SFU GRADUATE AND POSTDOCTORAL STUDIES

MEMORANDUM

ATTENTION	Senate	**DATE**	May 21, 2020
FROM	Jeff Derksen, Chair of Senate Graduate Studies Committee (SGSC)		
RE:	New Course Proposals		

For information:

Acting under delegated authority at its meeting of May 12, 2020, SGSC approved the following new courses, effective **Spring 2021:**

Faculty of Applied Science

School of Computing Science

1) New course: CMPT 724 Affective Computing
2) New course: CMPT 728 Deep Learning

Faculty of Environment

School of Environmental Science

3) New course: EVSC 695 Special Topics in Environmental Science

Senators wishing to consult a more detailed report of curriculum revisions may do so on the Senate Docushare repository at https://docushare.sfu.ca/dsweb/View/Collection-12682

MEMORANDUM

Attention	Dr. Jeff Derksen	Date March 27, 2020
	Dean, Graduate Studies	
From	Dr. Parvaneh Saeedi	psaeedi@sfu.ca
	Faculty of Applied Science, Graduate Studies Committee	

Re: FAS-CMPT's new course ~~and course change~~ – CMPT 724, CMPT 728, ~~CMPT 825~~

FAS School of Computing Science is currently offering many highly specialized but low-enrollment specialized topics (ST) graduate courses and relatively much fewer foundational core CMPT graduate courses. Our graduate students are thus having difficulty choosing relevant courses, especially given increased demands from our growing graduate population, including our Professionals Masters (Prof MSc) programs.

We propose to create new 700-level courses that cover foundational, core graduate-level computing science topics, which are appealing to our broad graduate student population (Theses and Prof MSc), and even to some senior undergraduates (e.g. Accelerated Masters). We foresee this will strengthen our graduate program, provide better support for our growing Prof MSc specializations, and increase enrollment in graduate classes.

Therefore, Faculty of Applied Sciences has approved the following and would request for the calendar update effective Spring 2021.

New course proposals:
1. CMPT 724– Affective Computing
2. CMPT 728 – Deep Learning

~~Change of course number:~~
1. ~~CMPT 825 – Natural Language Processing~~

Please let me know if there are any questions or concern.

Regards,
Parvaneh Saeedi

SpMEMO

BURNABY
9971 Applied Sciences
Building
8888 University Drive
Burnaby BC V5A 1S6
Canada

SURREY
250-13450 102 Avenue
Surrey, BC V3T 0A3
Canada

Tel: 778-782-4277
Fax: 778-782-3045
Web: www.cs.sfu.ca

ATTENTION	Parvaneh Saeedi, Associate Director
FROM	Ghassan Hamarneh, Graduate Director
RE	New 700 Level Course Proposals Effective Spring 2021
DATE	Mar 3, 2020

COURSE PROPOSALS – effective Spring 2021

Our School of Computing Science is currently offering many highly-specialized, low-enrollment specialized topics (ST) graduate courses and relatively much fewer foundational core CMPT graduate courses. Our graduate students are thus having difficulty choosing relevant courses, especially given increased demands from our growing graduate population, including our Professionals Masters (Prof MSc) programs. We propose to create new 700-level courses that cover foundational, core graduate-level computing science topics, which are appealing to our broad graduate student population (Theses and Prof MSc), and even to some senior undergraduates (e.g. Accelerated Masters). We foresee this will strengthen our graduate program, provide better support for our growing Prof MSc specializations, and increase enrollment in graduate classes.

The following have been approved by CMPT GPC and school director.
New course proposals:
CMPT 724– Affective Computing
CMPT 728 – Deep Learning
~~Change of course number:~~
~~CMPT 825 – Natural Language Processing~~

If you have any questions, please let me know.

Ghassan Hamarneh
Graduate Chair, School of Computing Science

New Graduate Course Proposal

Course Subject (eg. PSYC) CMPT	Number (eg. 810) 724	Units (eg. 4) 3

Course title (max. 100 characters)

Affective Computing

Short title (for enrollment/transcript - max. 30 characters) Affective Computing

Course description for SFU Calendar (course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description)

> Affective Computing is the study of emotions and their impact in building interactive, intelligent machines and interfaces. Students will learn theories and models of affect (moods, feelings and emotions), as well as computational social signal processing methods to generate socially intelligent behaviour for robots and agents that interact with humans.

Rationale for introduction of this course

Affective Computing is offered at other universities at the undergraduate and graduate level. There is currently no such course at SFU.

