3000-level courses
2. Instruction on writing and communicating in psychology (2930), again to lay the foundation for upper-level courses.
3. Instruction on neuroscience as it relates to other areas (2520), on the assumption that many majors might not ordinarily choose to take a 3000-level neuroscience course
4. No instruction on individual differences, on the assumption that many majors will take upper-level courses in related areas.

Course Number and Title

PSYC 3820, Research Techniques in Behavioural Neuroscience

Abbreviated Course Title

Techniques in Behavioural Neuroscience

Calendar Change

PSYC 3820 Research Techniques in Behavioural Neuroscience allows students to increase their understanding of how knowledge is generated in the study of neuroscience and behaviour. Students will visit various laboratories on campus that are engaged in research relevant to these fields. In addition to observations and hands-on tutorials, readings, discussions, and writing assignments will strengthen students' understanding of the techniques used to answer specific research questions in neuroscience and behaviour.

PR: PSYC 2520, 2930 and 2911, Biology 1001 and 1002, and admission to a Major in Psychology or Behavioural Neuroscience

Secondary Calendar Changes

See section in the document, "proposal to revise existing programs" that integrates the 5 new courses into our degree requirements.
Proposal for New Courses

Rationale

The Psychology Department recently completed an Academic Program Review. In the section of its report dealing with the Behavioural Neuroscience degree program, the Review Panel made several recommendations. These include the following.

First, it noted a lack of neuroscience-specific course offerings as a weakness of the program and encouraged the development of new courses to remedy this. It also recommended that the BHNMR degree program be restructured to be more interdisciplinary. Finally, it recommended increasing connections with neuroscientists in the Faculty of Medicine. In accepting this advice, we propose this new course, which will be interdisciplinary and invite participation of those doing research in any area relevant to neuroscience and behaviour. For example, this will include neuroscientists in Psychology as well as in the Division of BioMedical Sciences in Medicine. It will also include those doing animal behaviour research in Psychology and Biology as well as geneticists with an interest in behaviour in Biology and the Faculty of Medicine. The organization of the course will be the responsibility of the Psychology Department, and will be assigned to one, or possibly two, faculty members in Psychology. It is expected that faculty from other academic units will participate in the course from year to year.

Our students receive some exposure to neuroscience research techniques in Psychology 4870, Research Experience in Neuroscience. However, that experience is limited and comes late in a student's program. Offering this interdisciplinary course in the 3rd year will expose students to a variety of research techniques earlier in their program. It will also allow them to become acquainted with faculty outside of Psychology who have different approaches and employ different methods related to neuroscience and behaviour. One advantage of this is that students who intend to complete an honours degree will have a better idea of the research opportunities available to them.

Course Number and Title

PSYC 3830, Behavioural Endocrinology

Abbreviated Course Title

Behavioural Endocrinology

Calendar Change

PSYC 3830  Behavioural Endocrinology explores the behavioural effects of hormones and the question of how hormones act on the brain to influence behaviour. Topics include: basic concepts in neuroendocrinology, reproductive behaviour (sexual and parental), sexual differentiation of the brain and behaviour, aggressive behaviour, and the neuroendocrinology of stress, including the effects of stress on the brain and behaviour.

PR: PSYC 2520, 2930 and 2911, Biology 1001 and 1002, and admission to a Major in Psychology or Behavioural Neuroscience
Proposal for New Courses

Secondary Calendar Changes

See section in the document, "proposal to revise existing programs" that integrates the 5 new
courses into our degree requirements.

Rationale

The effects of hormones on behaviour are many and can be powerful. Some of these are
covered in PSYC 3533, Sexual Behaviour, and PSYC 3750, Animal Behaviour I. However,
coverage in those courses is very limited and primarily describes behavioural effects of
hormones without addressing mechanisms in any depth. In contrast, the new course will focus
on mechanisms, i.e. how hormones act on the brain to change behaviour. Thus it includes
basic concepts of molecular and cellular endocrinology as they apply to the brain, e.g. the
nature of hormone receptors, where such receptors are found in the brain, and how hormon-
sensitive neurons and circuits mediate the effects of hormones on behaviour. As such, it is
designed to increase our course offerings for students in our Behavioural Neuroscience degree
program. We note that there will be some content overlap with Biology 4550, Principles of
Endocrinology. However, we don’t feel a credit restriction is necessary. If faculty resources
permit we plan to offer this course once each year. Carolyn Walsh has agreed to teach it.
However, since it is an elective, its occasional absence won’t prevent BHNQ students from
completing their programs.

---

Course Number and Title

PSYC 3510/3511, Directed Study

Abbreviated Course Title

Directed Study

Calendar Changes

3510 Directed Study provides an opportunity to work with an individual faculty member
on a research project. The student will submit a formal written report of the research
conducted. Permission of the instructor is required.

PR: PSYC 2910, 2911 and 2930 and admission to a Major in Psychology or
Behavioural Neuroscience

3511 Directed Study provides an opportunity to work with an individual faculty member
on a research project. The student will submit a formal written report of the research
conducted. Permission of the instructor is required.
Proposal for New Courses

PR: PSYC 2910, 2911 and 2930 and admission to a Major in Psychology or Behavioural Neuroscience

Secondary Calendar Changes

See section in the document, “proposal to revise existing programs” that integrates the 5 new courses into our degree requirements.

Rationale

The Directed Study courses are electives designed to offer our majors additional research opportunities. They can be thought of as a scaled-down version of the honours thesis (PSYC 499A/B). The student works on a research project, supervised by the instructor, and writes a report. There are two Directed Study courses so that a given student can have two such opportunities. These courses do not replace any existing courses or requirements for the major; rather, they are optional courses that students can take if they so wish.

These courses would likely work differently for different faculty. For example, one faculty member may have 3 or 4 students, each testing subjects for an experiment. A different faculty member may be able to supervise only 1 student, and that student may be doing collection of data from archival sources. The students benefit by getting exposure to lab work prior to the honours thesis, and by working with an additional faculty member who will know them well when the students request letters of recommendation.

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</table>
Proposal for New Courses

School of Nursing  no
School of Social Work no
Library Report Received yes

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

Name Dr. Mark Abrahams
Dean, Faculty of Science

FOR OFFICE USE ONLY

APPROVAL GRANTED BY SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Chair:

Secretary:

Date:
Proposal to Change Existing Programs

Proposal
Calendar Changes to Existing Programs

Executive Summary

The Psychology Department has recently undergone an Academic Program Review. This process led the department to evaluate our course offerings. As a result we are proposing changes to our Psychology and Behavioural Neuroscience (BHN) degree programs. These include revisions of three existing courses, the creation of five new courses and the elimination of two courses. Additional information about these changes is included in two other documents, “proposal to change existing courses” and “proposal for new courses”.

Resource Implications: Instructional Costs

No new costs will be incurred for either instructors or infrastructure. We have carefully considered the resource implications of these changes and are confident they can be made without increasing the demand for faculty resources or administrative and academic support. The new courses will be taught by current faculty as part of their regular teaching load. The issue of faculty resources is addressed in more detail in the sections that follow.

Consultations

Appropriate academic units have been consulted. See email attached.

Library Holdings and/or Other Resources Required

The library has been contacted. See email attached.

The costs, if any, associated with these changes can be met from within the existing budget allocation or authorized new funding for the Department of Psychology.

Signature of Unit Head (if appropriate): ______________________________

Date: ______________________________

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

Date: ______________________________
Proposal to Change Existing Programs

SUMMARY PAGE FOR SENATE

Approval Form

Program Title: Psychology and Behavioural Neuroscience Degree Programs

Calendar Changes

9.11.3 Requirements for a Major in Psychology

Students completing this program cannot receive credit for Psychology 2920. Students who intend to pursue graduate studies should take courses leading to the Honours degree.

1. Students may Major in Psychology as part of either a B.A. or a B.Sc. program. All Majors are required to complete a minimum of 42 credit hours of Psychology as listed below:
   a. Psychology 1000, 1001, 2520, 2570, 2530, 2910, 2911
   b. Twelve credit hours in Psychology chosen from the following: 3050, 3100, 3250, 3350, 3450, 3620, 3650, 3750, 3800 or 3804.
   c. Twelve credit hours of 4000-level courses in Psychology, of which at least one must be a research experience course and one must be a selected topics course.

2. Psychology Majors following the B.Sc. program are also required to complete the following:
   a. Mathematics 1000 (or equivalent).
   b. Biology 1001 and 1002
   c. Either Chemistry 1010 and 1011 (or 1050 and 1051); OR Physics 1020 (or 1050) and 1021 (or 1051)

   Note: First year students should think carefully about whether Chemistry or Physics best suits their future program needs. Students should examine the prerequisites for upper-level science courses and attempt to take them in their first year.

   d. Six credit hours of laboratory courses at the 2000 level or above in one of Biology, Chemistry, or Physics.

   Note: Biology/Psychology 4701 and Biology 3053 cannot be used to satisfy the requirement of 6 laboratory credit hours at the 2000 level or above in either Biology, Chemistry, or Physics.

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

9.11.4 Requirements for Honours in Psychology

Students completing this program cannot receive credit for Psychology 2920.

1. Honours students in Psychology are required to complete the 60 credit hours of Psychology as listed below:
   a. Psychology 1000, 1001, 2520, 2570, 2530, 2910, 2911, 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.
Proposal to Change Existing Programs

2. Honours students must also complete the requirements listed in either Clause 2. or Clause 3., as applicable, of the requirements for a Major in Psychology.

3. Honours students will be required to submit in their graduating year, an undergraduate thesis (Psychology 499A/B) which demonstrates their competence in Experimental Psychology.

9.11.5 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. The program for a Major in Behavioural Neuroscience shall include:

1. Psychology 1000, 1001, 2520, 2570, 2930, 2910, 2911, 3250, 3800, 3904, 3820
   a. Six Three credit hours in Psychology chosen from the following: 3050, 3100, 3250, 3350, 3450, 3620, 3650, 3750.
   b. Six credit hours of 4000 level courses in Psychology, of which one must be a research experience course.
   c. One selected topics course and one research experience course of which one must be chosen from the following list of six: 4250, 4251, 4850, 4851 (selected topics), 4270, 4870 (research experience).

2. Mathematics 1000 (or equivalent) and 1001
   a. Chemistry 1010 and 1011 (or 1050 and 1051), and 2440 (or 2400/2401)
   b. Physics 1020 (or 1050) and 1021 (or 1051).
   c. Biology 1001 and 1002
   d. English 1080 and one of 1101, 1102, 1103, or 1110, or equivalent

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 2000, 2005, the former 2010, the former 2011, 3202, 3402, or 4502
   b. Biology: 2060, 2210, 2250, 2900, 3050, 3160, 3202, 3295, 3401, 3500, 3530, 3540, 3750, 4200, 4241, 4245, 4250, 4402, the former 4450, 4601, 4605, 4701, the former 4900 (see note below)
   c. Chemistry: 2100, 2210, 2301 (or 2300) or any 3000 or 4000 level course
   d. Computer Science: Any 2000, 3000, or 4000 level course except 2650 and 2801
   e. Mathematics: 2000, 2050, 2051, 3000, 3001 or any 3000 or 4000 level pure or applied mathematics course
   f. Physics: Any 2000, 3000, or 4000 level course except 2151, 3150, 3151

Notes: 1. Credit may not be obtained for both Biology 3750 and Psychology 3750 or for both Biology 4701 and Psychology 4701.
2. 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.
Proposal to Change Existing Programs

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

Students completing this program cannot receive credit for Psychology 2920.

