SFU GRADUATE AND POSTDOCTORAL STUDIES

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MEMORANDUM

ATTENTION Senate

DATE March 25, 2021

FROM Jeff Derksen,
Chair of Senate Graduate Studies Committee (SGSC)

RE: New Course Proposals

For information:
Acting under delegated authority at its meeting of March 2, 2021, SGSC approved the following new course, effective **Fall 2021:**

Faculty of Applied Sciences
School of Computing Science

1) New course: CMPT 750 Computer Architecture

Beedie School of Business

2) New Course: BUS 579 Professional Development
3) New Course: BUS 799 Special Topics

Faculty of Education

4) New Course: EDUC 888 MEd Comprehensive Examination

Faculty of Science
Department of Statistics and Actuarial Science

5) New Course: ACMA 830 Stochastic Processes for Insurance and Finance
6) New Course: ACMA 832 Actuarial Risk Management

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

OFFICE OF THE DEAN
Faculty of Applied Sciences
Simon Fraser University

MEMORANDUM

Attention Dr. Jeff Derksen
Dean, Graduate Studies

Date: Jan 29, 2021

From Dr. Parvaneh Saeedi, psaeedi@sfu.ca
Faculty of Applied Science, Graduate Studies Committee

Re: FAS-CMPT's new course proposal - CMPT 750

The faculty of Applied Sciences Graduate Studies Committee proposes a new graduate course: CMPT 750- Computer Architecture, effective Fall 2021.

This course will provide our graduate students with the much-needed background in the principles of computing systems' architecture. We have noticed that such material has been missing from our graduate program curriculum.

Regards,
Parvaneh Saeedi

SFU

COMPUTING SCIENCE

MEMO

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ATTENTION	**Parvaneh Saeedi, Associate Director**
FROM	Jiangchuan Liu, Graduate Program Director
RE	New Course Proposal – CMPT 750
DATE	January 29, 2021

NEW COURSE PROPOSAL - Effective Fall 2021

CMPT 750 – Computer Architecture

The School of Computing Science is proposing a new graduate course effective Fall 2021 – Computer Architecture. The GPC found that a course of this nature has been missing from our curriculum for a long time, and the new course would fill in much needed curriculum in the principles of the architecture of computing systems. Topics include: superscalar processor micro-architecture, speculative execution, cache and memory hierarchy, multiprocessors, cache coherence, memory consistency, implications of technology on architecture, parallel architectures (multi-threading, GPUs, vector processors).

If you have any questions, please let me know.

Jiangchuan Liu
Graduate Chair, School of Computing Science

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) CMPT	Number (eg. 810) 750	Units (eg. 4) 3

Course title (max. 100 characters)

Computer Architecture

Short title (for enrollment/transcript - max. 30 characters) **Computer Architecture**

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)

Principles of the architecture of computing systems. Topics include: superscalar processor micro-architecture, speculative execution, cache and memory hierarchy, multiprocessors, cache coherence, memory consistency, implications of technology on architecture, parallel architectures (multi-threading, GPUs, vector processors).

Rationale for introduction of this course

Students who are interested in computer systems need to learn the basic principles of computer architecture to enhance their understanding of how computer systems work. As the interface between hardware and software, computer architecture provides computer science students with knowledge of the processors and memory systems that their program runs on. This enables graduate students to better understand computer systems and how they are designed.

This course is taught in many CS, CSE and ECE departments across North America.

Term of initial offering (eg. Fall 2019) Fall 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 20

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

Students with credit for CMPT 450 may not take this course for further credit

Prerequisite and/or Corequisite Recommended: CMPT 295 or equivalent

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:

CMPT 450. Graduate students will need to do a more advanced project to satisfy this course's requirements.

* 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
Alaa Alameldeen, Arrvindh Shriraman
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	Jiangchuan Liu	jcliu@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee Jangchuan Liu	Signature	Date Jan 29, 2021
Department Chair Mohamed Hefeeda	Signature	Date 29 Jan 2021

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 Jan 29, 2021

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 March 25, 2021

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

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

Course Outline - CMPT 750 - Computer Architecture

Calendar Objective/Description

Principles of the architecture of computing systems. Topics include: superscalar processor micro-architecture, speculative execution, cache and memory hierarchy, multiprocessors, cache coherence, memory consistency, implications of technology on architecture, parallel architectures (multi-threading, GPUs, vector processors).

