MEMORANDUM

ATTENTION	Senate	**DATE**	December 3, 2021
FROM	Wade Parkhouse, Chair	**PAGES**	1/2
	Senate Committee on Undergraduate Studies		
RE:	Course Changes (SCUS 21-86)		

For information:

Acting under delegated authority at its meeting of December 2, 2021 SCUS approved the following curriculum revisions effective Fall 2022.

a. Faculty Applied Sciences

1. School of Computing Science

  (i) Description and prerequisite change for CMPT 305 (Spring 2023)
  (ii) Prerequisite change for CMPT 353 (Spring 2023)
  (iii) Prerequisite changes for CMPT 307, 308, 379, 404, 461 and 475

2. School of Engineering Science

  (i) Description and prerequisite change for ENSC 416

b. Beedie School of Business

  (i) Prerequisite change for BUS 462 and 466
  (ii) Description and prerequisite changes for BUS 465

c. Faculty of Communication, Art and Technology

1. School of Communication

  (i) Description change for CMNS 353, 431 and 453

2. <u>School of Interactive Art and Technology</u>

    (i) Equivalent statement change for IAT 359

d. Faculty of Environment

1. <u>School of Resource and Environmental Management</u>

    (i) B-Soc designation for REM 350 (***Summer 2022***)

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.

SFU
SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

COURSE SUBJECT	CMPT	**NUMBER**	305	**TITLE**	Computer Simulation and Modelling (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☒	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

~~This course is a~~<u>A</u>n introduction to the modelling, analysis, and computer simulation of complex systems. Topics include analytic modelling, discrete event simulation, experimental design, random number generation, and statistical analysis. Prerequisite: CMPT 225, (MACM 101 or (ENSC 251 and ENSC 252)) and (STAT 270 <u>or STAT 271</u>), all with a minimum grade of C-.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Spring 2023

November 2016

RATIONALE (must be included)

STAT 271 will be offered as an alternative to STAT 270 starting Fall 2022. Students would be able to use either STAT 270 or 271 as a pre-requisite requirement.

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COURSE SUBJECT	CMPT	**NUMBER**	353	**TITLE**	Computational Data Science (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Basic concepts and programming tools for handling and processing data. Includes data acquisition, cleaning data sources, application of machine learning techniques and data analysis techniques, large-scale computation on a computing cluster. Prerequisite: CMPT 225 and (STAT 101, STAT 270, STAT 271, ENSC 280, or MSE 210), with a minimum grade of C-.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Spring 2023

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

RATIONALE (must be included)

STAT 271 will be offered as an alternative to STAT 270 starting Fall 2022. Students would be able to use either STAT 270 or 271 as a pre-requisite requirement.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE SUBJECT	CMPT	**NUMBER**	307	**TITLE**	Data Structures and Algorithms (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under [Information about specific course components](#) if changing equivalent statement(s).

> Design and analysis of efficient data structures and algorithms. General techniques for building and analyzing algorithms (greedy, divide & conquer, dynamic programming, network flows). Introduction to NP-completeness. Prerequisite: CMPT 225, (MACM 201 <u>or CMPT 210</u>), (MATH 150 or MATH 151), and (MATH 232 or MATH 240), all with a minimum grade of C-. MATH 154 or MATH 157 with a grade of at least B+ may be substituted for MATH 150 or MATH 151.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

<mark>Fall 2022</mark>

November 2016

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

RATIONALE (must be included)

CMPT 210 will be offered as an alternative to MACM 201 starting Summer 2022. Students would be able to use either as the pre-requisite requirement.

SFU
SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

COURSE SUBJECT	CMPT	**NUMBER**	308	**TITLE**	Computability and Complexity (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Formal models of computation such as automata and Turing machines. Decidability and undecidability. Recursion Theorem. Connections between computability and logic (Gödel's Incompleteness). Time and space complexity classes. NP-completeness. Prerequisite: (MACM 201 or CMPT 210) with a minimum grade of C-.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

SFU

RATIONALE (must be included)

CMPT 210 will be offered as an alternative to MACM 201 starting Summer 2022. Students would be able to use either as the pre-requisite requirement.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE SUBJECT	CMPT	**NUMBER**	379	**TITLE**	Principles of Compiler Design (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

> This course covers the key components of a compiler for a high level programming language. Topics include lexical analysis, parsing, type checking, code generation and optimization. Students will work in teams to design and implement an actual compiler making use of tools such as lex and yacc. Prerequisite: (MACM <u>201 or CMPT 210)</u>, (CMPT 295 or ENSC 215) and CMPT 225, all with a minimum grade of C-.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