1. Honours students in Behavioural Neuroscience are required to complete the following Psychology courses: 1000, 1001, 2520, 2679, 2930, 2910, 2911, 3250, 3800, 3804, 3820, 3900, 499A/B, two one further courses in Psychology chosen from the following: 3050, 3100, 3250, 3350, 3450, 3620, 3650, 3750; two 4000-level courses in Psychology of which one must be a research experience course, one selected topics course and one research experience course of which one must be chosen from the following list of six: 4250, 4251, 4850, 4851 (selected topics), 4270, 4870 (research experience).

2. Honours students in Behavioural Neuroscience must also complete the requirements listed in Clauses 2. and 3. of the requirements for a Major in Behavioural Neuroscience.

3. In accordance with Academic Standing, clause 1 of the Regulations for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, OR an average of 75% or higher in all the required courses listed in Clauses 1. and 3. of the requirements for a major in Behavioural Neuroscience and Clause 1 of the requirements for honours in Behavioural Neuroscience, except those at the 1000

Secondary Calendar Changes

Section 9.11.9 Suggested Course Sequences. Suggested course sequences for our Co-operative programs must be revised to delete PSYC 2570 and replace it with PSYC 2930, and to delete PSYC 3801 and replace it with PSYC 3820 as follows.

Co-operative BA and Honours BA in Psychology:

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<th>Fall Semester 3</th>
<th>Winter Semester 4</th>
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Co-operative BSc and Honours BSc in Psychology:

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Proposal to Change Existing Programs

| Semester 4 | 
| --- | --- |
| Elective or Science requirement |
| Elective or Science requirement |
| Psychology 2911 |
| Psychology 2570 2930 (or 2520) |

Cooperative BSc in Behavioural Neuroscience:

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Proposal to Change Existing Programs

- Elective or Science requirement
- Elective or Science requirement
- Selected Topics

Co-operative Honours BSc in Behavioural Neuroscience:

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Spring (Optional)

- Psychology 499A

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Proposal to Change Existing Programs

| • Elective or Science requirement  
| • Psychology 499B  
| • Selected Topics |

Joint programs with Biochemistry and Biology must be revised as follows.

5.1.6 Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours

*Note:* Students completing this program cannot receive credit for Psychology 2920.

The following courses (or equivalent) are required to complete the 120 credit hours in courses required for the degree:

1. Chemistry 1050 and 1051 (or equivalent), Biology 1001 and 1002, Mathematics 1000 and 1001, Physics 1050 (or 1020) and 1051, English 1080 and 1110.
2. Biochemistry 2100, 2101, 3105, 3106, 3107, 3108, Medicine 310A/B, either 4210 or 4211, 9 credit hours chosen from Biochemistry 4002, 4101, 4102, 4103, 4104, 4105, 4200, 4201, 4220, 4230-4249. *Note:* Only one of 4105 and 4220 may be chosen.
3. Psychology 1000, 1001, 2520, 2670, 2930, 2910, 2911, 3800, 3801, 3820, 3900, two further courses in Psychology chosen from the following: 3050, 3100, 3250, 3350, 3450, 3620, 3650, 3750; two 4000 level courses in Psychology of which one must be a research experience course; one selected topics course and one research experience course of which one must be chosen from the following list of six: 4250, 4251, 4850, 4851 (selected topics), 4270, 4870 (research experience).
4. Either Biochemistry 499A/B or Psychology 499A/B.
5. Chemistry 2300 or 2301, 2400, 2401.

*Notes:*
1. In accordance with Clause 6. a. of the Regulations for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 2., 3. and 4. above, except those at the 1000 level.
2. Students in first year intending to follow this program should note the regulations for admission to Major programs in Psychology and that the deadline for submission of a completed application form to the Psychology Department is June 1 for the Fall semester and October 1 for the Winter semester.

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

*Note:* Students completing this program cannot receive credit for Psychology 2920.

The following courses (or equivalent) are required:

1. Chemistry 1010 and 1011 (or 1050, 1051), Biology 1001 and 1002, Mathematics 1000, Physics 1020 or 1050, and 1021 (or 1051), English 1080 and 1110.
2. Biochemistry 2100, 2101, 2600, 3106, 3203, 4002, 4300, 4301, 4502, Medicine 310A/B; one course chosen from: Biochemistry 3105, 3107, 3108, 3202, 3402, 3600, 4101, 4103, 4104, 4105, 4200, 4201, 4210, 4211, 4220, 4230-4249, Biology 3050.
3. Psychology 1000, 1001, 2520, 2670, 2930, 2910, 2911, 3800, 3801, 3820, 3900; two further courses in Psychology chosen from the following: 3050, 3100, 3250, 3350, 3450, 3620, 3650, 3750; two 4000 level courses in Psychology of which one must be a research experience course, one selected topics course and one research experience course of which one must be chosen from the following list of six: 4250, 4251, 4850, 4851 (selected topics), 4270, 4870 (research experience).
Proposal to Change Existing Programs

4. Either Biochemistry 499A/B or Psychology 499A/B.
5. Chemistry 2400, 2401 or Chemistry 2440.
6. Other courses to complete at least the prescribed minimum of 120 credit hours in courses for the Joint Honours Degree.

Notes:
1. In accordance with Clause 6.a. of the Regulations for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, or an average of 75% or higher in all the required courses listed in Clauses 2., 3., and 4. above, except those at the 1000 level.
2. Students in first year intending to follow this program should note the regulations as outlined for admission to Major programs in Psychology and that the deadline for submission of a completed application form to the Psychology Department is June 1 for the Fall semester and October 1 for the Winter semester.

5.1.9 Biology and Psychology Joint Honours

Note: Students completing this program cannot receive credit for Psychology 2920.

The following forty courses (or equivalent) are required:

1. Biology 1001, 1002, 2060, 2250, 2600, 2900; one of 3401, 3402, 4245, 4404; four Biology electives at the 2000, 3000 or 4000 level not including Biology 499A or 499B.
2. Psychology 1000, 1001, 2520, 2570, 2930, 2910, 2911, 3250, 3800 or 3904; 3900, 4910; one of the following: 3050, 3100, 3350, 3450, 3620, 3650; one further 4000 level Psychology research experience course.
3. Biology or Psychology 3750, 4701, 499A/B.
4. English 1080 and 1110; Mathematics 1000; Chemistry 1010 and 1011 (or 1050 and 1051), and 2440; Physics 1020 (or 1050) and 1021 (or 1051); Biochemistry 2101 and 3106.
5. Other courses, if necessary, to complete at least 120 credit hours of courses.

5.1.10 Biology and Psychology (Behavioural Neuroscience) Joint Honours

Note: Students completing this program cannot receive credit for Psychology 2920.

The following forty courses (or equivalent) are required:

1. Biology 1001, 1002, 2060, 2250, 2600, 2900; one of 3401, 3402, 4245, 4404; five Biology electives at the 2000, 3000 or 4000 level not including Biology 499A or 499B.
2. Psychology 1000, 1001, 2520, 2570, 2930, 2910, 2911, 3800, 3804, 3820, 3900; two further courses in Psychology chosen from the following: 3050, 3100, 3250, 3350, 3450, 3620, 3650, 3750; two 4000-level courses in Psychology of which one must be a research experience course one selected topics course and one research experience course of which one must be chosen from the following list of six: 4250, 4251, 4850, 4851 (selected topics), 4270, 4870 (research experience).
3. Biology or Psychology 499A/B.
5. English 1080 and 1110; Mathematics 1000 and 1001; Physics 1020 (or 1050) and 1021 (or 1051); Chemistry 1010 and 1011 (or 1050 and 1051), and 2440 (or 2400 and 2401);
6. Other courses, if necessary, to complete at least 120 credit hours of courses.

Note: In accordance with Clause 6.a. of the Regulations for the Honours Degree of Bachelor of Science, Honours candidates must obtain a grade of "B" or better, OR average of 75% or higher in all
Proposal to Change Existing Programs

*the required courses listed in Clauses 1, 2, 3, and 4 above, except those at the 1000 level.*

Rationale

The Psychology Department has recently undergone an Academic Program Review. This process led the department to evaluate our course offerings. As a result we are proposing changes to our Psychology and Behavioural Neuroscience (BHNR) degree programs. A more detailed rationale for the introduction of 5 new courses and the elimination of 2 existing courses follows below.

In addition, a minor change is included in section 9.11.3 Requirements for a Major in Psychology. In the note at the end of that section we have added Biology 3053 (Microbiology for Nurses) as a course that cannot be used to satisfy the requirement for six credit hours of laboratory courses at the 2000 level or above in one of Biology, Chemistry, or Physics. This will make our entry consistent with that of Biology which has judged that Biology 3053 is not acceptable as one of the required courses for the Minor, Major or Honours programs in Biology, nor is it acceptable for any of the joint programs between Biology and other disciplines.

Finally, we are requesting a secondary Calendar change in section 5.1.6.2 which describes the requirements for the Biochemistry and Psychology (Behavioural Neuroscience) Joint Honours degree program. Currently that section includes the following: **Note: Only one of 4105 and 4220 may be chosen.** As part of this consultation process Biochemistry has requested that this note be deleted. BIOC 4105 (Immunology) and BIOC 4220 (Introduction to General and Autonomic Pharmacology) have no overlap in content. Biochemistry comments that the note was pertinent when both of those courses were taught by the Faculty of Medicine. However BIOC 4105 (Immunology) is now taught by the department of Biochemistry. Biochemistry revised most of their programs last year to remove this restriction.
Proposal to Change Existing Programs

Consultations Sought From

Faculty of Science, Department of:

Biochemistry    yes
Biology      yes
Chemistry    no
Computer Science    no
Earth Sciences    no
Mathematics and Statistics    yes
Ocean Sciences    no
Physics and Physical Oceanography    yes

Other Academic Units

Faculty of Arts    yes
Grenfell VP Office    no
Marine Institute    yes
Faculty of Education    yes
School of Human Kinetics and Recreation    yes
School of Nursing    no
School of Social Work    no

Library Report Received    yes

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

Name    Dr. Mark Abrahams
Dean, Faculty of Science

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APPROVAL GRANTED BY SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Chair:

Secretary:

Date:
Proposal to Change Existing Programs

Proposed Calendar Description of New Course

2930  Research and Writing in Psychology is an introduction to the fundamentals of preparing psychology reports, emphasizing organization, correct use of terminology, adherence to appropriate discipline style, concise and accurate description, preparation of abstracts, and integration of numerical data. Topics for reports will be selected each semester by the instructor.

PR: Admission to a Major in Psychology or Behavioural Neuroscience
UL: May not be used towards the Faculty of Arts CRW requirement or the former R/W requirement.

Rationale

This course will become a required course for the Psychology and Behavioural Neuroscience degree programs.

It is expected that instructors will tailor the course to their own area of expertise and will include demonstrations and/or labs that serve as the basis of written reports.

The rationale for proposing this course is that students are not being given a sufficient number of meaningful writing assignments sufficiently early in their undergraduate career. In this context, the term “meaningful writing assignment” means that the student receives detailed feedback on their assignments such that feedback may be incorporated into subsequent assignments in the course. This may take the form of multiple writing assignments throughout the semester or a draft and a final version of an assignment. This contrasts with writing a paper that is turned in at the end of the course and which many students will never see again.

