



**Faculty of Science**

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

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

A regular meeting of the Faculty Council of the Faculty of Science will be held on Wednesday, May 18, 2022, at 1:00 p.m. by Webex.

**AGENDA**

- 1. Regrets**
- 2. Adoption of the Minutes of April 20, 2022**
- 3. Business Arising from the Minutes**
- 4. Correspondence: None**
- 5. Faculty of Science Strategic Plan**
- 6. Reports of Standing Committees:**
  - A. Undergraduate Studies Committee:** No business.
  - B. Graduate Studies Committee:**  
Presented by Graham Layne, Chair, Graduate Studies Committee:
    - a. Department of Computer Science, Request for Approval of a Graduate Course, COMP 6980, Algorithmic Techniques for Artificial Intelligence, Paper 6.B.a. (pages 5 to 9)
    - b. Department of Computer Science, proposed calendar changes, Paper 6.B.b. (pages 10 to 14)
  - C. Library Committee:** No business
- 7. Reports of Delegates from Other Councils**
- 8. Report of the Dean**
- 9. Question Period**
- 10. Adjournment**

A handwritten signature in black ink, appearing to read "Travis Fridgen".

Travis Fridgen, Ph.D.  
Acting Dean of Science



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**FACULTY OF SCIENCE  
FACULTY COUNCIL OF SCIENCE  
Minutes of Meeting of April 20, 2022**

A meeting of the Faculty Council of the Faculty of Science was held on Wednesday, April 20, 2022, at 1:00 p.m. using Webex.

**FSC 2937**

**Present**

**Biochemistry**

M. Berry, R. Bertolo, V. Booth, S. Christian, D. Hunt, M. Longjohn, M. Mulligan

**Biology**

A Chaulk, E. Edinger, S. Leroux, P. Marino, Y. Wiersma

**Chemistry**

C. Bottaro, L. Cahill, H. Grover, M. Katz, F. Kerton, C. Kozak, E. Merschrod, S. Pansare, D. Stirling, J. Stockmann

**Computer Science**

S. Bungay, M. Emshey, M. Hamilton, A. Soares, T. Tricco

**Earth Sciences**

D. Guzzwell, G. Layne, A. Malcolm, M. Miskell, P. Morrill

**Economics**

K. Chu

**Mathematics & Statistics**

C. Cigsar, D. Dyer, C. Evans, D. Harvey, J.C. Loredó-Osti, S. MacLachlan, S. Mantyka, T. Sheel, T. Stuckless, S. Sullivan, Y. Yilmaz-Cigsar

**Ocean Sciences**

I. Fleming, P. Gagnon, E. Ignatz, D. Nichols

**Physics & Physical Oceanography**

D. Coombs, M. Evstigneev, E. Hayden, L. Zedel

**Psychology**

A. Anand, C. Quinn-Nilas, A. Swift-Gallant, C. Thorpe, C. Walsh

**Dean of Science Office**

M. Fitzpatrick, K. Foss, T. Fridgen, L. Frizzell, G. Jackson, J. Kavanagh, G. Kenny, P. MacCallum, V. MacNab, R. Newhook, R. Temple, J. Whelan

**Student Representatives:**

T. Durgut. A. Meyer

**FSC 2938 Regrets:**

D. Boyce, S. Dufour, X. Jiang, G. Miminis, K. Poduska, H. Reader, N. Ryan

**FSC 2939 Adoption of Minutes**

**Moved:** Minutes of the meeting of March 16, 2022, be adopted. (Sheel/Loredo-Osti)  
**Carried.**

**FSC 2940 Business Arising:** None

**FSC 2941 Correspondence:** None

**FSC 2942 Presentation by Dr. Alison Malcolm, Co-chair of the EDI Committee, Department of Earth Sciences:**

Drs. Alison Malcolm and Kim Welford co-chair the Department of Earth Science's Equity, Diversity and Inclusion Committee. Dr. Malcolm presented on the work done by this committee and their findings regarding EDI work. The committee was formed in September 2021 and has been active throughout the academic year. The committee members completed a program called Unlearning Racism in Geoscience (URGE), and they found this really insightful and recommended it for those doing EDI work. Dr. Malcolm's presentation will be forwarded to all faculty and staff in the Faculty of Science after this meeting.