RATIONALE (must be included)

CMPT 210 will be offered as an alternative to MACM 201 starting Summer 2022. Students would be able to use either as the pre-requisite requirement.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

| **COURSE SUBJECT** | CMPT | **NUMBER** | 404 | **TITLE** | Cryptography and Cryptographic Protocols (3) |

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

| Course number | ☐ | Units | ☐ | Prerequisite | ☒ |
| Title | ☐ | Description | ☐ | Equivalent Statement | ☐ |

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

The main cryptographic tools and primitives, their use in cryptographic applications; security and weaknesses of the current protocols. The notion of security, standard encryption schemes, digital signatures, zero-knowledge, selected other topics. Prerequisite: (MACM 201 or CMPT 210) with a minimum grade of C-. CMPT 307 and 308 are recommended.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

November 2016

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

RATIONALE (must be included)

CMPT 210 will be offered as an alternative to MACM 201 starting Summer 2022. Students would be able to use either as the pre-requisite requirement.

SFU

COURSE SUBJECT	CMPT	**NUMBER**	461	**TITLE**	Computational Photography and Image Manipulation (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Computational Photography is concerned with overcoming the limitations of traditional photography with computation: in optics, sensors, and geometry; and even in composition, style, and human interfaces. The course covers computational techniques to improve the way we process, manipulate, and interact with visual media. The covered topics include image-based lighting and rendering, camera geometry and optics, computational apertures, advanced image filtering operations, high-dynamic range, image blending, texture synthesis and inpainting. Prerequisite: CMPT 361, <u>(</u>MACM 201 <u>or CMPT 210)</u>, and 316, all with a minimum grade of C-. Students with credit for CMPT 451 may not take this course for further credit.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

<mark>Fall 2022</mark>

SFU

RATIONALE (must be included)

CMPT 210 will be offered as an alternative to MACM 201 starting Summer 2022. Students would be able to use either as the pre-requisite requirement.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE SUBJECT | CMPT | **NUMBER** | 475 | **TITLE** | Requirements Engineering (3)

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number ☐   Units ☐   Prerequisite ☒

Title ☐   Description ☐   Equivalent Statement ☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under <u>Information about specific course components</u> if changing equivalent statement(s).

Software succeeds when it is well-matched to its intended purpose. Requirements engineering is the process of discovering that purpose by making requirements explicit and documenting them in a form amenable to analysis, reasoning, and validation, establishing the key attributes of a system prior to its construction. Students will learn methodical approaches to requirements analysis and design specification in early systems development phases, along with best practices and common principles to cope with notoriously changing requirements. Prerequisite: CMPT 275 or 276, <u>(</u>MACM 201 <u>or CMPT 210)</u>, all with a minimum grade of C- and 15 units of upper division courses. Recommended: Co-op experience.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

RATIONALE (must be included)

CMPT 210 will be offered as an alternative to MACM 201 starting Summer 2022. Students would be able to use either as the pre-requisite requirement.

SFU

COURSE SUBJECT | ENSC | **NUMBER** | 416 | **TITLE** | Engineering Electromagnetic II

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number ☐   Units ☐   Prerequisite ☒

Title ☐   Description ☒   Equivalent Statement ☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Introduction to boundary value problems, intermediate description of waves. Differential and integral forms of Maxwell equations. Transmission lines, co-axial cables, optical waveguides: antennas, Smith charts. Design of impedance matching networks ~~and filter synthesis~~. Reflection and transmission in complex networks. Cross-talk and interference in circuits. Prerequisite: ENSC 316 with a grade of at least C+ and MATH 254 with a minimum grade of C-.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

SFU

RATIONALE (must be included)

Math 254 is an essential pre-requirement for Ensc 416.

As Math 254 is NOT a pre-requirement for Ensc 316 it is possible to enroll in Ensc 416 without the completing this essential mathematic course.

Both Ensc 416 and Math 254 are required by Electronics option students thus one would not expect a student to prematurely enrol in Ensc 416. This however is not the case.