The Psychology Department is also proposing to eliminate PSYC 2570, Understanding Individual Differences. PSYC 2570 is currently required for the Psychology and Behavioural Neuroscience degree programs. Thus, deleting PSYC 2570 while adding PSYC 2930, makes this recommendation neutral with respect to faculty teaching resources.

The rationale is the following: During the last curriculum revision, PSYC 2520 and PSYC 2570 were required so that all students had exposure to neuroscience (2520) as well as (for want of a better term) exposure to a focus on individuals (2570). It is likely that whereas students still need to be forced to take a neuroscience course (2520), it is less likely that students are avoiding all courses with content similar to that of 2570. Moreover, 2570 has not been a popular course historically. Therefore, the second year would be re-organized as follows:

1. Instruction on research methods and statistics (2910/2911), to lay the foundation for the 3000-level courses
2. Instruction on writing and communicating in psychology (2930), again to lay the foundation for upper-level courses.
3. Instruction on neuroscience as it relates to other areas (2520), on the assumption that many majors might not ordinarily choose to take a 3000-level neuroscience course
4. No instruction on individual differences, on the assumption that many majors will take upper-level courses in related areas.
Proposal to Change Existing Programs

Proposed Calendar Description of New Course

PSYC 3820 Research Techniques in Behavioural Neuroscience allows students to increase their understanding of how knowledge is generated in these fields. Students will visit various laboratories on campus that are engaged in research relevant to neuroscience and behaviour. In addition to observations and hands on tutorials, readings, discussions, and writing assignments will strengthen students' understanding of the techniques used to answer specific research questions in neuroscience and behaviour.

PR: PSYC 2520, 2930 and 2911, Biology 1001 and 1002, and admission to a Major in Psychology or Behavioural Neuroscience

Rationale

The Psychology Department recently completed an Academic Program Review. In the section of its report dealing with the Behavioural Neuroscience degree program, the Review Panel made several recommendations. These include the following.

First, it noted a lack of neuroscience-specific course offerings as a weakness of the program and encouraged the development of new courses to remedy this. It also recommended that the BHNRI degree program be restructured to be more interdisciplinary. Finally, it recommended increasing connections with neuroscientists in the Faculty of Medicine. In accepting this advice, we propose this new course, which will be interdisciplinary and invite participation of those doing research in any area relevant to neuroscience and behaviour. For example, this will include neuroscientists in Psychology as well as in the Division of BioMedical Sciences in Medicine. It will also include those doing animal behaviour research in Psychology and Biology as well as geneticists with an interest in behaviour in Biology and the Faculty of Medicine. The organization of the course will be the responsibility of the Psychology Department, and will be assigned to one, or possibly two, faculty members in Psychology. It is expected that faculty from other academic units will participate in the course from year to year.

Our students receive some exposure to neuroscience research techniques in Psychology 4870, Research Experience in Neuroscience. However, that experience is limited and comes late in a student's program. Offering this interdisciplinary course in the 3rd year will expose students to a variety of research techniques earlier in their program. It will also allow them to become acquainted with faculty outside of Psychology who have different approaches and employ different methods related to neuroscience and behaviour. One advantage of this is that students who intend to complete an honours degree will have a better idea of the research opportunities available to them.

Proposed Calendar Description of New Course

PSYC 3830 Behavioural Endocrinology explores the behavioural effects of hormones and the question of how hormones act on the brain to influence behaviour. Topics include: basic concepts in neuroendocrinology, reproductive behaviour (sexual and parental), sexual differentiation of the brain and behaviour, aggressive behaviour, and the neuroendocrinology of stress, including the effects of stress on the brain and behaviour.

PR: PSYC 2520, 2930 and 2911, Biology 1001 and 1002, and admission to a Major in Psychology or Behavioural Neuroscience
Proposal to Change Existing Programs

Rationale

The effects of hormones on behaviour are many and can be powerful. Some of these are covered in PSYC 3533, Sexual Behaviour, and PSYC 3750, Animal Behaviour I. However, coverage in those courses is very limited and primarily describes behavioural effects of hormones without addressing mechanisms in any depth. In contrast, the new course will focus on mechanisms, i.e. how hormones act on the brain to change behaviour. Thus it includes basic concepts of molecular and cellular endocrinology as they apply to the brain, e.g. the nature of hormone receptors, where such receptors are found in the brain, and how hormone-sensitive neurons and circuits mediate the effects of hormones on behaviour. As such, it is designed to increase our course offerings for students in our Behavioural Neuroscience degree program. We note that there will be some content overlap with Biology 4550, Principles of Endocrinology. However, we don't feel a credit restriction is necessary. If faculty resources permit we plan to offer this course once each year. Carolyn Walsh has agreed to teach it. However, since it is an elective, its occasional absence won't prevent BHNR students from completing their programs.

Proposed Calendar Description of New Courses

3510 Directed Study provides an opportunity to work with an individual faculty member on a research project. The student will submit a formal written report of the research conducted. Permission of the instructor is required.

PR: PSYC 2911 and 2930 and admission to a Major in Psychology or Behavioural Neuroscience

3511 Directed Study provides an opportunity to work with an individual faculty member on a research project. The student will submit a formal written report of the research conducted. Permission of the instructor is required.

PR: PSYC 2911 and 2930 and admission to a Major in Psychology or Behavioural Neuroscience

Rationale

The Directed Study courses are electives designed to offer our majors additional research opportunities. They can be thought of as a scaled-down version of the honours thesis (PSYC 499A/B). The student works on a research project, supervised by the instructor, and writes a report. There are two Directed Study courses so that a given student can have two such opportunities. These courses do not replace any existing courses or requirements for the major; rather, they are optional courses that a student can take if they so wish.

These courses would likely work differently for different faculty. For example, one faculty member may have 3 or 4 students, each testing subjects for an experiment. A different faculty member may be able to supervise only 1 student, and that student may be doing collection of data from archival sources. The faculty member benefits by getting more data collected and by having additional HQP to list on Tri-Council grant applications. The students benefit by getting exposure to lab work prior to the honours thesis, and by working with an additional faculty member who will know them well when the students request letters of recommendation.
January 12, 2015

TO: All Members, Faculty Council of Science

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

SUBJECT: Calendar Change

At a meeting held on December 16, 2014, the Undergraduate Studies Committee of the Faculty of Science agreed that the following Calendar change be forwarded to Faculty Council for approval:

Deletion of Science 5998: Exchange Programs in Science

Joan Burry
Associate Registrar and Secretary: Committee on Undergraduate Studies, Faculty of Science
Proposal
Calendar Change(s) to Existing Course(s)

Course Number and Title

SCI 5998 Exchange Program in Science

Proposed Change(s) to Calendar Description

Delete course from calendar

Course Description: will be available only to students attending Memorial University of Newfoundland as part of a formal exchange agreement, memorandum of understanding, or other special arrangement. This course will normally be offered twice a year, from March to August and September to February.

CH: 3—15, to be determined for each offering by the Dean in consultation with the appropriate Head of Department or Co-ordinator.
PR: permission of the Dean of Science
UL: may be repeated for credit once.

Rationale for Change(s)

In the past the course code SCI 5998 was used to accommodate visiting students in the Faculty of Science as no other way of accounting for these students existed at the time. However, since the creation of UGRD 5900 and GRAD 9900 course codes, it is no longer relevant or needed.

Consultations

Library Holdings and/or Other Resources Required

None.

The costs, if any, associated with this change/these changes can be met from within the existing budget allocation or authorized new funding for the Faculty of Science.

Signature of Unit Head (if appropriate):

Date:

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

Date:
SUMMARY PAGE FOR SENATE

Approval Form

Course Title and Number  SCI 5998 Exchange Program in Science

Abbreviated Course Title

Calendar Description Change(s)

Delete course from calendar

Rationale

In the past the course code SCI 5998 was used to accommodate visiting students in the Faculty of Science as no other way of accounting for these students existed at the time. However, since the creation of UGRD 5900 and GRAD 9900 course codes, it is no longer relevant or needed.

Consultations Sought From

Marine Institute
Grenfell campus
Department of Biochemistry
Department of Biology
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
Department of Physics and Physical Oceanography
Department of Psychology
Faculty of Arts
Faculty of Education
Faculty of Engineering and Applied Science

Comments Received

YES
YES

Library Report Received

Yes

Approved by Dean, Associate Vice-President (Academic) or Vice-President

Yes/No

Name

-----------------------------------------------------------------------
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APPROVAL GRANTED BY SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Chair: ________________________________

Secretary: _____________________________

Date: _________________________________
Begin forwarded message:

From: Math Consult <mathconsult@mun.ca>
Subject: Re: Calendar Change, Faculty of Science
Date: November 4, 2014 at 2:39:27 PM NST
To: "Associate Dean of Science (Undergraduate)" <adsu@mun.ca>

The Dept of Math and Stats has no objection to this proposal.

Harold Johnson

On 10/14/2014 1:32 PM, Associate Dean of Science (Undergraduate) wrote:
Dear Colleagues:

I have attached a document proposing a calendar change to delete SCI 5998, Exchange Program in Science, from the calendar. Since the creation of UGRD 5900 and GRAD 9900 course codes, it is no longer relevant or needed.

Thank you very much, and I look forward to your feedback.

Aimée

DR. AIMÉE SURPRENANT | INTERIM ASSOCIATE DEAN OF SCIENCE
(Administration & Undergraduate)
Memorial University
St. John's, NL, Canada A1B 3X7
T 709-864-8155

Aimée

No issues from Biochemistry.

Mark

Mark D. Berry Ph.D.
Professor and Head
Dept. Biochemistry
Memorial University of Newfoundland
St. John's, NL, Canada A1B 3X9

Tel: (709) 864-8529
E-mail: biohead@mun.ca; mberry@mun.ca

From: Associate Dean of Science (Undergraduate)  
Sent: Tuesday, October 14, 2014 1:32 PM  
To: Taylor-Harding, Dianne; associatevpooffice@grenfell.mun.ca; miugconsultations@mi.mun.ca; Biochemistry Head; David Innes; Peter Pickup; cs-chair@mun.ca; jhanchar@mun.ca; mathconsult@mun.ca; Fletcher, Garth; Brad deYoung; psychology.head@mun.ca  
Subject: Calendar Change, Faculty of Science

Dear Colleagues:

I have attached a document proposing a calendar change to delete SCI 5998, Exchange Program in Science, from the calendar. Since the creation of UGRD 5900 and GRAD 9900 course codes, it is no longer relevant or needed.

Thank you very much, and I look forward to your feedback.

Aimée

DR. AIMEE SURPRENANT | INTERIM ASSOCIATE DEAN OF SCIENCE  
(Administration & Undergraduate)  
Memorial University  
St. John's, NL, Canada A1B 3X7  
T 709-864-8155  
adsu@mun.ca

From: MIUG Consultations <MIUGconsultations@mi.mun.ca>  
Subject: RE: Calendar Change, Faculty of Science  
Date: October 15, 2014 at 1:39:40 PM NDT  
To: "Associate Dean of Science (Undergraduate)" <adsu@mun.ca>

Aimée,

Thank you for the opportunity to review the change / deletion of course
SCI5998. This change in program will have no impact on the undergraduate programs here at the Marine Institute.