Instructor's Objectives

This course teaches the principles of the architecture of computing systems. Topics include: superscalar processor micro-architecture, speculative execution, cache and memory hierarchy, multiprocessors, cache coherence, memory consistency, implications of technology on architecture, parallel architectures (multi-threading, GPUs, vector processors).

Prerequisites

CMPT 295 (or equivalent) is strongly recommended.

Topics

- Basic Concepts of superscalar processor microarchitectures: structural/data/control dependences, register renaming, out-of-order issue/execution, branch prediction, precise interrupts, issue logic, memory ordering
- Cache hierarchy: memory-level parallelism, cache management (prefetching, replacement, insertion policies, dead block prediction)
- Multiprocessor basics: parallel programs, shared-memory and distributed memory multiprocessors, cache coherence protocols (snooping and directory protocols), memory consistency models
- Main memory architecture: DRAM basics, memory controllers
- Impact of technology on architecture: Memory and logic power, active and idle power.
- Multi-threading: Simultaneous multi-threading, speculative multi-threading, multi-core processors, runahead execution.
- Other architectures: Vector architectures, Single-Instruction Multiple-Data architectures, Dataflow architectures, Graphics Processing Units, Very-Large Instruction Word architectures

Grading

Exams 40% (one midterm and one final exam), Homework assignments 25%, Project 35% (tentative)

Required Books

- None. Course material will use original paper references.

Reference Books

- Computer Architecture: A Quantitative Approach, John Hennessy and David Patterson, Morgan Kaufmann, 2017, 9780128119051

SFU BEEDIE SCHOOL OF BUSINESS

Segal Graduate School | Office of the Associate Dean, 500 Granville Street, Vancouver, BC V6C 1W6 | TEL 778.782.9255, FAX 778.782.5122 | busadmin@sfu.ca

Memo to SGSC

To: **Senate Graduate Studies Committee**
From: **Andrew Gemino, Dean pro tem**
Re: **Calendar Changes**
Date: **January 4, 2021**

The following curriculum revisions have been approved by the Beedie School of Business ~~for the Graduate Diploma in Management (GDM) and the Master of Management (MiM) program~~ and are forwarded to the Senate Graduate Studies Committee for approval. This program should be effective for Fall 2021.

Please include them on the next SGSC agenda.

- ~~**Calendar Entry Change for Master in Management**~~
- ~~**Calendar Entry Change for Graduate Diploma in Management**~~
- **New Graduate Course Proposal: BUS 579**

Thank you for your attention herein. Should you have any questions or concerns, please do not hesitate to contact me.

Dr. Andrew Gemino
Professor, Management Information Systems
Dean pro tem, Beedie School of Business

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) BUS	Number (eg. 810) 579	Units (eg. 4) 0

Course title (max. 100 characters)
Professional Development

Short title (for enrollment/transcript - max. 30 characters) Professional Development

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)

Through experiential and applied learning opportunities, students will understand and experience the fundamental components of a job-search and career progression skills for securing employment and achieving career objectives. Co-curricular opportunities will compliment and build upon the learning experience, and contribute to overall development and personal branding.
Graded on a satisfactory/unsatisfactory basis

Rationale for introduction of this course

Provides opportunities for co-curricular experiences and career management services. The 0-unit course will be offered to students in BUS graduate programs and focus on personal and professional development.

Term of initial offering (eg. Fall 2019) Fall 2021	Course delivery (eg. 3 hrs/week for 13 weeks) 2 hrs/week for 13 weeks
Frequency of offerings/year 3/year	Estimated enrollment per offering 40

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? 3

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
No instructor required. Supported by Graduate Career Management Centre and Graduate Student Engagement Office.
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
Beedie School of Business	Casey Yorko	casey_yorko@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair	Signature	Date

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 (Not Required)

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
Andrew Gemino		November 9, 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		March 25, 2021

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

If different from regular units:
Academic Progress Units: 6
Financial Aid Progress Units: 6

SFU BEEDIE SCHOOL OF BUSINESS
SEGAL GRADUATE SCHOOL

BUS 579: Professional Development

Facilitators: Academic Director	Semester: Fall 2021, Spring 2022, Summer 2022
Phone: TBA	
Email: TBA	

Course Description

Through experiential and applied learning opportunities, students will understand and experience the fundamental components of a job-search and career progression skills for securing employment and achieving career objectives. Co-curricular opportunities will compliment and build upon the learning experience, and contribute to overall development and personal branding.