**FSC 2943 Introduction of the Faculty of Science Strategic Plan**

The Strategic Plan for the Faculty of Science was introduced and a few questions addressed. Prior to the Faculty Council meeting in May, members of the Faculty of Science are asked to review the most recent iteration of the plan and submit more questions/concerns/edits. There will be a motion at the May Faculty Council to adopt the finalised version of the strategic plan.

**FSC 2944 Reports of Standing Committees:**

- A. Undergraduate Studies Committee:** No business.
- B. Graduate Studies Committee:** No business.
- C. Library Committee:** No business.

**FSC 2945 Reports of Delegates from Other Councils:** None

**FSC 2946****Report of the Dean:**

Presented by Dr. Travis Fridgen, Acting Dean.

**1. SEA Conference**

Two weekends ago the faculty of science hosted the first annual Scientific Endeavours in Academia conference. By all accounts it was a phenomenal success. It has been a long time since we have had the opportunity to stand in the same room, face-to-face with faculty, staff, and student colleagues and discuss science. For me, it was especially rewarding talking to all the undergraduate and graduate poster presenters in the poster sessions. A very big thanks and congratulations to Dr. Jacqueline Blundell, Interim Associate Dean of Science, for her work from the idea stage through to the conclusion of a very rewarding experience for everyone. Dr. Blundell led a fantastic team of organizers. Thank you to Rebecca Bennett (grad student), Melanie Fitzpatrick, Kelly Foss, Dr. Lynn Frizzell, Nikita Harvey (undergrad), Gail Kenny, Dr. Jenn Major, Phillip McCallum, Robin Temple, and Jessica Whalen. Thanks also to the more than 40 student volunteers; all the volunteer judges; the student, postdoctoral, and faculty presenters; our first ever plenary speaker, the Chief Medical Officer of Health, Dr. Janice Fitzgerald; and everyone who attended.

**2. Collective Bargaining**

The University and MUNFA negotiating teams have met now for about 10 full days of bargaining since we exchanged proposals on January 27<sup>th</sup>. I think we have made some excellent progress. Successful conclusions to language surrounding promotion and tenure, indigenization, as well as equity, diversity, inclusion, and anti-racism stick out as key achievements, and I really think these are examples where both sides of the table have worked together and made excellent contributions. There are two more full-day meetings planned in May before a likely break until the Fall. I haven't seen anything that will stand in the way of concluding successful negotiations in the Fall.

**FSC 2947****Question Period**

There will be an opportunity to discuss the strategic plan at the Faculty Council meeting in May. Prior to that meeting, any comments, suggestions, or recommendations can be sent to the Acting Dean for consideration.

The Acting Dean will consider the suggestion to set up an online space where there can be an exchange of ideas around the strategic plan.

**FSC 2948****Adjournment**

The meeting adjourned at 2:00 p.m.



# Request for Approval of a Graduate Course

School of Graduate Studies

Adobe Reader, minimum version 8, is required to complete this form. Download the latest version: <http://get.adobe.com/reader>. (1) Save the form by clicking on the diskette icon on the upper left side of the screen; (2) Ensure that you are saving the file in PDF format; (3) Specify where you would like to save the file, e.g. Desktop; (4) 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](mailto:sgs@mun.ca)

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

Course No.: COMP 6980

Course Title: Algorithmic Techniques for Artificial Intelligence

I. To be completed for all requests:

A. Course Type:  Lecture course  Lecture course with laboratory  
 Laboratory course  Undergraduate course<sup>1</sup>  
 Directed readings  Other (please specify)

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

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

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

E. Credit hours for this course: 3

F. Course description (reading list required):

This course covers algorithmic techniques and data structures used in modern problem-solving environments. Each topic will have a related assignment where the learned techniques are applied to simple video games. Additional details attached as appendix at end.