We are happy to support this change as presented.

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

From: Associate Dean of Science (Undergraduate)  
[mailto:adsu@mun.ca]  
Sent: Tuesday, October 14, 2014 1:33 PM  
To: Taylor-Harding, Dianne; associatevpoffice@grenfell.mun.ca; MIUG Consultations; Biochemistry Head; David Innes; Peter Pickup; cs-chair@mun.ca; jhanchar@mun.ca; mathconsult@mun.ca; Fletcher, Garth; Brad deYoung; psychology.head@mun.ca  
Subject: Calendar Change, Faculty of Science

Dear Colleagues:

I have attached a document proposing a calendar change to delete SCI 5998, Exchange Program in Science, from the calendar. Since the creation of UGRD 5900 and GRAD 9900 course codes, it is no longer relevant or needed.

Thank you very much, and I look forward to your feedback.

Aimée
Hi Aimee: Seems like a logical step to me. I approve.

Best regards

Garth

From: Associate Dean of Science (Undergraduate)
Sent: October-14-14 1:33 PM
To: Taylor-Harding, Dianne; associatevpooffice@grenfell.mun.ca; miugconsultations@mi.mun.ca; Biochemistry Head; David Innes; Peter Pickup; cs-chair@mun.ca; jhanchar@mun.ca; mathconsult@mun.ca; Fletcher, Garth; Brad deYoung; psychology.head@mun.ca
Subject: Calendar Change, Faculty of Science

Dear Colleagues:

I have attached a document proposing a calendar change to delete SCI 5998, Exchange Program in Science, from the calendar. Since the creation of UGRD 5900 and GRAD 9900 course codes, it is no longer relevant or needed.

Thank you very much, and I look forward to your feedback.

Aimée
January 13, 2015

TO: All Members, Faculty Council of Science

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

SUBJECT: Response to Senate Committee on Undergraduate Studies re: Changes to General Academic Regulations 6.6 EVALUATION and 6.7 EXAMINATIONS

In a November 3, 2014 memorandum, the Senate Committee on Undergraduate Studies requested input from academic units on proposed changes to General Academic Regulations 6.6. EVALUATION and 6.7 EXAMINATIONS. The Undergraduate Studies Committee of the Faculty of Science considered the proposal at a meeting held on December 16, 2014 and agreed that the following comments should be forwarded to the Senate Committee on Undergraduate Studies.

No concerns were expressed about Regulation 6.7 EXAMINATIONS; most of the discussion was focussed on 6.6. EVALUATION, specifically 6.6.2 Course Syllabus, 6.6.3 Scheduling of Parts of the Evaluation, and 6.6.6 Correction and Return of Student Work. With respect to 6.6.2, it was felt that having to include the probable dates of all in-class parts of evaluation is too restrictive and not in the best interest of students; it prevents instructors from tailoring evaluation to the completion of topics and forces testing for non-pedagogical reasons.

Concern was raised about 6.6.3.4; as it is now written it prevents evaluation of laboratory reports completed in the last two weeks of the semester. Members also expressed the view that this regulation could give students the erroneous impression that work covered in the last two weeks of the semester is not important.

Regulation 6.6.6.1 continues to be problematic, as it again forces testing for non-pedagogical reasons, especially for senior level courses. It was suggested that exemptions from the “20% rule” could be approved by the relevant department head, rather than by the faculty undergraduate studies committee.

Joan Burry
Associate Registrar and Secretary,
Undergraduate Studies Committee,
Faculty of Science
Hi Gail,

I realized I did not count Ian's vote. Please, disregard the message that describes a count of 7 in favour. The right count is 8!

-j

JC Loredo-Osti, Professor
Department of Mathematics and Statistics Memorial University
Phone: +(709) 864 8729

"Wisdom comes to us when it can no longer do any good."
--Gabriel Garcia Marquez (Love in the time of cholera).
Hello Gail,

the reviewed Scientific Computing changes have been approved by 7 votes in favour (Brent, Kapil, Karem, Ranata, Sukhinder, Christina and myself). No votes against.

The request can now be put to the Faculty Council's consideration.

Regards,

-j

On 12/23/2014 09:33 AM, Kenny, Gail wrote:
> Hello JC,
> 
> Martin Plumer has made two changes to the document originally sent to you, one of which is to incorporate your suggestion re the thesis work. The other is to remove a redundant statement he just noticed. Both changes are in the paragraph 4.a.
> 
> Gail
>
> From: MathStat Graduate Officer [mailto:mathgrad@mun.ca]
> Sent: December-22-14 4:55 PM
> To: Kapil Tahan; Fleming, Ian; Christina Bottaro; JC Loredo-Osti;
> Todd Andrews; Kenny, Gail; Sukhinder Kaur Cheema; Len Zedel; Brent
> Snook; Ratana Chuenpagdee; Minglun Gong; Karem Azmy
> Subject: Fwd: RE: Fwd: Scientific Computing calendar changes
> 
> In the first page, 25.21.4, point (3). The current wording says '... Upon the completion of the work for the thesis or project, to be submitted to the SGS for examination, the student ...'. Course, the wording is a bit lousy, but a 'free' interpretation reads as 'thesis shall comply with SGS regulations'
> 
> The proposed wording only says that upon the completion of thesis the student is required to present a seminar and not a single statement that suggests that thesis should comply with Section 4.10 (Thesis and reports) of the SGS calendar.
> 
> Now, university specifically regulates how thesis or equivalent [for the programmes that do not call it thesis] should be evaluated and it is my understanding that how projects are evaluated is left to the individual units.
> 
> See http://www.mun.ca/sgs/go/guid_policies/theses.php
> 
> Because of it, I think they should strip the word thesis and say that the programmes has two routes: co-op and project. Otherwise, they have allude the 4.10 section of the SGS calendar.
> 
> Just my 2 cents.
> 
> -j
 Forwarded Message

Subject:

RE: Fwd: Scientific Computing calendar changes

Date:

Mon, 22 Dec 2014 19:47:53 +0000

From:

Kenny, Gail <gkenny@mun.ca>

To:

MathStat Graduate Officer <mathgrad@mun.ca>

Hello JC,

I'm not sure I understand your statement. I've re-read the document and I think, in the project option section, there is no mention of a thesis. There is nothing changed with the thesis option section either. Can you clarify for me? Thanks.

Gail

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

From: MathStat Graduate Officer <mathgrad@mun.ca>

Sent: December-22-14 4:10 PM

To: JC Loredo-Ostl; Kapil Tahlan; Fleming, Ian; Christina Bottaro;
    Todd Andrews; Kenny, Gail; Sukhinder Kaur Cheema; Len Zedel; Brent
    Snook; Ratana Chuenpagdee; Minglun Gong; Kareem Azmy

Subject: Re: Fwd: Scientific Computing calendar changes

I noticed that the new wording gives the impression that review of the thesis will not follow the University regulations. If that is the case, they should call it project and remove thesis option.
On 12/22/2014 02:32 PM, JC Loredo-Osti wrote:

>> Hello All,
>> for your consideration, attached is a file with a request for
>> calendar changes from Scientific Computing. Please, review and let me
>> know your decision at your earliest convenience.
>> j

>> ------- Forwarded Message -------
>> Subject: Scientific Computing calendar changes
>> Date: Mon, 15 Dec 2014 12:41:36 +0000
>> From: Kenny, Gail <gkenny@mun.ca><mailto:gkenny@mun.ca>
>> To: J. Loredo-Osto <jcloredoost@mun.ca><mailto:jcloredoost@mun.ca>, MathStat Graduate
>> Officer <mathgrad@mun.ca><mailto:mathgrad@mun.ca>
>> Hi JC,
>> For discussion and approval by the GS committee.
>> Gail
>> Gail Kenny
>> Dean of Science Office (C-2001)
>> Memorial University of Newfoundland
>> St. John's, NL A1B 3X7
>> gkenny@mun.ca<mailto:gkenny@mun.ca>

--
JC Loredo-Osti

Graduate Officer

Department of Mathematics and Statistics Memorial University

Phone: +(709) 864 8729

--

JC Loredo-Osti
25.21.4 Program of Study

1. The goal of Scientific Computing is to solve technical problems, in science and engineering, using computers and computational methods. Our program is designed to educate students to apply computational, numerical and programming concepts and tools to solve and model complex problems in science and engineering.

2. The Program is offered in thesis and project (non-thesis) versions, with the option of a co-operative education program. It is intended that the overall level of student effort and performance required in each version will be comparable. The normal length of time to complete each option is 24 months.

3. The work for the thesis or project will be carried out under the guidance of a supervisor (or joint supervisors). The home department of the student will be the same as that of the Supervisor. Upon completion of the work for the thesis or project, it is submitted to the School of Graduate Studies for examination; each student is required to present a seminar suitable for the Interdisciplinary audience of Scientific Computing program students.

4. All students are required to complete a minimum of 3 core courses (9 credit hours) selected from the list of Core Courses listing below. All students are also recommended to complete CMSC 6950. Additional courses are required in accordance with the program options as outlined below and will normally be selected from the student's discipline of specialization. The course requirements for each student are approved by the Program Chair on the recommendation of the student's supervisor(s), and should reflect the interdisciplinary nature of the program. Students are expected to attend research seminars in their home department as well as those relevant to Scientific Computing, when advertised.

   a. The thesis option requires the completion of a minimum of four graduate courses (12 credit hours) numbered 6000 or higher, which must include three courses (9 credit hours) from the Core Courses listing below. Equivalent courses may be considered for substitution with approval of the Program Chair. The additional course(s) will normally be chosen from the Additional Courses listing below in the same discipline as the thesis work. The submission of an acceptable thesis is required. The thesis is to contain an original scholarly contribution which must be submitted to the School of Graduate Studies for final examination. The thesis must be written in a format according to procedures outlined in Guidelines for Theses and Reports by the School of Graduate Studies (http://www.mun.ca/sqs/go/guid_policies/theses.php). Each student is also required to present a seminar on their thesis research topic that demonstrates their use of computational techniques to solve a problem in science or engineering.

   b. The project option requires the completion of a minimum of seven graduate courses (21 credit hours) numbered 6000 or higher, which must include CMSC 6009 and at least three courses (9 credit hours) from the Core Courses listing below. Equivalent courses may be considered for substitution with approval of the Program Chair. An acceptable project report is also required which must be submitted to the School of Graduate Studies for final examination. The additional courses will normally be chosen from the Additional Courses listing below in the same discipline as the project work. An acceptable project report is also required that is based on research performed with the guidance of the student's supervisor. The project, which will include an in-depth written report, shall require the equivalent of at least one and no more than two
semesters of full time work. The project report must be written in a format according to procedures outlined in Guidelines for Theses and Reports by the School of Graduate Studies (http://www.mun.ca/sgs/go/guid_policies/theses.php). The report will be evaluated by the student’s supervisor, by the Chair of the Board of Study (or delegate), as well as by one other faculty member. Acceptance of a final version of the report (and a passing grade for CMSC 6009) requires the agreement of the three examiners.

25.21.5 Co-operative Education Option

1. A co-operative education option will be available to students who are accepted into the M.Sc. program. Students in this option may follow the thesis or non-thesis version of the program. It is expected to take up to 24 months to complete.

2. Students will normally declare their intention to complete the co-operative education option at the start of the second semester of their academic program.