Objectives

To provide intentional, integrated, and ongoing skill-development opportunities to students in BUS graduate programs

Learning Objectives:

- Identify strengths, skills, and experiences that contribute to career success
- Participate in opportunities that compliment and build upon the learning experience
- Articulate strengths, skills, experiences, and value to an organization
- Understand that career development is process of learning, adjusting goals, building upon skills, and experiences

Course Expectations

This is a required course and full participation is expected. Evaluation in this course will be based on a combination of individual and group activities, including workshops, panel discussions, speaker events, tours, co-curricular opportunities, and one-on-one advising appointments.

Course Structure

This course will consist of a mixture of individual and group applied learning opportunities. Components will include:

1. Self-Exploration
2. Market Research
3. Career Goal
4. Skills Analysis
5. Personal Marketing (résumé, cover letter, LinkedIn, networking)

Book and Materials

All materials will be provided for each session.

Learning and Assessments

Assessment summary

This is a required course and full participation is expected. Evaluation in this course will be based on a combination of individual and group activities, including a reflective activity.

Reading and Course Schedule

Readings can be found on Canvas.

Academic Integrity

SFU's Academic Integrity web site http://www.sfu.ca/students/academicintegrity.html is filled with information on what is meant by academic dishonesty, where you can find resources to help with your studies and the consequences of cheating. Check out the site for more information and videos that help explain the issues in plain English.

Each student is responsible for his or her conduct as it affects the University community. Academic dishonesty, in whatever form, is ultimately destructive of the values of the University. Furthermore, it is unfair and discouraging to the majority of students who pursue their studies honestly. Scholarly integrity is required of all members of the University. http://www.sfu.ca/policies/gazette/student/s10-01.html

ACADEMIC INTEGRITY: YOUR WORK, YOUR SUCCESS

About the Course Instructor

To be provided at a later date.

SFU BEEDIE SCHOOL OF BUSINESS

Segal Graduate School | Office of the Associate Dean, 500 Granville Street, Vancouver, BC V6C 1W6 | TEL 778.782.9255, FAX 778.782.5122 | busadmin@sfu.ca

Memo to SGSC

To: **Senate Graduate Studies Committee**
From: **Carolyn Egri, Acting Associate Dean, Graduate Programs**
Re: **Calendar and Curriculum Changes for Fall 2021**
Date: **February 3, 2021**

The following calendar and curriculum revisions have been approved by the Beedie School of Business and are being forwarded to the Senate Graduate Studies Committee for approval. These program changes should be effective for **Fall 2021**.

Please include the following on the next SGSC agenda.

~~Executive MBA~~

- ~~**Calendar Entry Change for Executive MBA: Removal of language in the Executive MBA calendar entry referring to the Indigenous Business and Leadership special cohort**~~

Graduate Certificate in Science and Technology Commercialization

- ~~**Calendar Entry Change for Graduate Certificate in Science and Technology Commercialization**~~
- **New Graduate Course Proposal: BUS 799**

Thank you for your attention herein. Should you have any questions or concerns, please do not hesitate to contact me.

Carolyn Egri

_____

Dr. Carolyn Egri
Acting Associate Dean, Graduate Programs
Beedie School of Business

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC)	Number (eg.810)	Units (eg. 4)
BUS	799	2

Course title (max. 100 characters)

Special Topics

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

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)

Course content varies from term to term, and can include emerging topics in Innovation and Entrepreneurship, such as technology market matching, viability analysis, techno-economic modeling, and strategic management of IP.