G. Method of evaluation:	Percentage	
	Written	Oral
Class tests	10	
Assignments	50	
Other (specify): Project	20	
Final examination:	20	

Total 100

<sup>1</sup> 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**

**David Churchill**

Course instructor

**March 24, 2022**

Date

*Dr. Oscar Meruvia-Pastor*

Approval of the head of the academic unit

**26Apr2022**

Date

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

\_\_\_\_\_  
Secretary, Faculty/School/Council

\_\_\_\_\_  
Date

**MEMORIAL UNIVERSITY OF NEWFOUNDLAND**  
**Department of Computer Science**

**Computer Science 6980**  
**Algorithmic Techniques for Artificial Intelligence**

Instructor:	David Churchill	Phone:	864-6140
Office:	ER-6030	Email:	dchurchill@mun.ca
Office Hours:	TBA	Website:	www.cs.mun.ca/~dchurchill/

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**Course Website:** <https://www.cs.mun.ca/~dchurchill/courses/3200>  
(most course activity will take place on D2L)

**Course Objectives:**

This course is an introduction to Artificial Intelligence (AI), covering algorithmic techniques and data structures used in modern problem-solving environments. Each topic will have a related assignment where the learned techniques are applied to simple games.

**Course Outline:**

- Introduction to Artificial Intelligence
  - What is AI? What can Modern AI do?
  - Games as a Testing Environment for AI
  - Agents, Environments, and Problems
- Search Algorithms
  - Exhaustive Search (BFS / DFS)
  - Heuristic Functions / Incorporating Knowledge
  - Heuristic Search (Best-First Search / A\*)
  - Introduction to Game Theory / Nash Equilibrium
  - Adversarial Search (Minimax / Alpha-Beta)
  - Data Structures / Optimizations for Search
- Genetic Algorithms (GA)
  - Introduction to Evolutionary Algorithms
  - GA Representations: (Genotype, Phenotype)
  - GA Implementation: Mutation, Crossover, Selection, Reproduction
- Reinforcement Learning (RL)
  - Introduction to RL: Agent, Environment, Actions, Policies, Rewards
  - Bandit Problems (Exploration vs. Exploitation)
  - Markov Decision Processes
  - Generalized Policy Iteration
  - Monte-Carlo Methods
  - Temporal Difference Learning (SARSA / Q-Learning)
- Neural Networks (NN)
  - Artificial Neurons / NN Structure / Training
  - Brief Introduction to Deep Learning

**Textbook:** Artificial Intelligence: A Modern Approach (Optional)  
Russel & Norvig

Reinforcement Learning: An Introduction (Free Online)  
Sutton & Barto  
<http://incompleteideas.net/book/the-book.html>

**Format:** 2 lectures per week on Tuesday / Thursday (80 minutes each)

### Evaluation:

The evaluation structure of the course is as follows:

• Assignments		50% (≤ 2 Per Group)
○ Intro to JS + BFS/ DFS	(Programming)	
○ A* Search Pathfinding	(Programming)	
○ Minimax + Alpha-Beta	(Programming)	
○ Genetic Algorithm	(Programming)	
○ Reinforcement Learning	(Programming)	
• Midterm Exam	(Written)	10% (Solo)
• Final Exam	(Written)	20% (Solo)
• Final Project	(Programming)	20% (Solo)

**Note:** Due the group work nature of this course, to effectively show that you have individually learned the material, you must pass the final exam to pass the course. If your grade on the final exam is less than 50%, then your overall course grade will be equal to the mark that you received on the final exam. If your final exam grade is greater than or equal to 50%, your course grade is determined by the scheme above.

### Memorial University Policies:

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

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



**Differences from COMP 3200 (undergrad):**

This course will be taught along with the undergraduate course COMP 3200, and therefore will cover many of the same topics as that course. In order to differentiate it from COMP 3200, there will be several differences which assign extra reading / work to graduate students, in order to further their learning beyond that of the undergraduate course.

- Graduate students will be assigned extra reading for advanced topics
- This course will have a project requirement, unlike 3200
- This course will have a more difficult final exam from 3200
- Assignments will have bonus material for graduate students

24Mar2022

Proposal for calendar changes related to COMP 6980 – Algorithmic Techniques for Artificial Intelligence.

### Summary:

- 1) Regularizing COMP 6980 from Special Topics course to a Regular Offering
- 2) Adding COMP6980 to the list of courses that satisfy the algorithms requirement for the Work term route

## Details:

- 1) Regularizing COMP 6980 from Special Topics course to a Regular Offering:

## Rationale

Comp6980 was introduced in 2020 as a Special Topics course and has been offered 2 times. It is the intention of Dr. Churchill and the Department to offer this course regularly, as it is part of the core courses required in the new Master of Artificial Intelligence, it is in high demand, and it is necessary to support the second calendar change proposed below.