3. Students will complete two work terms consecutively, normally following the successful completion of two academic semesters: a minimum of four courses (12 credit hours).

4. The dates for starting and finishing each work term are shown in the University Diary.

5. A competition for work term employment is organized by the Division of Co-operative Education (DCE) in cooperation with a designated faculty member from Scientific Computing. Students may also obtain their own work term jobs outside the competition. Such jobs must be confirmed by letter from the employer and approved by the Chair of Scientific Computing and by the DCE on or before the first day of the work term. Work term jobs may be outside St. John’s and possibly outside Newfoundland and Labrador. Students who do not wish to accept a work term job arranged by DCE shall be responsible for finding an acceptable alternative. By entering the competition, students give permission for the DCE to supply their Memorial University of Newfoundland transcripts and resumes to potential employers.

6. Each work term placement will be supervised by the student’s program supervisor, the on-site supervisor assigned by the employer and the DCE Coordinator. The overall evaluation of the work term is the responsibility of the program Supervisor, on-site Supervisor, and DCE Coordinator. The work term shall consist of two components:
   - On-the-Job Student Performance as evaluated by the on-site supervisor and DCE Coordinator, in consultation with the program supervisor.
   - A Work Report graded by the DCE Coordinator and the program supervisor in consultation with the on-site supervisor.

7. Evaluation of the work term will result in the assignment of one of the following final grades:
   - Pass with Distinction: Indicates OUTSTANDING PERFORMANCE in both the work report and work performance.
   - Pass: Indicates that PERFORMANCE MEETS EXPECTATIONS in both the work report and work performance.
   - Fail: Indicates FAILING PERFORMANCE in the work report and/or the work performance. If a student fails to achieve a final grade of Pass or Pass with Distinction, and provided the student has not failed to achieve a grade of ‘B’ or better in any program course, the student may request to repeat the work term component. The request will be considered by the Chair of
Scientific Computing in consultation with the program supervisor and the DCE Coordinator. Only one repetition of a work term will be permitted in the student's program.

8. Following the completion of the two work terms, each student must complete any remaining course requirements and project report or thesis. Assuming that prior written authorization of the employer and the supervisory committee was obtained and submitted to the School of Graduate Studies, students may include material from the work terms in their reports or theses. For students following the non-thesis version of the program, the two work-term reports may be combined into a single, integrated report for this purpose. All other students must write a thesis on a research project which may be based on research completed during the work terms.

9. Students who are accepted into the co-op option are not guaranteed placements. In the event that a student fails to obtain two semesters of placements, but successfully completes all other requirements of the Degree, he or she will still be eligible for graduation, but without the designation of a co-op degree.

25.21.6 Courses

Core Courses
- Computer Science 6731 Topics in Numerical Methods
- **Mathematics 6201 Numerical Methods for Partial Differential Equations**
- Mathematics 6210 Numerical Solutions of Differential Equations
- **Scientific Computing 6009 Master's Project**
- Scientific Computing 6910 Matrix Computations and Applications or Computer Science 6732 Matrix Computations *(credit may be obtained for only one of the CMSC 6910 and COMP 6732)*
- Scientific Computing 6920 Applied Scientific Programming
- Scientific Computing 6930 Algorithms for Distributed and Shared Memory Computers
- Scientific Computing 6950 Computer Based Tools and Applications *(credit may be obtained for only one of CMSC 6950 and the former CMSC 6940)*
From: MathStat Graduate Officer <mathgrad@mun.ca>
Sent: December-23-14 3:00 PM
To: Kenny, Gail; Len Zedel
Subject: Re: COMP calendar changes December 2014

Hello Gail,

these changes have been approved by this committee with 7 votes in favour (Minglun, Kareem, Kapil, Sukhinder, Brent, Ratana and myself).
None against.

This request can now be turned to the Faculty Council for approval.

-j

On 12/02/2014 03:29 PM, Kenny, Gail wrote:
> Hi JC,
> 
> I've attached a calendar changes document from Computer Science received today. Just for information, if we can get this through the GS committee in time for the Faculty Council meeting this December, we can get them to Grad. Studies for the Academic Council meeting January. That will mean we can get the changes in the 2015-2016 calendar.
> 
> Gail
>
> Gail Kenny
> Dean of Science Office (C-2001)
> Memorial University of Newfoundland
> St. John's, NL A1B 3X7
> gkenny@mun.ca
> 
>

--
JC Loredo-Osti
Graduate Officer
Department of Mathematics and Statistics Memorial University
Phone: +(709) 864 8729

1
December 1, 2014

TO: Graduate Studies Committee, Faculty of Science

FROM: Wolfgang Banzhaf, Department Head
Department of Computer Science

SUBJECT: Calendar Changes to Graduate Programs in Computer Science

Enclosed please find calendar changes for our graduate programs. These revisions are proposed as a follow-up to the revisions submitted in October 2013.

The enclosed proposals have been recommended by our departmental Graduate Studies Committee. The courses are new or revised from offerings in the past.

The program changes were approved at our departmental meetings between February 12, 2014 and September 16, 2014.

Proposed courses include:

6900 Research Methods in Computer Science
6905 Software Engineering (credit may only be obtained for one of 6905 or 6713)
6906 Numerical Methods (credit may only be obtained for one of 6906 or 6731)
6909 Fundamentals of Computer Graphics (credit may be obtained for only one of 6909 or 6752)
6914 3D Modelling and Rendering
6918 Digital Image Processing (credit may be obtained for only one of 6918 or 6756)
6921 Syntax and Semantics of Programming Languages (credit may be obtained for only one of 6921 or 6711)
6924 Formal Grammars, Automata and Languages
6928 Knowledge-Based Systems (credit may be obtained for only one of 6928 or 6755)
6929 Advanced Computational Geometry (credit may be obtained for only one of 6929 or 6745)
6930 Theory of Databases (credit may be obtained for only one of 6930 or 6742)
6931 Matrix Computations and Applications (credit may only be obtained for one of 6931 or 6732)
6932 Matrix Computations in Control (credit may only be obtained for one of 6932 or 6738)
Courses to be removed include:

6711 Syntax and Semantics of Programming Languages
6713 Software Engineering
6731 Topics in Numerical Methods
6732 Matrix Computations
6738-6739 Special Topics in Numerical Methods
6742 Theory of Databases
6745 Special Topics - Advanced Computational Geometry
6752 Applications of Computer Graphics
6755 Knowledge-Based Systems
6756 Digital Image Processing

Courses remaining include:

601W Work Term
6758-6769 Special Topics in Computer Applications
6770-6790 Special Topics in Computer Science (excluding 6783)
6901 Applied Algorithms (credit may be obtained for only one of 6901 and 6783)
6902 Computational Complexity (credit may be obtained for only one of 6902 and 6743)
6903 Concurrent Computing
6904 Advanced Computer Architecture (credit may be obtained for only one of 6904 and 6722)
6907 Introduction to Data Mining (credit may be obtained for only one of 6907 and 6762)
6908 Database Technology and Applications (credit may be obtained for only one of 6908 and 6751)
6910 Services Computing, Semantic Web and Cloud Computing
6911 Bio-inspired Computing
6912 Autonomous Robotics (credit may be obtained for only one of 6912 and 6778)
6913 Bioinformatics
6915 Machine Learning
6916 Security and Privacy
6922 Compiling Methods (credit may be obtained for only one of 6922 and 6712)
6925 Advanced Operating Systems
6926 Performance Evaluation of Computer Systems
6999 Master's Project

In addition, changes to Regulation 25.10.2 are enclosed. Rationale:

- The research forum presentation requirement is removed for course-based M.Sc. students, and now only applies to thesis-based students. In many cases, the course-based M.Sc. students are out-of-town for their work terms when the forum is held. As a replacement, a seminar presentation is required for course-based M.Sc. students who have completed their project (COMP-6999 Master’s Project).
- The requirement for an Information Systems course is removed because this course is not considered as essential to their program.

- Students are required to take at least one more course after their work term to prevent them from using their jobs to fulfill the work term requirement.

- Wording regarding the "Division of Co-operative Education Coordinator" has been changed to "Academic Staff Member in Co-operative Education" to reflect the administrative change in Co-operative Education.

Should you have any questions, please do not hesitate to contact me.

Wolfgang Banzhaf

/re

Enclosures
DEPARTMENT OF COMPUTER SCIENCE
Proposed Changes for 2015-2016 University Calendar

The following excerpts are from the 2014-2015 University Calendar:

Revisions are noted in strikeout text, and changes and additions noted in **underlined-bold** text.

Pages 618-619

25.10.4 Courses

601W Work Term
6711 Syntax and Semantics of Programming Languages
6713 Software Engineering
6731 Topics in Numerical Methods
6732 Matrix Computations
6738-6739 Special Topics in Numerical Methods
6742 Theory of Databases
6745 Special Topics - Advanced Computational Geometry
6752 Applications of Computer Graphics
6755 Knowledge-Based Systems
6756 Digital Image Processing
6758-6769 Special Topics in Computer Applications
6770-6790 Special Topics in Computer Science (excluding 6783)

**6900 Research Methods in Computer Science**
6901 Applied Algorithms (credit may be obtained for only one of 6901 and 6783)
6902 Computational Complexity (credit may be obtained for only one of 6902 and 6743)
6903 Concurrent Computing
6904 Advanced Computer Architecture (credit may be obtained for only one of 6904 and 6722)

**6905 Software Engineering (credit may only be obtained for one of 6905 or 6713)**
6906 Numerical Methods (credit may only be obtained for one of 6906 or 6731)
6907 Introduction to Data Mining (credit may be obtained for only one of 6907 and 6762)
6908 Database Technology and Applications (credit may be obtained for only one of 6908 and 6751)

**6909 Fundamentals of Computer Graphics (credit may be obtained for only one of 6909 or 6752)**
6910 Services Computing, Semantic Web and Cloud Computing
6911 Bio-inspired Computing
6912 Autonomous Robotics (credit may be obtained for only one of 6912 and 6778)
6913 Bioinformatics

**6914 3D Modelling and Rendering**
6915 Machine Learning
6916 Security and Privacy

**6918 Digital Image Processing (credit may be obtained for only one of 6918 or 6756)**
6921 Syntax and Semantics of Programming Languages (credit may be obtained for only one of 6921 or 6711)
6922 Compiling Methods (credit may be obtained for only one of 6922 and 6712)
6924 Formal Grammars, Automata and Languages
6925 Advanced Operating Systems
6926 Performance Evaluation of Computer Systems
6928 Knowledge-Based Systems (credit may be obtained for only one of 6928 or 6755)
6929 Advanced Computational Geometry (credit may be obtained for only one of 6929 or 6745)
6930 Theory of Databases (credit may be obtained for only one of 6930 or 6742)
6931 Matrix Computations and Applications (credit may only be obtained for one of 6931 or 6732)
6932 Matrix Computations in Control (credit may only be obtained for one of 6932 or 6738)
6999 Master’s Project