Rationale for introduction of this course

This course will be added to the i2I Program to provide additional depth and supervision to those who need it

Term of initial offering (eg. Fall 2019)	Course delivery (eg. 3 hrs/week for 13 weeks)
Fall 2021	3hrs/week for 8 weeks
Frequency of offerings/year	**Estimated enrollment per offering**
once/year	12

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 n/a

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?	Total repeats allowed?	Repeat within a term?
☑ Yes ☐ No	1	☐ Yes ☑ No
Required course?	**Final exam required?**	**Capstone course?**
☐ Yes ☑ No	☐ Yes ☑ No	☐ 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
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
Beedie, Graduate Programs	Elicia Maine	emaine@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair	Signature	Date

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	Signature	Date
Carolyn Egri	Carolyn Egri	16 February 2021

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		March 25, 2021

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

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

SFU FACULTY OF EDUCATION | GRADUATE STUDIES

MEMO

Graduate Studies

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ATTENTION: Senate Graduate Studies Committee

FROM: Dr. Lucy LeMare,
Associate Dean, Graduate Studies in Education

RE: Education Graduate Studies Course Change

DATE: February 2, 2021

The following graduate course change has been approved by the Faculty of Education and is forwarded to the Senate Graduate Studies Committee for approval. This curriculum item should be effective for the Fall 2021 term. Please include on the next SGSC agenda.

Faculty of Education

- ~~Change Master of Education in Educational Practice (MEd EP) program from a minimum of 35 units to 37 units~~
- ~~Change EDUC 883 (5 units) to EDUC 888 (7 units) and~~ approve EDUC 888 as a new course

Dr. Lucy LeMare
Associate Dean
Graduate Studies in Education

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) EDUC	Number (eg. 810) 888	Units (eg. 4) 7

Course title (max. 100 characters)

MEd Comprehensive Examination

Short title (for enrollment/transcript - max. 30 characters) Comp Exam

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)

The examination is graded on a satisfactory/unsatisfactory basis.

Rationale for introduction of this course

Per GPS request: replacing 883 (5) as this course needs to be 7 units specifically for the MEd EP program in order to be in compliance with the GGRs.

Term of initial offering (eg. Fall 2019) Fall 2021	Course delivery (eg. 3 hrs/week for 13 weeks) n/a
Frequency of offerings/year 2/year	Estimated enrollment per offering 20

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.

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
Michael Ling, Margaret MacDonald, Cher Hill
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
Education	Celeste Hambleton/Lucy LeMare	aps_program_manager@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee	Signature	Date
Department Chair	Signature	Date

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 (Not required)

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
Lucy LeMare	Lucy LeMare	January 30, 2021

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		March 25, 2021

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

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

SFU
FACULTY OF SCIENCE
Dean of Science

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MEMORANDUM

ATTENTION	Jeff Derksen, Dean of Graduate Studies	**DATE**	February 10, 2021
FROM	Michael Silverman, Associate Dean of Research and Graduate Studies	**PAGES**	1
RE:	Course changes – Actuarial Sciences		

Dear Dean Derksen,

The Faculty of Science has approved the following course changes effective for Fall 2021. Please include these items on the agenda for the next SGSC meeting.

Department of Statistics and Actuarial Science

1) ~~Pre-requisite changes: for STAT 642, 645, 652, 675, 685~~

2) Program changes including: They propose the creation of two new required actuarial courses ACMA 830 and 832, ~~renumbering the third required course ACMA 821 to ACMA 831, deletion of ACMA 820, and addition of three Statistics courses, STAT 831, 832 and 843, to the elective course list.~~

Michael A. Silverman, Ph.D.

SFU

MEMO

Joan Hu, Graduate Program Chair
Statistics & Actuarial Science
8888 University Drive
Burnaby, BC Canada
V5A 1S6

joanh@sfu.ca
www.sfu.ca/stat-actsci

ATTENTION:
Michael Silverman, Associate Dean of Science

TEL

FROM Joan Hu, Graduate Program Chair

RE Changes to be made into ActSci Graduate Program

DATE Feb 2, 2021

Department of Statistics & Actuarial Science

Motion 1: A set of changes into the current ACMA graduate program. Please see the enclosed file ``Program Change Form ACMA'' for a summary.

Rational for Motion 1: To respond to the comments/suggestions at the Department External Review in 2020.

Sincerely,

Joan Hu
Graduate Program Chair
Department of Statistics & Actuarial Scienc

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) ACMA	Number (eg. 810) 830	Units (eg. 4) 4

Course title (max. 100 characters)

Stochastic Processes for Insurance and Finance

Short title (for enrollment/transcript - max. 30 characters) Stochastic Processes

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)

General probability theory and stochastic processes. Information and conditioning. Stochastic differential equations. Financial econometrics models. Economic scenario generators. Advanced option pricing.