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COURSE SUBJECT BUS **NUMBER** 462 **TITLE** Business Analytics

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course
number ☐   Units ☐   Prerequisite ☒

Title ☐   Description ☐   Equivalent ☐
Statement

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

BUS 462 - Business Analytics (3)

Utilizes technology to support analysis and decision making abilities by identifying, analyzing and effectively reporting important business information. Concepts of data warehousing, data mining and visualizing data are introduced. A variety of software applications are used to demonstrate tools and techniques that support analysis and decision making for managers. Prerequisite: BUS 336, <u>BUS</u> 360W, <u>BUS 362,</u> ~~both~~ <u>all</u> with a minimum grade of C-; 60 units. Corequisite: BUS 336 can be taken concurrently.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

RATIONALE (must be included)

Level 300 courses should be taken before level 400 courses but students are able to take BUS 362 after completing all level 400 MIS courses at this time. BUS 362 prepares students in business process analysis and this knowledge is essential for all level 400 MIS courses. By adding BUS 362 as a prerequisite course for all level 400 MIS courses, students will have to complete BUS 362 before advancing to level 400 MIS courses.

SFU

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

COURSE SUBJECT | BUS | **NUMBER** | 466 | **TITLE** | Web-Enabled Business

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number ☐   Units ☐   Prerequisite ☒

Title ☐   Description ☐   Equivalent Statement ☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

BUS 466 - Web-Enabled Business (3)

Explores strategic issues and technologies in contemporary web-based business, from the evolution of business applications on the Internet through to contemporary Open Source and Web 2.0 applications. In depth exploration of new technology and business applications related to these technologies. Prerequisite: BUS 237, <u>BUS</u> 360W, <u>BUS</u> 362,~~both~~ <u>all</u> with a minimum grade of C-; 60 units.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

RATIONALE (must be included)

Level 300 courses should be taken before level 400 courses but students are able to take BUS 362 after completing all level 400 MIS courses at this time. BUS 362 prepares students in business process analysis and this knowledge is essential for all level 400 MIS courses. By adding BUS 362 as a prerequisite course for all level 400 MIS courses, students will have to complete BUS 362 before advancing to level 400 MIS courses.

SFU
SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

| **COURSE SUBJECT** | BUS | **NUMBER** | 465 | **TITLE** | Business Systems Development |

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

| Course number | ☐ | Units | ☐ | Prerequisite | ☒ |
| Title | ☐ | Description | ☒ | Equivalent Statement | ☐ |

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under [Information about specific course components](#) if changing equivalent statement(s).

BUS 465 - Business Systems Development (3)

~~This course will focus~~ <u>Focuses</u> on the practical application of business technology management knowledge and skills to develop business systems. Students will learn how to apply knowledge from prior MIS courses and develop applications for Internet-enabled businesses. ~~The students targeted are primarily Beedie MIS students who have preferably taken BUS 362 & BUS 464, in which they~~ **Students will** conceptualize ~~the~~ data and functional requirements for business software. The course will thus deepen skills in process logic, data management, and user interface design in business domains. Prerequisite: BUS 360W<u>, BUS 362, both</u> with a minimum grade of C-. Recommended: ~~BUS 362,~~ BUS 464, CMPT 354. Students with credit for BUS 492 (Summer 2017) may not take this course for further credit.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

| Fall 2022 |

SFU

RATIONALE (must be included)

Level 300 courses should be taken before level 400 courses but students are able to take BUS 362 after completing all level 400 MIS courses at this time. BUS 362 prepares students in business process analysis and this knowledge is essential for all level 400 MIS courses. By adding BUS 362 as a prerequisite course for all level 400 MIS courses, students will have to complete BUS 362 before advancing to level 400 MIS courses.

SFU

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

| **COURSE SUBJECT** | CMNS | **NUMBER** | 353 | **TITLE** | Topics in Technology and Society |

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number ☐   Units ☐   Prerequisite ☐

Title ☐   Description ☒   Equivalent Statement ☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Examination of the emergence and shaping of information and communication technologies in the digital age. Explores new media and social change between everyday life, social institutions, and various enterprises. Emphasis is placed on social context and relations of power. This course can be repeated once for credit <u>if second topic is different</u> (up to a maximum of two times).

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

RATIONALE (must be included)

We would like to explicit how many times students can take this course for credits.

SFU

COURSE SUBJECT | CMNS | **NUMBER** | 431 | **TITLE** | News Research and Analysis

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☐
Title	☐	Description	☒	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

> Applied research seminar using <u>traditional or digital</u> techniques of textual and contextual analysis <u>of news media</u> ~~to test media themes~~ and explore patterns of coverage and omission. ~~in Canada's news media. Students may have an opportunity to publicize their work through the NewsWatch Canada Project.~~ Prerequisite: 60 units, including one of CMNS 235 or 331, with a minimum grade of C- and CMNS 201W (or 201) with a minimum grade of C-.