Page 646

31.7.2 Courses

6711 Syntax and Semantics of Programming Languages
6713 Software Engineering-
6731 Topics in Numerical Methods
6732 Matrix Computations-
6738-6739 Special Topics in Numerical Methods
6742 Theory of Databases-
6745 Special Topics - Advanced Computational Geometry-
6752 Applications of Computer Graphics
6755 Knowledge-Based Systems-
6756 Digital Image Processing-
6758-6769 Special Topics in Computer Applications
6770-6790 Special Topics in Computer Science (excluding 6783)-
6900 Research Methods in Computer Science
6901 Applied Algorithms (credit may be obtained for only one of 6901 and 6783)
6902 Computational Complexity (credit may be obtained for only one of 6902 and 6743)
6903 Concurrent Computing
6904 Advanced Computer Architecture (credit may be obtained for only one of 6904 and 6722)
6905 Software Engineering (credit may only be obtained for one of 6905 or 6713)
6906 Numerical Methods (credit may only be obtained for one of 6906 or 6731)
6907 Introduction to Data Mining (credit may be obtained for only one of 6907 and 6762)
6908 Database Technology and Applications (credit may be obtained for only one of 6908 and 6751)
6909 Fundamentals of Computer Graphics (credit may be obtained for only one of 6909 or 6752)
6910 Services Computing, Semantic Web and Cloud Computing
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6914 3D Modelling and Rendering
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6918 Digital Image Processing *(credit may be obtained for only one of 6918 or 6756)*
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6930 Theory of Databases *(credit may be obtained for only one of 6930 or 6742)*
6931 Matrix Computations and Applications *(credit may only be obtained for one of 6931 or 6732)*
6932 Matrix Computations in Control *(credit may only be obtained for one of 6932 or 6738)*
6999 Master’s Project
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.: COMP 6900

Course Title: Research Methods in Computer Science

I. To be completed for all requests:

A. Course Type: ✔ Lecture course ☐ Laboratory course ☐ Directed readings
   ☐ Lecture course with laboratory ☐ Undergraduate course 1
   ☐ Other (please specify) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 18 x 2 semester

F. Course description (reading list required):
   This course introduces basic skills required for conducting research in Computer Science, such as data analysis tools, peer review guidelines, technical writing and presentation. It also offers training on creative thinking and problem-solving skills. To learn the skills hands on, each student is required to work on an individual course project throughout the course, starting from surveying the literature to proposing a topic to finishing a report and presenting it to the department.

G. Method of evaluation:

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<th>Written</th>
<th>Percentage</th>
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<td>10</td>
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<tr>
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<td>Total</td>
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</tr>
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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____

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

[Signature]
Course instructor

[Signature]
Approval of the head of the academic unit

Nov 25, 2014
Date

[Signature]
Nov 25, 2014
Date

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

[Signature]
Secretary, Faculty/School/Council

Date

Updated October 2011
COMP 6900

Research Methods in Computer Science

Course objectives / description

This course introduces basic skills required for conducting research in Computer Science, such as data analysis tools, peer review guidelines, technical writing and presentation. It also offers training on creative thinking and problem-solving skills. To learn the skills hands on, each student is required to work on an individual course project throughout the course, starting from surveying the literature to proposing a topic to finishing a report and presenting it to the department.

Course outline

- Creative thinking and problem-solving skills
- Effective literature search
- Topic selection and validation
- Technical writing guidelines
- Peer review
- Collaborative writing tools
- Data processing, analysis, and presentation tools
- Effective presentation

Prerequisites / background required

N/A

Evaluation

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</tr>
<tr>
<td>Forum presentation</td>
<td>10%</td>
</tr>
</tbody>
</table>

References / reading list

- C. A. Shaffer, Experiences teaching a graduate research methods course, ACM SIGCSE Bulletin, Volume 38, Issue 2, June 2006
- Original research papers on selected topics.
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.: COMP 6905 (credit restricted with COMP 6713)

Course Title: Software Engineering

I. To be completed for all requests:

A. Course Type:
   - ☑ Lecture course
   - ☐ Laboratory course
   - ☐ Directed readings
   - ☐ Lecture course with laboratory
   - ☐ Undergraduate course
   - ☐ 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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   
   See attached

G. Method of evaluation:

<table>
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<th></th>
<th>Written</th>
<th>Percentage</th>
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</thead>
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<tr>
<td>Total</td>
<td>100</td>
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</tr>
</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>
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</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 20

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

Course instructor: ____________________________

Date: Nov 28, 2014

Approval of the head of the academic unit: ____________________________

Date: Nov 28, 2014

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

Secretary, Faculty/School/Council: ____________________________

Date: ____________________________

Updated October 2011
COMP 6905
Software Engineering

Course objectives / description

The techniques to formally specify software, transforming the formal specification to architecture, and then implementation are the main topics of this course. Some techniques can include UML and OCL, Z, Object-Z, Alloy, Design Patterns, CASE tools, verification, and testing.

Representative outline

- Requirements elicitation
- Modelling/Analysis
- System Design
- Object Design
- Design Patterns
- Testing

Prerequisites / background required

Completion of an undergraduate course in Software Engineering.

Evaluation

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<th>30 %</th>
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<td>Midterm</td>
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</tr>
<tr>
<td>Project</td>
<td>35 %</td>
</tr>
</tbody>
</table>

References / reading list

Request for Approval of a Graduate Course

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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.: COMP 6906 (credit restricted with COMP 6731)

Course Title: Numerical Methods

I. To be completed for all requests:

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

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   The development of algorithms for the numerical solution of selected mathematical problems, and the study of the numerical stability of some of these algorithms are the main objectives of this course. The efficiency of these algorithms with respect to speed (of computation and data communication) and storage requirements is considered as well. Emphasis will also be placed on the study of the sensitivity of selected problems to perturbations in the data.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Class tests</td>
<td>10% + 15%</td>
</tr>
<tr>
<td>Assignments</td>
<td>40%</td>
</tr>
<tr>
<td>Other (specify): Project</td>
<td>20% + 10%</td>
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<tr>
<td>Final examination:</td>
<td>5%</td>
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Total 70% 30%

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____

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

Signed: [Signature]

Course instructor [Dec. 28, 2014]

Approval of the head of the academic unit

Signed: [Signature]

[Nov 28, 2014]

Date

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

Signed: [Signature]

Secretary, Faculty/School/Council

[Date]

Updated October 2011
COMP 6906

Numerical Methods

Course objectives / description

The development of algorithms for the numerical solution of selected mathematical problems, and the study of the numerical stability of some of these algorithms are the main objectives of this course. The efficiency of these algorithms with respect to speed (of computation and data communication) and storage requirements is considered as well. Emphasis will also be placed on the study of the sensitivity of selected problems to perturbations in the data.

Course outline (topics will be chosen from the following list)

- Computer arithmetic (floating point arithmetic)
- Norms, conditioning of problems and stability of algorithms
- Linear systems of equations
- Interpolation, approximation
- Numerical integration
- Numerical solution of nonlinear equations
- Ordinary differential equations
- Introduction to numerical algorithms for parallel and vector architectures

Prerequisites / background required

Knowledge in Linear Algebra (equivalent to Mathematics 2051) and calculus is required.

Evaluation

<table>
<thead>
<tr>
<th>Assignment</th>
<th>40 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>20 %</td>
</tr>
<tr>
<td>Project presentation plus questions on entire course material</td>
<td>10 % + 15%</td>
</tr>
<tr>
<td>Project proposal</td>
<td>10 %</td>
</tr>
<tr>
<td>In-class participation</td>
<td>5 %</td>
</tr>
</tbody>
</table>

Textbook

References / reading list

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 (Bruno 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.: COMP 6909 (credit restricted with COMP 6752)

Course Title: Fundamentals of Computer Graphics

I. To be completed for all requests:

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

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   This course introduces the students to the fundamental concepts of computer graphics and their applications. The underlying algorithms, as well as the basic techniques to develop them, are presented. Topics of the course include 2D raster graphics, image warping and morphing, geometrical transformations, 3D modeling and rendering.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Percentage</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class tests</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Assignments</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Other (specify): Project</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>Final examination:</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>90%</td>
<td>10%</td>
</tr>
</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:

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  200_ 

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

Course instructor  
Nov 25, 2014  
Date

Approval of the head of the academic unit

Nov 28, 2014  
Date

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

Secretary, Faculty/School/Council  
Updated October 2011  
Date
COMP 6909

Fundamentals of Computer Graphics

Course objectives / description

This course introduces the students to the fundamental concepts of computer graphics and their applications. The underlying algorithms, as well as the basic techniques to develop them, are presented. Topics of the course include 2D raster graphics, image warping and morphing, geometrical transformations, 3D modeling and rendering.

Course outline

- Introduction
- Raster graphics: line generation, circle generation, line clipping, polygon filling
- Image warping and morphing
- Geometrical transformations
- 3D modeling: geometric primitives, parametric curve and surface, solid modeling
- 3D rendering: visibility determination, illumination model, texture mapping, anti-aliasing

Prerequisites / background required

Knowledge with linear algebra concepts is required. Proficiency in programming is also expected.

Evaluation

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>40 %</td>
</tr>
<tr>
<td>Term exam</td>
<td>20 %</td>
</tr>
<tr>
<td>Project/Presentation</td>
<td>40 %</td>
</tr>
</tbody>
</table>

References / reading list

- Fundamentals of Computer Graphics by Peter Shirley, Michael Ashikhmin and Steve Marschner (Jul 21 2009)
- Original research papers on selected topics.
Request for Approval of a Graduate Course

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

Course No.: COMP 6914
Course Title: 3D Modeling and Rendering

I. To be completed for all requests:

A. Course Type: [✓] Lecture course [ ] Laboratory course [ ] Undergraduate course 1
[ ] Directed readings [ ] Other (please specify) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
Starting with a brief introduction on the fundamental knowledge of 3D computer graphics, this course focuses on recent advances on modeling and rendering techniques. The part on modeling covers both mesh-based and point-based model creation approaches, as well as image-based modeling algorithms. The topics on rendering include both photorealistic, and non-photorealistic, and image-based rendering.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Percentage</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class tests</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Assignments</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Other (specify): Project</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>Final examination:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>90%</td>
<td>10%</td>
</tr>
</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:

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___

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

[Signatures]

Course instructor

[Date]

Approval of the head of the academic unit

[Signatures]

[Date]

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

[Signatures]

Secretary, Faculty/School/Council

[Date]

Updated October 2011
COMP 6914

3D Modeling and Rendering

Course objectives / description

Starting with a brief introduction on the fundamental knowledge of 3D computer graphics, this course focuses on recent advances on modeling and rendering techniques. The part on modeling covers both mesh-based and point-based model creation approaches, as well as image-based modeling algorithms. The topics on rendering include both photorealistic, and non-photorealistic, and image-based rendering.

Course outline

- Introduction
- Mesh-based modeling: marching cubes
- Point-based modeling: point set surface, point set skeletisation
- Image-based modeling: interactive architecture modeling, image-based visual hull
- Photorealistic rendering: ray tracing, photon mapping, radiosity rendering, precomputed radiance transfer;
- Non-photorealistic rendering: cartoon rendering, silhouette rendering, stippling;
- Image-based rendering: panoramic mosaicing, view-dependent texture, light field rendering, depth-based warping;

Prerequisites / background required

This course is offered to students with a basic knowledge in computer graphics. Proficiency in programming is also required.