Rationale for introduction of this course

This course is part of the effort to modernize the graduate curriculum in actuarial science. The 2020 external review considered the structure of the existing program "extremely outdated" and identified the main failing as "the absence of financial mathematics or quantitative risk management". ACMA 830 is intended to address the former.

Term of initial offering (eg. Fall 2019) Fall 2021	Course delivery (eg. 3 hrs/week for 13 weeks) 4 hrs/week 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)

N/A

Prerequisite and/or Corequisite None

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:

STAT 490-3 Selected Topics in Probability and Statistics or ACMA 490-3 Selected Topics in Actuarial Science (extra work and lecture hour are required 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
Jean-François Bégin, Himchan Jeong, Barbara Sanders
Additional faculty members, space, and/or specialized equipment required in order to offer this course
N/A

CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
Statistics and Actuarial Science	Cary Tsai	cltsai@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee X. Joan Hu	Signature	Date 2020-02-02
Department Chair Tim Swartz	Signature Tim Swartz	Date Feb 2/21

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	Signature	Date
Michael Silverman	Michael A. Silverman	2.10.2021

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		March 25, 2021

ADMINISTRATIVE SECTION (for DGS office only)

Library Check: Yes

Course Attribute: _____

Course Attribute Value: _____

Instruction Mode: _____

Attendance Type: _____

If different from regular units:

Academic Progress Units: _____

Financial Aid Progress Units: _____

ACMA 830-4
Stochastic Processes for Insurance and Finance

Fall 2021
Day Course

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Jean-François Bégin

Prerequisites:
None

References:

- Hull, J. C. (2006). Options, Futures, and Other Derivatives. Pearson.
- Lyasoff, A. (2017). Stochastic Methods in Asset Pricing. The MIT Press.
- McDonald, R. L. (2006). Derivatives Markets. Pearson.
- Shreve, S. E. (2012). Stochastic Calculus for Finance I: The Binomial Asset Pricing Model. Springer Science & Business Media.
- Shreve, S. E. (2004). Stochastic Calculus for Finance II: Continuous-Time Models. Springer Science & Business Media.

Calendar Description:

General probability theory and stochastic processes. Information and conditioning. Stochastic differential equations. Financial econometrics models. Economic scenario generators. Advanced option pricing.

Outline:

This course covers stochastic processes and their applications to insurance and financial risks. The topics covered include:

- **Stochastic Processes**: probabilistic foundations, expectations, martingales, Brownian motion, stochastic integral, stochastic differential equations and Itô's lemma, jump processes.
- **Financial Econometrics Models:** asset models, parameter estimation.
- **Advanced Option Pricing:** discrete-time market models, Girsanov's theorem and fundamental theorems of asset pricing, replication strategies and martingale representation theorem, option pricing in practice.
- **Actuarial Applications:** economic scenario generators.

Grading Scheme:

Assignments: 30%
Projects and Presentations: 50%
Exam: 20%
All Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at http://students.sfu.ca/academicintegrity.html

ACMA 490-3: Selected Topics in Actuarial Science - Stochastic Processes for Insurance and Finance

Fall 2021
Day Course

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Jean-François Bégin

Prerequisites:
STAT 330

References:

- Hull, J. C. (2006). Options, Futures, and Other Derivatives. Pearson.
- Lyasoff, A. (2017). Stochastic Methods in Asset Pricing. The MIT Press.
- McDonald, R. L. (2006). Derivatives Markets. Pearson.
- Shreve, S. E. (2012). Stochastic Calculus for Finance I: The Binomial Asset Pricing Model. Springer Science & Business Media.
- Shreve, S. E. (2004). Stochastic Calculus for Finance II: Continuous-Time Models. Springer Science & Business Media.

Calendar Description:

General probability theory and stochastic processes. Information and conditioning. Stochastic differential equations. Financial econometrics models. Economic scenario generators. Advanced option pricing.