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

RATIONALE (must be included)

> The new description is more inclusive than the previous one, and it addresses the recent changes made to the course as Canada NewsWatch project is no longer functional.

SFU

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

COURSE SUBJECT	CMNS	**NUMBER**	453	**TITLE**	Issues in the Information Society

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number ☐   Units ☐   Prerequisite ☐

Title ☐   Description ☒   Equivalent Statement ☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Advanced seminar to discuss issues in the interplay between contemporary society and new computer/communication technologies, at the level of comprehensive theories of society, on one hand, and major public policy, on the other. This course can be repeated once for credit if second topic is different (up to a maximum of two times).

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

Fall 2022

RATIONALE (must be included)

We would like to explicit how many times students can take this course for credits.

November 2016

SFU

COURSE SUBJECT | IAT | **NUMBER** | 359 | **TITLE** | Mobile Computing

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☐
Title	☐	Description	☐	Equivalent Statement	☒

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using <u>underline</u>. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under <u>Information about specific course components</u> if changing equivalent statement(s).

> IAT 359 Mobile Computing (3)
>
> An introduction to mobile computing and the development of applications for mobile environments. The three areas that will be covered in the course are mobile technologies, application development and user interaction in a mobile setting. Students will make use of mobile application frameworks and development environments to develop their own application and project, while reinforcing concepts covered in the lectures. Topics covered include mobile development environments, user interfaces, user experience and application development guidelines, gesture recognition, location, sensors, and graphics, and others, as will be outlined in the weekly schedule.
>
> Prerequisite: Completion of 48 units, including IAT 265 and IAT 267, with a minimum grade of C-.
>
> <u>Students with credit for CMPT-362 cannot take IAT-359 for further credit.</u>

EFFECTIVE TERM AND YEAR FOR CHANGES
Fall, Spring, Summer and year (please enter in textbox)

> Fall 2022

RATIONALE (must be included)

> There is significant overlap identified between the newly proposed CMPT-362 (Mobile Applications Programming and Design) with the existing IAT-359 (Mobile Computing) as part of the course overlap check. It was determined that students should not be able to take both for credit even though pre-requisites would likely make it difficult to do so for most students.

UNIVERSITY CURRICULUM AND INSTITUTIONAL LIAISON
OFFICE OF THE VICE-PRESIDENT, ACADEMIC

MEMORANDUM

ATTENTION	SCUS	**DATE**	November 23, 2021
FROM	Jill Sutherland, Director University Curriculum & Institutional Liaison	**PAGES**	1
RE:	FENV REM 350 Breadth Designation		

The University Curriculum Office has approved the Breadth Social Sciences designation for the following Resource and Environmental Management (REM) course, effective Summer 2022 (1224):

REM 350 Energy Management for a Sustainable Climate and Society – B-Soc

Please forward this memo to Senate for further approvals.

cc: Paul Kingsbury, Associate Dean, Undergraduate, FENV

SIMON FRASER UNIVERSITY   ENGAGING THE WORLD

B-COURSE CERTIFICATION REQUEST

Thank you for your interest in planning and offering a Designated Breadth (B) course. Designated Breadth courses will help meet Simon Fraser University's commitment to the education of undergraduate students as defined by the new curriculum. This form is intended to:

- determine whether proposed or existing courses meet the B criteria;
- estimate the number of B seats available to students;
- assist faculty to think through the elements of a B course

This form is divided into TWO sections:

Section I requests instructor, program and course information;
Section II requests detailed course content information.

Please contact Jill Sutherland at ucil_director@sfu.ca if you have any questions about completing this form. Completed forms can be sent electronically to the email address and to ucil_office@sfu.ca

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Course Title: Energy Management for a Sustainable Climate and Society
Course # (if known): REM 350

Is the course (double-click the applicable box, select "checked" from the Default Value and click "OK"):

☐ a new course?

☐ a modification of an existing course to broaden its focus to meet the B criteria?

☐ a course that has previously been piloted as a B course?

☒ an existing course that fulfills the B criteria for certification?

To be considered, this form must be approved by the Chair/Director of your program and by the Associate Dean of your Faculty. Please have them sign off as noted below, or send an email confirmation to ucil_director@sfu.ca.

Chair/Director: _P. Hözeli_____ Date approved: November 16, 2021

Associate Dean: _Paul Kingsbury_____ Date approved: November 19, 2021

This application has been reviewed by the UCIL Office and approved by the Senate Committee on Undergraduate Studies (SCUS).