Term of initial offering (eg. Fall 2019) Spring 2021	Course delivery (eg. 3 hrs/week for 13 weeks) 3 hrs/week for 13 weeks
Frequency of offerings/year 1/year	Estimated enrollment per offering 50

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)
None

Prerequisite and/or Corequisite

Criminal record check required? ☐ Yes — if yes is selected, add this as prerequisite   Additional course fees? ☐ Yes ☑ No

Campus where course will be taught ☑ Burnaby ☐ Surrey ☐ Vancouver ☐ Great Northern Way ☐ Off campus

Course Components * ☑ Lecture ☐ Seminar ☐ Lab ☐ Independent ☐ Capstone ☐ _____

Grading Basis ☑ Letter grades   ☐ Satisfactory/ Unsatisfactory   ☐ In Progress / Complete

Repeat for credit? ☐ Yes ☑ No	Total repeats allowed? 0_____	Repeat within a term? ☐ Yes ☑ No
Required course? ☐ Yes ☑ No	Final exam required? ☑ Yes ☐ No	Capstone course? ☐ Yes ☑ No

Combined with a undergrad course? ☐ Yes ☑ No   If yes, identify which undergraduate course and the additional course requirements for graduate students:

* See important definitions on the curriculum website.

▰▶ RESOURCES

If additional resources are required to offer this course, provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course
Angelica Lim, Fred Popowich

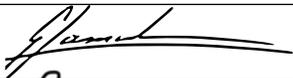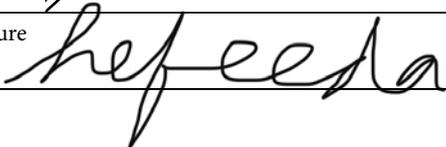| Additional faculty members, space, and/or specialized equipment required in order to offer this course |
|---|
| |

▰▶ CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
CMPT	Ghassan Hamarneh	hamarneh@sfu.ca

▰▶ ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee **Ghassan Hamarneh**	Signature	Date **2019-Jun-05**
Department Chair Mohamed Hefeeda	Signature	Date June 5, 2019

▰▶ FACULTY APPROVAL

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content

Overlap check done? ☑ YES

This approval indicates that all the necessary course content and overlap concerns have been resolved. The Faculty/Academic Unit commits to providing the necessary resources.

Faculty Graduate Studies Committee Parvaneh Saeedi	Signature	Date March 27, 2020
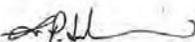
A library review will be conducted. If additional funds are necessary, DGS will contact the academic unit prior to SGSC.

▰▶ SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee Jeff Derksen	Signature	Date May 21, 2020

AFFECTIVE COMPUTING - CMPT 724

CALENDAR DESCRIPTION
Affective Computing is the study of emotions and their impact in building interactive, intelligent machines and interfaces. Students will learn theories and models of affect (moods, feelings and emotions), as well as computational social signal processing methods to recognize and generate socially intelligent behaviours, for robots and agents that interact with humans.

COURSE DETAILS
Emotions play a central role in our daily lives as humans. The field of affective computing studies how emotions can have a major impact in the construction of interactive, intelligent agents and interfaces. This course will cover topics in affective computing as follows. First, theories and models of emotion (including core affect, mood, feelings) from psychological, neuroscientific and computational perspectives will be reviewed. Secondly, we will study techniques for automatic perception of human internal state, including using machine learning to understand sentiment using modalities such as gaze, posture, speech, text, movement and music. Thirdly, synthesis and expression of emotion and empathy in virtual agents, robots, chatbots and synthetic characters will be explored. Finally, we will delve into the implementation of emotion theories, including how to use the above techniques to make more believable, effective, enjoyable, and useful intelligent interactive systems.

Topics may include:
- Psychological theories of emotion
- Neuroscientific perspectives of emotion
- Physiology of emotion
- Computational models of affect
- Robots / agents that "have" emotion
- Multimodal affect recognition
- Expression of emotion by robots / agents / synthetic characters
- Social signal processing
- Speech/sound processing and synthesis
- Visual processing of human behaviour
- Affect detection in text
- Affect elicitation and user studies
- Machine empathy
- Ethical implications of affective computing
- Applications in socially interactive systems

GRADING:
The course grade will be based on assignments (20%), a project (30%), and a final exam (50%).

RECOMMENDED READING:
- Picard, R. W. Affective Computing. MIT Press, 2000. ISBN: 9780262661157.
- Calvo, R. A., S. K. D'Mello, J. Gratch, et al. The Oxford Handbook of Affective Computing. Oxford University Press, 2014. ISBN: 9780199942237.