Outline:

This course covers stochastic processes and their applications to insurance and financial risks. The topics covered include:

- **Stochastic Processes**: probabilistic foundations, expectations, martingales, Brownian motion, stochastic integral, stochastic differential equations and Itô's lemma, jump processes.
- **Financial Econometrics Models:** asset models, parameter estimation.
- **Advanced Option Pricing:** discrete-time market models, Girsanov's theorem and fundamental theorems of asset pricing.
- **Actuarial Applications:** economic scenario generators.

Cross-listed with ACMA 830.

Grading Scheme:

Assignments: 30%
Projects and Presentations: 50%
Exam: 20%
All Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at http://students.sfu.ca/academicintegrity.html

STAT 490-3: Selected Topics in Probability and Statistics - Stochastic Processes for Insurance and Finance

Fall 2021

Day Course

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Jean-François Bégin

Prerequisites:
STAT 330

References:

- Hull, J. C. (2006). Options, Futures, and Other Derivatives. Pearson.
- Lyasoff, A. (2017). Stochastic Methods in Asset Pricing. The MIT Press.
- McDonald, R. L. (2006). Derivatives Markets. Pearson.
- Shreve, S. E. (2012). Stochastic Calculus for Finance I: The Binomial Asset Pricing Model. Springer Science & Business Media.
- Shreve, S. E. (2004). Stochastic Calculus for Finance II: Continuous-Time Models. Springer Science & Business Media.

Calendar Description:

General probability theory and stochastic processes. Information and conditioning. Stochastic differential equations. Financial econometrics models. Economic scenario generators. Advanced option pricing.

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- **Financial Econometrics Models:** asset models, parameter estimation.
- **Advanced Option Pricing:** discrete-time market models, Girsanov's theorem and fundamental theorems of asset pricing.
- **Actuarial Applications:** economic scenario generators.

Cross-listed with ACMA 830.

Grading Scheme:

Assignments: 30%
Projects and Presentations: 50%
Exam: 20%
All Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at http://students.sfu.ca/academicintegrity.html

SFU GRADUATE AND POSTDOCTORAL STUDIES

New Graduate Course Proposal

Course Subject (eg. PSYC) ACMA	Number (eg. 810) 832	Units (eg. 4) 4

Course title (max. 100 characters)

Actuarial Risk Management

Short title (for enrollment/transcript - max. 30 characters) Actuarial Risk Management

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)

Economic perspectives on risk and insurance. Risk measures. Extreme value theory. Multivariate risk models, copulas and dependence. Risk management in practice.

Rationale for introduction of this course

This course is part of the effort to modernize the graduate curriculum in actuarial science. The 2020 external review considered the structure of the existing program "extremely outdated" and identified the main failing as "the absence of financial mathematics or quantitative risk management". ACMA 832 is intended to address the latter.

Term of initial offering (eg. Fall 2019) Fall 2021	Course delivery (eg. 3 hrs/week for 13 weeks) 4 hrs/week 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)

N/A

Prerequisite and/or Corequisite None

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:

STAT 490-3 Selected Topics in Probability and Statistics or ACMA 490-3 Selected Topics in Actuarial Science (extra work and lecture hour are required 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
Barbara Sanders, Jean-François Bégin
Additional faculty members, space, and/or specialized equipment required in order to offer this course
N/A

CONTACT PERSON

Academic Unit / Program	Name (typically, Graduate Program Chair)	Email
Statistics and Actuarial Science	Cary Tsai	cltsai@sfu.ca

ACADEMIC UNIT APPROVAL

A course outline must be included.

Non-departmentalized faculties need not sign

Graduate Program Committee X. Joan Hu	Signature	Date 2020-02-02
Department Chair Tim Swartz	Signature Tim Swartz	Date Feb 2/21

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	Signature	Date
Michael Silverman	Michael A. Silverman	2.10.2021

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		March 25, 2021

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

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

ACMA 832-4
Actuarial Risk Management

Spring 2022
Day Course

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Barbara Sanders

Prerequisites:
None

References:

- Eeckhoudt, L., Gollier, C., Schlesinger, H. (2005). Economic and Financial Decisions under Risk. Princeton.
- McNeil, A.J., Frey, R., Embrechts, P. (2015). Quantitative Risk Management. Princeton.
- Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M. (2008). Modern Actuarial Risk Theory, Using R. 2nd edition. Springer.
- Hardy, M. (2003). Investment Guarantees: Modeling and Risk Management for Equity- Linked Life Insurance. Wiley.