## Proposed Calendar change

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

### 28.10.4 Courses

A selection of the following graduate courses will be offered to meet the requirements of students, as far as the resources of the Department will allow. Normally, students will be expected to complete their course work during the fall and winter semesters. Courses might not be offered in the spring semester.

- 601W Work Term
- 6758-6769 Special Topics in Computer Applications
- 6770-6790 Special Topics in Computer Science
- 690A/B 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 Data Mining Techniques and Methodologies (*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 (*credit may be obtained for only one of 6726 and 6926*)
- 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 be obtained for only one of 6931, 6732, and CMSC 6910*) (*cross-listed with CMSC 6910*)
- 6932 Matrix Computations in Control (*credit may be obtained for only one of 6932 or 6738*)
- 6933 Nonlinear and Linear Optimization (*cross-listed with Mathematics 6202*)
- 6934 Introduction to Data Visualization (*credit may be obtained for only one of 6934 or 6774*)
- **6980 Algorithmic Techniques for Artificial Intelligence.**
- ~~6980-6998 Special Topics in Computer Science~~
- **6981-6998 Special Topics in Computer Science**
- 6999 Master's Project

Final Calendar version:

#### 28.10.4 Courses

A selection of the following graduate courses will be offered to meet the requirements of students, as far as the resources of the Department will allow. Normally, students will be expected to complete their course work during the fall and winter semesters. Courses might not be offered in the spring semester.

- 601W Work Term
- 6758-6769 Special Topics in Computer Applications
- 6770-6790 Special Topics in Computer Science
- 690A/B 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 Data Mining Techniques and Methodologies (*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 (*credit may be obtained for only one of 6726 and 6926*)
- 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 be obtained for only one of 6931, 6732, and CMSC 6910*) (*cross-listed with CMSC 6910*)
- 6932 Matrix Computations in Control (*credit may be obtained for only one of 6932 or 6738*)
- 6933 Nonlinear and Linear Optimization (*cross-listed with Mathematics 6202*)
- 6934 Introduction to Data Visualization (*credit may be obtained for only one of 6934 or 6774*)
- 6980 Algorithmic Techniques for Artificial Intelligence.
- 6981-6998 Special Topics in Computer Science
- 6999 Master's Project

- 2) Adding COMP6980 to the list of courses that satisfy the algorithms requirement for the Workterm route:

### Rationale

Currently, there are two courses that can be used to satisfy the algorithms requirement in the workterm route: Comp 6901 – Applied Algorithms and Comp 6902 – Computational Complexity. For the Department, it makes sense for the course to be included in this list, as it is in fact an algorithms course, as the name suggests.

### Proposed Calendar change

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

#### 28.10.2.2 Option 2 - Work Term Route

1. Students are required to complete a minimum of 24 credit hours in graduate program courses, of which at least 18 credit hours must be in Computer Science, whereas the remaining 6 should be related to computer science, and included in the list of elective courses maintained by the Graduate Studies Committee, or previously approved by the Graduate Studies Committee, or its Chair.
2. Within this credit requirement, a student must take the following courses:
  - o COMP 6999 (Master's Project)
  - o One course in Software Engineering (COMP 6905)
  - o One course in Algorithms (~~COMP 6901 or COMP 6902~~) (COMP 6901, COMP 6902, or COMP 6980)
  - o

Final Calendar version:

#### 28.10.2.2 Option 2 - Work Term Route

1. Students are required to complete a minimum of 24 credit hours in graduate program courses, of which at least 18 credit hours must be in Computer Science, whereas the remaining 6 should be related to computer science, and included in the list of elective courses maintained by the Graduate Studies Committee, or previously approved by the Graduate Studies Committee, or its Chair.
2. Within this credit requirement, a student must take the following courses:
  - o COMP 6999 (Master's Project)
  - o One course in Software Engineering (COMP 6905)
  - o One course in Algorithms (COMP 6901, COMP 6902, or COMP 6980)