New Graduate Course Proposal

Course Subject (eg. PSYC) CMPT	Number (eg. 810) 728	Units (eg. 4) 3

Course title (max. 100 characters)

Deep Learning

Short title (for enrollment/transcript - max. 30 characters) Deep Learning

Course description for SFU Calendar (course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description)

Machine learning has become the main framework for building programs that perform intelligent tasks. In fields such as computer vision and natural language processing, many recent successes have been achieved using neural nets with several layers, so-called deep neural nets. Students will look at deep neural nets, techniques for training them from data, and significant applications. They will be presented with network architectures such as convolutional neural nets, autoencoders, recurrent neural nets, long-short term memory networks, and generative adversarial networks. Advanced training techniques to be described include dropout, batch normalization, and adaptive step size selection.

Rationale for introduction of this course

There is great demand for grad courses on machine learning, driven by the many fields (visual computing, NLP, biology, etc) that apply ML and the Data Science Master's program. Deep learning is arguably the most successful general machine learning framework for many applications.

Term of initial offering (eg. Fall 2019) Spring 2021	Course delivery (eg. 3 hrs/week for 13 weeks) 3 hrs/week for 13 weeks
Frequency of offerings/year 1/year	Estimated enrollment per offering 80

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)

Prerequisite and/or Corequisite

Criminal record check required? ☐ Yes   if yes is selected, add this as prerequisite   Additional course fees? ☐ Yes ☑ No

Campus where course will be taught ☑ Burnaby   ☐ Surrey   ☐ Vancouver   ☐ Great Northern Way   ☐ Off campus

Course Components *   ☑ Lecture   ☐ Seminar   ☐ Lab   ☐ Independent   ☐ Capstone   ☐ _____

Grading Basis   ☑ Letter grades   ☐ Satisfactory/ Unsatisfactory   ☐ In Progress / Complete

Repeat for credit? ☐ Yes ☑ No	Total repeats allowed? 0_____	Repeat within a term? ☐ Yes ☑ No
Required course? ☐ Yes ☑ No	Final exam required? ☑ Yes ☐ No	Capstone course? ☐ Yes ☑ No

Combined with a undergrad course? ☐ Yes ☑ No   If yes, identify which undergraduate course and the additional course requirements for graduate students:

* See important definitions on the curriculum website.

If additional resources are required to offer this course, provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course
Maxwell Libbrecht, Oliver Schulte, Greg Mori, Anoop Sarkar

Additional faculty members, space, and/or specialized equipment required in order to offer this course

▶ CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
CMPT	Oliver Schulte	oschulte@sfu.ca

▶ ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Ghassan Hamarneh		2019-Apr-18
Department Chair	Signature	Date
Mohamed Hefeeda		18 April 2019

▶ FACULTY APPROVAL

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content

Overlap check done?   [X] YES

This approval indicates that all the necessary course content and overlap concerns have been resolved. The Faculty/Academic Unit commits to providing the necessary resources.

Faculty Graduate Studies Committee	Signature	Date
Parvaneh Saeedi		April 15, 2020

A library review will be conducted. If additional funds are necessary, DGS will contact the academic unit prior to SGSC.

▶ SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee	Signature	Date
Jeff Derksen		May 21, 2020

ADMINISTRATIVE SECTION (for DGS office only)
Library Check: _____
Course Attribute: _____   If different from regular units:
Course Attribute Value: _____   Academic Progress Units: _____
Instruction Mode: _____   Financial Aid Progress Units: _____
Attendance Type: _____

COURSE OUTLINE

COURSE NAME

Deep Learning
CMPT 728

DESCRIPTION

Machine learning has become the main framework for building programs that perform intelligent tasks. In fields such as computer vision and natural language processing, many recent successes have been achieved using neural nets with several layers, known as deep neural nets. Students will look at deep neural nets, techniques for training them from data, and significant applications. The course assumes a background in general machine learning, and will be difficult for students without sufficient preparation.