Evaluation

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
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<tr>
<td>Term exam</td>
<td>20 %</td>
</tr>
<tr>
<td>Project/Presentation</td>
<td>40 %</td>
</tr>
</tbody>
</table>

References / reading list


• Original research papers on selected topics.
Request for Approval of a Graduate Course

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School of Graduate Studies: Memorial University of Newfoundland; LRC-2012 (Bruno Centre for Research and Innovation); St. John's, NL A1C 5S7 Canada Fax: 709.739.3683 eMail: sgss@mun.ca

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

Course No.: COMP 6918 (credit restricted with COMP 6756)

Course Title: Digital Image Processing

I. To be completed for all requests:

A. Course Type:
   - [ ] Lecture course
   - [ ] Laboratory course
   - [ ] Directed readings
   - [ ] Lecture course with laboratory
   - [ ] Undergraduate course
   - [ ] Other (please specify) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   This course introduces the fundamental techniques for digital image processing. Topics include image enhancement using various spatial and frequency domain filters, morphological operations for binary images, and image restoration algorithms. Image analysis techniques such as edge detection and image segmentation are also discussed.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Class tests</td>
<td>20%</td>
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<tr>
<td>Assignments</td>
<td>40%</td>
</tr>
<tr>
<td>Other (specify): Project</td>
<td>30%</td>
</tr>
<tr>
<td>Final examination:</td>
<td>10%</td>
</tr>
</tbody>
</table>

   Total 90% 10%

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__

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

Course instructor

Date

Approval of the head of the academic unit

Date

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

Secretary, Faculty/School/Council

Date

Updated October 2011
COMP 6918
Digital Image Processing

Course objectives / description

This course introduces the fundamental techniques for digital image processing. Topics include image enhancement using various spatial and frequency domain filters, morphological operations for binary images, and image restoration algorithms. Image analysis techniques such as edge detection and image segmentation are also discussed.

Course outline

- Introduction
- Spatial domain image filtering: linear and non-linear filters, image blurring and sharpening
- Frequency domain image filtering: convolution, 2D discrete Fourier transform
- Image restoration
- Morphological image processing
- Edge detection
- Image segmentation: thresholding, region based segmentation,

Prerequisites / background required

Proficiency in programming is required. Knowledge with calculus and linear algebra concepts are also expected.

Evaluation

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>40 %</td>
</tr>
<tr>
<td>Term exam</td>
<td>20 %</td>
</tr>
<tr>
<td>Project/Presentation</td>
<td>40 %</td>
</tr>
</tbody>
</table>

References / reading list

- Original research papers on selected topics.
Request for Approval of a Graduate Course

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

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

Course No.: COMP 6921 (credit restricted with COMP 6711)
Course Title: Syntax and Semantics of Programming Languages

I. To be completed for all requests:

A. Course Type:
   ☑ Lecture course
   ☐ Laboratory course
   ☐ Directed readings
   ☐ Lecture course with laboratory
   ☐ Undergraduate course
   ☐ 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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   The objective of the course is to develop a mathematical understanding of programming language syntax and semantics. The relationship between these two components is captured as an algebraic one between the same kind of mathematical structures. Students interested in programming languages will have the opportunity to substantially broaden their knowledge acquired at the undergraduate level by taking this course.

G. Method of evaluation:
   
   Written  Percentage  Oral
   Class tests  25%  
   Assignments  25%  
   Other (specify):
   Final examination: 50%
   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___

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

_______________________________  Nov. 28/14  ____________________________  Nov. 28, 2014
Course Instructor              Date

_______________________________  ____________________________
Approval of the head of the academic unit  Date

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

_______________________________  ____________________________
Secretary, Faculty/School/Council  Date

Updated October 2011
COMP 6921
Syntax and Semantics of Programming Languages

Course objectives / description
The objective of the course is to develop a mathematical understanding of programming language syntax and semantics. The relationship between these two components is captured as an algebraic one between the same kind of mathematical structures. Students interested in programming languages will have the opportunity to substantially broaden their undergraduate level knowledge by taking this course.

Course outline:

- An overview of syntax: basics of context-free languages
- Translational semantics: attribute grammars
- Operational semantics
- Denotational semantics
- Domains, fixed-point theory
- Basics of category theory
- The construction of a universal domain
- Axiomatic semantics: program verification

Prerequisites / background required
Students who have taken a course on compiler design are best prepared for the course. A basic understanding of the structure of syntax and semantics is, however, also sufficient as a minimum requirement.

Evaluation

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
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</tr>
<tr>
<td>Midterm examination</td>
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</tr>
<tr>
<td>Final examination</td>
<td>50%</td>
</tr>
</tbody>
</table>
Textbook


References / reading list


H. Simmons: An Introduction to Category Theory; Cambridge University Press, 2011.


S. Mac Lane: Categories for the Working Mathematician (second edition); Springer Verlag, 1998.
Request for Approval of a Graduate Course

Adobe Reader, minimum version 6, 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 (Brunoe 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.: COMP 8924

Course Title: Formal grammars, automata and languages

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):

See attached

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class tests</td>
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<td>Final examination:</td>
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<tr>
<td>Total</td>
<td>100</td>
</tr>
</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:

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____

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

W. M. Johnson

Course Instructor

Approval of the head of the academic unit

Nov 28, 2014

Date

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

Secretary, Faculty/School/Council

Date

Updated October 2011
COMP 6924: Formal grammars, automata and languages

Objectives: To introduce basic concepts of formal languages, formal grammars and finite-state automata, to study general properties of different classes of formal languages, and to discuss their practical use in programming languages, compiler design, design of algorithms, etc.

The course is available to senior undergraduate students (with the permission of the Head of the Department).

Background: Familiarity with discrete mathematics is required.

Evaluation:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>25 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td>25 %</td>
</tr>
<tr>
<td>Final examination</td>
<td>50 %</td>
</tr>
</tbody>
</table>

Outline:

- Basic concepts, alphabets, strings and languages, finite definitions of infinite languages
- Formal grammars and their languages
- Finite automata, regular grammars and regular expressions
- Pushdown automata and context-free grammars
- Turing machines and unrestricted grammars
- Applications

References:

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: ses@mun.ca

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

Course No.: COMP 6928 (credit restricted with COMP 6755)

Course Title: Knowledge-Based Systems

I. To be completed for all requests:

A. Course Type:

☑ Lecture course
☐ Laboratory course
☐ Directed readings
☐ Lecture course with laboratory
☐ Undergraduate course
☐ Other (please specify) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):

This course provides students the major ideas of artificial intelligence and knowledge-based systems so that they will understand and be able to implement knowledge-based systems. The topics include introduction of knowledge-based systems, automated reasoning, PROLOG programming language, problem solvers, knowledge representations and organization, uncertainty reasoning, knowledge-based system development, and multi-agent systems.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Class tests</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written</td>
<td>40%</td>
</tr>
<tr>
<td>Oral</td>
<td></td>
</tr>
</tbody>
</table>

Assignments 30%

Other (specify): Project 30%

Final examination 30%

Total 100%

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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___

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

______________________________  ____________________
Course Instructor            Dec. 1, 2014

______________________________  ____________________
Approval of the head of the academic unit
Date            Dec. 1, 2014

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

______________________________  ____________________
Secretary, Faculty/School/Council
Date

Updated October 2011
Computer Science 6928
Knowledge-Based Systems

Course objectives / description

This course provides students the major ideas of artificial intelligence and knowledge-based systems so that they will understand and be able to implement knowledge-based systems. The topics include introduction of knowledge-based systems, automated reasoning, PROLOG programming language, problem solvers, knowledge representations and organization, uncertainty reasoning, knowledge-based system development, and multi-agent systems.

Course outline:

- Introduction to AI and knowledge-based systems
- Predicate calculus, unification, Automated reasoning: resolution
- Searching, Heuristic search
- Prolog
- Problem solvers
- Architectures and components of Knowledge-based system
- Uncertainty and Fuzzy reasoning
- Fuzzy reasoning
- Knowledge representations
- Knowledge Organization
- Knowledge-based system development, tools
- Multi-agent systems
- Project presentation

Prerequisites/background required

Knowledge on logic, logic reasoning, and PROLOG programming language is required.

Evaluation:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment #1</td>
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<tr>
<td>Assignment #2</td>
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<tr>
<td>Assignment #3</td>
<td>10%</td>
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<tr>
<td>Assignment #4</td>
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<tr>
<td>Term Project / Presentation</td>
<td>30%</td>
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<tr>
<td>Final exam</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>
Students must complete the term project and presentation.

Format:
Lectures, three hours per week.

Textbook:

References:
C) Selected research papers
D) Class notes
Request for Approval of a Graduate Course

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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.: COMP 6929 (credit restricted with COMP 6745)

Course Title: Advanced Computational Geometry

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) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   This course introduces advanced problems related to Computational Geometry. Geometric problems arising from many applications such as Graphics, Graph Drawing, will be discussed. The corresponding algorithms for solving these problems and the complexities of these algorithms will be analyzed. The major techniques for attacking geometric problems are reviewed. Some open problems will be discussed.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class tests</td>
<td>30%</td>
</tr>
<tr>
<td>Assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Other (specify): Project</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</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:

1. duplication of thesis work ____________________________
   Instructor's initials

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____

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

   C. A. Way   Nov. 26, 2014
   ____________________________  Date
   Course Instructor

   W. B. ________________  Nov. 28, 2014
   ____________________________  Date
   Approval of the head of the academic unit

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

   ____________________________  Date
   Secretary, Faculty/School/Council

   Updated October 2011
COMP 6929
Advanced Computational Geometry

Course objectives / description

This course introduces advanced problems related to Computational Geometry. Geometric problems arising from many applications such as Graphics, Graph Drawing, will be discussed. The corresponding algorithms for solving these problems and the complexities of these algorithms will be analyzed. The major techniques for attacking geometric problems are reviewed. Some open problems will be discussed.

Course outline

- Convex hulls (Multi-dimensional convex hull).
- Voronoi diagram (Different types of the diagrams).
- Triangulation (Constrained Triangulations).
- Arrangements (Line and hyperplane arrangement).
- Linear Programming.
- Randomized algorithms on selected topics.

Prerequisites / background required

Knowledge of data structures and algorithm design is required.

Evaluation

<table>
<thead>
<tr>
<th>Assignment</th>
<th>30 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term exam</td>
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</tr>
<tr>
<td>Project/Presentation</td>
<td>40 %</td>
</tr>
</tbody>
</table>

References / read

- Some research papers from related Journals.
• My lecture notes.
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.: COMP 6930 (credit restricted with COMP 6742)

Course Title: Theory of Databases

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) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):

This course will cover several topics related to transactional aspects in centralized and distributed database systems, and in advanced database applications: multidatabase systems, cooperative information systems, workflow management systems, Web services, electronic contracts, mobile applications and cloud computing.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Written</th>
<th>Percentage</th>
<th>Oral</th>
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</thead>
<tbody>
<tr>
<td>Class tests</td>
<td>20%</td>
<td></td>
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<tr>
<td>Assignments</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Other (specify): Project</td>
<td>40%</td>
<td></td>
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<tr>
<td>Final examination:</td>
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</tbody>
</table>

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____

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

K. Vidyasagar  
Course instructor  

Date  
Nov. 28, 2014

Approval of the head of the academic unit

Date  
Nov 28, 2014

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

Secretary, Faculty/School/Council  

Date  

Updated October 2011
COMP 6930
Theory of Databases

OBJECTIVES

The course will cover several topics related to transactional aspects in centralized and distributed database systems, and advanced database applications: multidatabase systems, cooperative information systems, workflow management systems, Web services, electronic contracts, mobile applications and cloud computing.