Calendar Description:

Economic perspectives on risk and insurance. Risk measures. Extreme value theory. Multivariate risk models, copulas and dependence. Risk management in practice.

Outline:

This course focuses on concepts and tools related to risk management in the context of actuarial work. It covers the following topics:

- **Economic perspectives on risk and insurance:** utility theory, stochastic dominance and preference ordering, diversification and risk sharing.
- **Risk measures:** coherence, convexity, distortion risk measures and risk transforms, conditional and dynamic risk measures, time consistency, aggregate risk measures.
- **Extreme value theory.**
- **Multivariate risk models:** MVN distribution, elliptical distributions, copulas and dependence.
- **Risk management in practice:** premium principles and economic capital, capital allocation, static and dynamic hedging of economic risks, insurance products with embedded options: pricing and hedging, risk-based capital in insurance (Solvency II, LICAT), Monte Carlo simulation.

Grading Scheme:

Assignments: 30%
Paper summaries and presentations: 10%
Project and presentations: 30%
Exam: 30%
All Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at http://students.sfu.ca/academicintegrity.html

ACMA 490-3 Selected Topics in Actuarial Science - Actuarial Risk Management

Spring 2022
Day Course

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

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Instructor: Barbara Sanders

Prerequisites:
STAT 330

References:

- Eeckhoudt, L., Gollier, C., Schlesinger, H. (2005). Economic and Financial Decisions under Risk. Princeton.
- McNeil, A.J., Frey, R., Embrechts, P. (2015). Quantitative Risk Management. Princeton.
- Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M. (2008). Modern Actuarial Risk Theory, Using R. 2nd edition. Springer.
- Hardy, M. (2003). Investment Guarantees: Modeling and Risk Management for Equity- Linked Life Insurance. Wiley.

Calendar Description:

Topics in areas of probability and statistics not covered in the regular undergraduate curriculum of the department.

Outline:

This course focuses on concepts and tools related to risk management in the context of actuarial work. It covers the following topics:

- **Economic perspectives on risk and insurance:** utility theory, stochastic dominance and preference ordering.
- **Risk measures:** coherence, convexity, aggregate risk measures.
- **Extreme value theory.**
- **Multivariate risk models:** MVN distribution, elliptical distributions, copulas and dependence.
- **Risk management in practice:** premium principles and economic capital, capital allocation, static and dynamic hedging of economic risks, insurance products with embedded options: pricing and hedging, risk-based capital in insurance (Solvency II, LICAT), Monte Carlo simulation.

Cross-listed with ACMA 832.

Grading Scheme:
Assignments: 30%
Project and presentations: 40%
Exam: 30%
All Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at http://students.sfu.ca/academicintegrity.html

STAT 490-3 Selected Topics in Probability and Statistics - Actuarial Risk Management

Spring 2022
Day Course

Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Barbara Sanders

Prerequisites:
STAT 330

References:

- Eeckhoudt, L., Gollier, C., Schlesinger, H. (2005). Economic and Financial Decisions under Risk. Princeton.
- McNeil, A.J., Frey, R., Embrechts, P. (2015). Quantitative Risk Management. Princeton.
- Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M. (2008). Modern Actuarial Risk Theory, Using R. 2nd edition. Springer.
- Hardy, M. (2003). Investment Guarantees: Modeling and Risk Management for Equity- Linked Life Insurance. Wiley.

Calendar Description:

Topics in areas of probability and statistics not covered in the regular undergraduate curriculum of the department.

Outline:

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- **Economic perspectives on risk and insurance:** utility theory, stochastic dominance and preference ordering.
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- **Multivariate risk models:** MVN distribution, elliptical distributions, copulas and dependence.
- **Risk management in practice:** premium principles and economic capital, capital allocation, static and dynamic hedging of economic risks, insurance products with embedded options: pricing and hedging, risk-based capital in insurance (Solvency II, LICAT), Monte Carlo simulation.

Cross-listed with ACMA 832.

Grading Scheme:
Assignments: 30%
Project and presentations: 40%
Exam: 30%
All Grading is subject to change.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at http://students.sfu.ca/academicintegrity.html