TOPICS

- Training feedforward neural nets (backpropagation)
- Advanced training topics, including: dropout, batch normalizations, step size adapation, hyperparameter selection
- Common architectures and their applications: convolutional neural networks, recurrent neural networks, autoencoders
- Embeddings (skip-gram models, graph neural networks)
- Generative models: generative adversarial models, variational auto-encoders
- Comparison of neural networks with other machine learning approaches (linear classifiers, kernel methods)
- Adversarial attacks against neural networks
- Interpreting neural networks
- Optional topics if time permits (such as deep reinforcement learning, attention models,)

GRADING

        Grading will be based on written assignments (3-5), a midterm and a final. The main component of the assignments will be applying neural networks to datasets. Grading breakdown:

* Assignments 50%
* Midterm Exam 20%
* Final Exam 30%

MATERIAL

Textbook: Introduction to Deep Learning, by Eugene Charniak.
Lectures Notes from Instructor, Supplementary on-line material

Reference: Deep Learning, by Goodfellow, Bengio, and Courville. Available on-line at
http://www.deeplearningbook.org

SFU

DONGYA YANG, PH.D., ASSOCIATE DEAN, RESEARCH AND GRADUATE STUDIES
FACULTY OF ENVIRONMENT

TASC 2 Building, Room 8905	TEL 778.782.9606	donyang@sfu.ca
8888 University Drive, Burnaby,		www.fenv.sfu.ca
BC Canada V5A 1S6		

MEMO

To:	Dr. Jeff Derksen, Dean of Graduate Studies / Chair of SGSC
From:	Dr. Dongya Yang, Associate Dean / Chair, Faculty of Environment Graduate Studies Committee
Subject:	New Course: EVSC 695 (ST)
Date:	April 14, 2020
CC:	Dr. Jeremy Venditti, Director of the School of Environmental Science

The Faculty of Environment Graduate Studies Committee has approved the request from the School of Environmental Science (EVSC) to create a new course for Spring 2021:

1) *EVSC 695: Special Topics in Environmental Science*

The school is currently running SFU-BCIT joint MSc in Ecological Restoration (MER). The proposed new courses will make more electives available for MER students.

Please include this item on the agenda for the next SGSC meeting.

The filled form and the original memo from EVSC are attached. Should you have any questions please feel free to contact me.

Sincerely,

Dongya Yang, Ph.D.
Associate Dean, Research and Graduate Studies
Professor of Bioarchaeology

SCHOOL OF ENVIRONMENTAL SCIENCE

TASC2 8900		TEL 778.782.8797	
8888 University Drive, Burnaby, BC		FAX 778.782.8788	www.sfu.ca/EVSC
Canada V5A 1S6			

MEMORANDUM

ATTENTION	Dongya Yang, Associate Dean, Faculty of Environment	**DATE**	March 23, 2020
FROM	Jeremy Venditti, Director, School of Environmental Science	**PAGES**	2
RE:	Creation of EVSC 695		

Dear Dongya,

The School of Environmental Science would like to request a new course be created for Spring 2021:

> 1) *EVSC 695: Special Topics in Environmental Science*

EVSC 695: Special Topics in Environmental Science

Rationale for the course: This special topics course is intended for faculty in the School of Environmental Science to teach graduate level courses for students in the Faculties of Environment and Science.

Course title (long and short): Special Topics in Environmental Science
Proposed course subject and number: EVSC 695
Units: 4

Short course description (less than 50 words): A course offered within the field of Environment Science to provide students with understanding, perspective and experience in emerging and important areas of Environmental Science.

Prerequisite: Permission from the instructor.
Grading basis: Letter grades
Final exam: Dependent on topic
Proposed term of initial offering: Spring 2021

The manner in which the course relates to the departmental curriculum: Currently the School of Environmental Science does not have a graduate program, yet we have faculty members interesting in offering graduate courses to the university community. The School of Environmental Science currently administers the Masters of Ecological Restoration (MER) Program. MER students are required to take elective courses at SFU, but there are few available to them. Topics that may covered include numerical modelling, quantitative environmental data analysis, or graduate-level versions of upper division undergraduate courses.

These courses would be taught by School of Environmental Science faculty and may be of interest research-based graduate students interested in a topic, but wanting graduate level credit. The School has begun discussions about interdisciplinary graduate programming, including a professional and research-based streams, in the area of integrated water science, and this Special Topics course will provide us with the ability to test offer courses that may become part of the programming.

The probable audience (level, number of registrants, fields of study, etc.): <10 graduate students in the Faculty of Environment and perhaps a few from the Faculty of Science.