GRADING SCHEME

Assignments (4 - 6) – 40%
Mid-term Exam – 20%
Project – 40%

REPRESENTATIVE COURSE OUTLINE

• Serializability theory: Review of the basic theory, multiversion serializability, semantic serializability, relative atomicity, relative serializability, etc.

• Concurrency control methods: Two phase locking, timestamp and optimistic methods, tree locking.

• Crash recovery: Redo, undo algorithms.

• Transaction models: Sagas, nested transactions, multilevel transactions, cooperative transactions, long-running activities, flexible transactions, transaction restructuring (split and join operations), transactional processes.

• Distributed transactions: Two-phase and three-phase commit protocols.

• Multidatabase systems: Local autonomy, interoperability, global transactions, compensation.
- Transactional workflows: Specification of tasks, task coordination and atomicity requirements, execution of workflows, correctness criteria for concurrent execution.
- Transactional aspects in Web services, electronic contracts, mobile applications and cloud computing.
- Other selected topics (e.g. concurrent operations on dynamic search structures).

REFERENCES


   (can be downloaded from http://research.microsoft.com/pubs/ccontrol)


8. Several research papers.
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.: COMP 6931 (credit restricted with COMP 6732)

Course Title: Matrix Computations and Applications

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) Project

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
The course is an introduction to the techniques of Numerical Linear Algebra. Emphasis is placed upon developing the most recent and reliable numerical algorithms. The Numerical Stability of selected algorithms as well as the Sensitivity (Conditioning) of selected problems will be studied. Students in any discipline who are interested in studying, as well as developing efficient numerical solutions of problems that originate in linear algebra should find this course interesting.

G. Method of evaluation:

<table>
<thead>
<tr>
<th></th>
<th>Written</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class tests</td>
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<td>10% + 15%</td>
</tr>
<tr>
<td>Assignments</td>
<td>40%</td>
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<tr>
<td>Other (specify): Project</td>
<td>20% +10%</td>
<td>5%</td>
</tr>
<tr>
<td>Final examination:</td>
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</tbody>
</table>

Total 70% 30%

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____

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

Course Instructor

[Signature]

Date

Dec. 28, 2014

 Approval of the head of the academic unit

[Signature]

Date

Nov 28, 2014

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

[Signature]

Date

Secretary, Faculty/School/Council

Updated October 2011
COMP 6931

Matrix Computations and Applications

Course objectives / description

The course is an introduction to the techniques of Numerical Linear Algebra. Emphasis is placed upon developing the most recent and reliable numerical algorithms. The Numerical Stability of selected algorithms as well as the Sensitivity (Conditioning) of selected problems will be studied. Students in any discipline who are interested in studying, as well as developing efficient numerical solutions of problems that originate in linear algebra should find this course interesting. Matrix Computations (or Numerical Linear Algebra) may be found useful in areas such as Control Engineering, Signal Processing, Statistics, Linear and nonlinear Optimization, as well as in most of the areas of Computational Sciences and Engineering.

Course outline

- An introduction to essential topics of Linear Algebra (If necessary)
- Systems of Linear Equations
- The QR Decomposition and the Linear Least Squares Problem
- The Eigenvalue Problem
- The Singular Value Decomposition
- Applications of Matrix Computations in Control Theory
- Introduction to Parallel Matrix Computations (If time permits)

Prerequisites / background required

Students that have taken an introductory course in Numerical Methods are well prepared for this course. Although an Introduction of necessary Linear Algebra concepts may be given, good knowledge of the subject will be very helpful.

Evaluation

<table>
<thead>
<tr>
<th>Assignment</th>
<th>40 %</th>
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<tbody>
<tr>
<td>Project</td>
<td>20 %</td>
</tr>
<tr>
<td>Project presentation plus questions on entire course material</td>
<td>10 % + 15%</td>
</tr>
<tr>
<td>Project proposal</td>
<td>10 %</td>
</tr>
<tr>
<td>In-class participation</td>
<td>5 %</td>
</tr>
</tbody>
</table>
Textbook


References / reading list

Request for Approval of a Graduate Course

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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.: COMP 6932 (credit-restricted with COMP 6738)
Course Title: Matrix Computations in Control

I. To be completed for all requests:

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

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. Credit hours for this course: 3

E. Estimated number of contact hours per semester: 36

F. Course description (reading list required):
   The course will focus on how to apply Scientific Computing in Control Theory. More specifically Matrix Computations techniques will be applied to Control problems that are governed by Linear Time-Invariant, Finite Dimensional Systems. Students from Mathematics, Computational Sciences, Computer Science and especially Electrical and Mechanical Engineering will experience how Numerically Efficient algorithms solve selected Control Theory problems.

G. Method of evaluation:

<table>
<thead>
<tr>
<th>Method</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Written</td>
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<td>Assignments</td>
<td>40%</td>
</tr>
<tr>
<td>Other (specify):</td>
<td>20% + 10%</td>
</tr>
<tr>
<td>Project</td>
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<tr>
<td>Final examination:</td>
<td>70%</td>
</tr>
<tr>
<td>Total</td>
<td>30%</td>
</tr>
</tbody>
</table>

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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□□□□

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

Date

Course Instructor

Approval of the head of the academic unit

Date

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

Secretary, Faculty/School/Council

Date

Updated October 2011
COMP 6932

Matrix Computations in Control

Course objectives / description

The course will focus on how to apply Scientific Computing in Control Theory. More specifically, Matrix Computations techniques will be applied to Control problems that are governed by Linear Time-Invariant, Finite Dimensional Systems.

Students from Mathematics, Computational Sciences, Computer Science and especially Electrical and Mechanical Engineering will experience how Numerically Efficient algorithms solve selected Control Theory problems.

An algorithm will be considered Numerically efficient when it has successfully addressed, the issues of Rounding Errors due to Floating Point Arithmetic as well as Memory and Data Flow requirements in relation to Computer Architectures.

Course outline

- Introduction of appropriate concepts
- Identification
- State Space Analysis
- State Space Design
- Kalman Filtering

Prerequisites / background required

The course assumes a strong background in Linear Algebra and Matrix Computations. The ability to Program on Conventional Architectures is also required. No background in Control Theory is assumed; an appropriate introduction to it will be given.

Evaluation

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>40 %</td>
</tr>
<tr>
<td>Project</td>
<td>20 %</td>
</tr>
<tr>
<td>Project presentation and questions on entire course material</td>
<td>10 % + 15%</td>
</tr>
<tr>
<td>Project proposal</td>
<td>10 %</td>
</tr>
<tr>
<td>In-class participation</td>
<td>5 %</td>
</tr>
</tbody>
</table>

Textbook (if applicable)

References / reading list

DEPARTMENT OF COMPUTER SCIENCE
Proposed Changes for 2015-2016 University Calendar

25.10.2 Programs

25.10.2.1 Option 1 - Thesis Route

1. Candidates are required to complete a minimum of 15 credit hours in graduate program courses, 9 of which must be in Computer Science (excluding COMP 601W and COMP 6999).

2. Full-time students are expected to complete their course work within their first year of studies. Part-time students are expected to complete their course work by the end of the seventh semester in their program.

3. Candidates must participate in the Research Forum at least once during their program. The Student Research Forum is organized by the Department of Computer Science and takes place in the Winter term of each academic year.

4. Each candidate is required to submit an acceptable thesis. The thesis project may involve a theoretical investigation and/or the development of an original, practical system. Each candidate is required to present a tentative outline of his/her proposed research to the Supervisor, with a copy to the Department Committee on Graduate Studies, by the end of his/her third semester in the program (sixth semester for part-time students). A fifteen minute oral presentation of the proposal is to be scheduled and given within four weeks of the submission date.

4.5. Prior to submission of a thesis, normally in the last semester of the program, candidates are required to present a seminar on the thesis topic, methods employed, and research results.

25.10.2.2 Option 2 - Course/Project Route with Work Term

1. Candidates are required to complete a minimum of 24 credit hours in graduate program courses, of which at least 18 credit hours must be in Computer Science.
2. Within this credit requirement, a student must take the following courses:

COMP 6999 (Master’s Project)
One course in Software Engineering (COMP 6713) (COMP-6905)
One course in Algorithms (COMP 6743 or COMP 6783) (COMP-6901 or COMP-6902)
One course in Information Systems (COMP 6742 or COMP 6751)

3. Additionally students must are required to complete one co-operative education work term (COMP 601W). Under normal circumstances, students will undertake their work term in the Spring semester. The work term is a full-time, paid work experience with one employer and either a four or eight months in duration. The work term should start in the third semester of the program. The work term can be deferred to the fourth semester, but normally only in the event of an unsuccessful job search for the third semester.

4. The dates for starting and finishing each work term are shown in the University Diary.

5. Students must successfully complete at least 12 credit hours (four courses) prior to beginning their work term. Students must have at least one required course remaining after their work term.

6. Students will conduct job searches through with the Division of Co-operative Education an Academic Staff Member in Co-operative Education in cooperation with the Department of Computer Science. It is the student’s responsibility to seek and obtain a work term placement and to communicate with all parties both within the university and beyond in a professional manner. Work term placements cannot be guaranteed by the Department of Computer Science or an Academic Staff Member in Co-operative Education, although every effort will be made to assist students in their job search. Students who do not wish to accept a work term job arranged by the Division shall be responsible for finding an alternative. Such jobs Work term placements obtained outside the job competition must be confirmed by letter from the employer and approved by the Head of Computer Science and by the Division an Academic Staff Member in Co-operative Education on or before the first day of the work term. Work term jobs placements may be outside St. John’s and possibly outside Newfoundland and Labrador.

Page 2 of 4
7. Each work term placement will be supervised by the candidate’s program Supervisor, the on-site Supervisor assigned by the employer and the Division of Co-operative Education the Academic Staff Member in Co-operative Education. The overall evaluation of the work term is the responsibility of the program Supervisor, on-site Supervisor and the Division of Co-operative Education the Academic Staff Member in Co-operative Education. The work term shall consist of two components:

a. On-the-job Student Performance as evaluated by the on-site Supervisor and the Division of Co-operative Education the Academic Staff Member in Co-operative Education, in consultation with the program Supervisor.

b. A Work Report graded by the program Supervisor in consultation with the on-site Supervisor.

8. Evaluation of the work term will result in the assignment of one of the following final grades:

a. **Pass with Distinction**: indicates outstanding performance in both the work report and work performance.

b. **Pass**: Indicates that PERFORMANCE MEETS EXPECTATIONS in both the work report and work performance.

c. **Fail**: Indicates FAILING PERFORMANCE in the work report and/or the work performance. If a failing grade is assigned, the student’s Masters program will be terminated.

9. **Prior to graduation and after successfully completing** COMP-6999 (Master’s Project), **candidates are required to present a seminar on their projects.**

25.10.3 Other Regulations

1. Students from either Option 1 - Thesis Route or Option 2 - Course/Project Route with Work Term may request to transfer between both options once during their studies, **after at least two semesters in the program.** The transfer requires an approval from the Head of Department.

2. All candidates are expected to take an active part in seminars and other aspects of the academic life of the Department of Computer Science.
3. The Department of Computer Science Graduate Student Research Forum takes place in the Winter semester of the academic year. All M.Sc. students must present at the Research Forum at least once during their program.

4.3. Full-time students are expected to complete all program requirements in two years. Part-time students are expected to complete all program requirements in four years.