Regards,

Dr. Jeremy G. Venditti

Director and Professor	Professor
School of Environmental Science	Department of Geography
Simon Fraser University	Simon Fraser University
Burnaby BC, Canada	Burnaby BC, Canada
Email: EVSC_ Director@sfu.ca	Email: jeremy_venditti@sfu.ca
www.sfu.ca/evsc.html	www.sfu.ca/~jvenditt/

New Graduate Course Proposal

Course Subject (eg. PSYC) **EVSC**	Number (eg. 810) **695**	Units (eg. 4) **4**

Course title (max. 100 characters)

Special Topics in Environmental Science

Short title (for enrollment/transcript - max. 30 characters) Special Topics in Environ. Sci

Course description for SFU Calendar (course descriptions should be brief and should never begin with phrases such as "This course will..." or "The purpose of this course is..." If the grading basis is satisfactory/unsatisfactory include this in the description)

A specific topic within the field of Environment not examined in depth in regular courses. Students will learn emerging and important areas of the environment.

Rationale for introduction of this course

See Attached

Term of initial offering (eg. Fall 2019) **Spring 2021**	Course delivery (eg. 3 hrs/week for 13 weeks) **4 hrs contact for 13 weeks**
Frequency of offerings/year **1/year**	Estimated enrollment per offering **10**

Equivalent courses (courses that replicates the content of this course to such an extent that students should not receive credit for both courses)

Prerequisite and/or Corequisite

Criminal record check required? ☐ Yes   if yes is selected, add this as prerequisite   Additional course fees? ☐ Yes ☑ No

Campus where course will be taught ☑ Burnaby   ☐ Surrey   ☐ Vancouver   ☐ Great Northern Way   ☐ Off campus

Course Components * ☑ Lecture   ☐ Seminar   ☐ Lab   ☐ Independent   ☐ Capstone   ☐ _____

Grading Basis   ☑ Letter grades   ☐ Satisfactory/ Unsatisfactory   ☐ In Progress / Complete

Repeat for credit? ☑ Yes ☐ No	Total repeats allowed? _1_____	Repeat within a term? ☐ Yes ☑ No
Required course? ☐ Yes ☑ No	Final exam required? ☐ Yes ☑ No	Capstone course? ☐ Yes ☑ No

Combined with a undergrad course? ☐ Yes ☑ No   If yes, identify which undergraduate course and the additional course requirements for graduate students:

* See important definitions on the curriculum website.

RESOURCES

If additional resources are required to offer this course, provide information on the source(s) of those additional resources.

Faculty member(s) who will normally teach this course
depending on topic

Additional faculty members, space, and/or specialized equipment required in order to offer this course

CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
Environmental Science	Jeremy Venditti	evsc_director@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair Jeremy Venditti	Signature Jeremy Venditti	Date April 30 2020

Digitally signed by Jeremy Venditti
DN: cn=Jeremy Venditti, o=Simon Fraser University, ou=Geography, email=jeremy_venditti@sfu.ca, c=CA
Date: 2020.04.30 17:16:21 -07'00'

FACULTY APPROVAL

The course form and outline must be sent by FGSC to the chairs of each FGSC (fgsc-list@sfu.ca) to check for an overlap in content

Overlap check done? ☐ YES   N/A

This approval indicates that all the necessary course content and overlap concerns have been resolved. The Faculty/Academic Unit commits to providing the necessary resources.

Faculty Graduate Studies Committee Dongya Yang	Signature	Date April 14, 2020
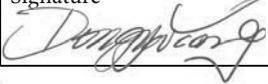
A library review will be conducted. If additional funds are necessary, DGS will contact the academic unit prior to SGSC.

SENATE GRADUATE STUDIES COMMITTEE APPROVAL

Senate Graduate Studies Committee Jeff Derksen	Signature	Date May 21, 2020

ADMINISTRATIVE SECTION (for DGS office only)
Library Check: _____
Course Attribute: _____
Course Attribute Value: _____
Instruction Mode: _____
Attendance Type: _____

If different from regular units:
Academic Progress Units: _____
Financial Aid Progress Units: _____

New Course Proposal

EVSC 695 Special Topics in Environmental Science

Rationale:

Currently the School of Environmental Science does not have a graduate program, yet we have faculty members interesting in offering graduate courses to the university community. The School of Environmental Science currently administers the Masters of Ecological Restoration (MER) Program. MER students are required to take elective courses at SFU, but there are few available to them. Topics that may covered include numerical modelling, quantitative environmental data analysis, or graduate-level versions of upper division undergraduate courses. These courses would be taught by School of Environmental Science faculty and may be of interest research-based graduate students interested in a topic, but wanting graduate level credit. The School has begun discussions about interdisciplinary graduate programming, including a professional and research-based streams, in the area of integrated water science, and this Special Topics course will provide us with the ability to test offer courses that may become part of the programming.