UCIL Director: _Jill Sutherland_____ Date reviewed: November 23, 2021

SCUS Chair: _____ Date approved: _____

Section I

INSTRUCTOR/PROGRAM INFORMATION

Name of Instructor(s): Dr. Mark Jaccard

Department: School of Resource and Environmental Management

E-mail: jaccard@sfu.ca Telephone: 778 789 0852

If not the instructor named above, who will develop or revise the course?

If the course has multiple instructors, how will the department ensure that the varying course content will routinely meet the B criteria?

COURSE ENROLMENT AND OFFERING INFORMATION

If this is a new or modified course:
- when will it first be offered?
- how often will it be offered?
- what is the expected enrolment per offering?

If this is an existing course:
- how often is it offered? Once or twice per year
- what is the current average enrolment per offering? 125 students
- what is the expected enrolment increase, if relevant, with B designation? 175

Section II

<div style="background-color: yellow;">

THE B CRITERIA

Designated Breadth (DB) courses expose students to new theoretical perspectives, forms of thought and modes of enquiry. To qualify as a DB course, a course should be intellectually accessible to "non-majors"; that is, students' ability to master the course content should not depend on bringing to it the kind of specialized knowledge typically possessed by students majoring in a discipline. <u>Although most DB courses will be introductory in nature, upper-division courses may qualify as DB courses if they do not require students to have specialized knowledge or specific prerequisites.</u>

In addition, a DB course should substantially fulfill AT LEAST ONE of the following three conditions:

1. It explicitly addresses how and why a discipline (or disciplines) defines, acquires and organizes knowledge in particular ways; it identifies important questions and problems in the discipline (or disciplines) and describes procedures used to generate valid answers to the questions or workable solutions to the problems.

2. It is designed to give students a broad understanding of the historical development and/or the contemporary dynamics of the physical, natural, social and/or cultural environments.

3. It provides a survey of a substantial body of the knowledge, theories and/or controversies that are deemed to be central to a discipline (or disciplines).

</div>

Please give a one-paragraph description of the content of the course, and provide a syllabus (if available).

REM 350 offers a multi-disciplinary and transdisciplinary exploration of how to manage society's energy and materials flows in a sustainable matter. The course provides students from diverse backgrounds with an understanding of a) how humans are disrupting the planet's energy and material flows, b) our thermodynamic, geological and biological options for reducing this disruption, c) the environmental, economic and social implications of pursuing these options, and d) helpful institutional and governmental changes at local, national, and global levels. The course includes a diversity of readings, including the instructor's latest book, ***The Citizen's Guide To Climate Success: Overcoming Myths That Hinder Progress***. (Free online at Open Access on Cambridge Core at doi.org/10.1017/9781108783453.)

By definition, Designated Breadth courses address general issues and introductory content (i.e. non-specialist). Therefore, it will be rare for a Breadth course to have multiple or upper-level prerequisites. **Please list prerequisites, if the course has any.**

The course has no prerequisites, but it requires students to be in (or almost in) upper division (45 credits completed) because they must have the ability to absorb and integrate information from a diversity of disciplines.

All Designated Breadth courses are assigned to one (or more) of the Breadth areas: Humanities, Science and/or Social Science. Please identify the area(s) that seems most appropriate to the content of your course and answer the following questions, clarifying how the B criteria pertain to each of these areas. (For example, a course in Psychology could be designated as B-Soc or B-Sci, or both, depending on its approach to the subject matter.)

Which Breadth requirement(s) is the course designed to satisfy?   ☐ B-Hum   ☐ B-Sci   ☒ B-Soc

1. Explain how this course explicitly addresses how and why a Humanities/Science/Social Science discipline (or disciplines) defines, acquires and organizes knowledge in particular ways; it identifies important questions and problems in the Humanities/Science/Social Science and describes the procedures used to generate valid answers to the questions or workable solutions to the problems.

REM 350 aims to equip students with the necessary understanding and knowledge to become informed citizens and meaningfully contribute to the energy transition for a more sustainable future. The course examines the topic from a variety of perspectives challenging common assumptions and misconceptions (see response to Question 2 for more detail). In addition to the knowledge transfer, the problem-focused presentation of the material in the course teaches students how a wicked environmental problem like the energy transition can be approached in a systematic way and how an in-depth understanding the natural, social and economic components of the system combined with empirical data can provide powerful guidance on how to implement the necessary transition in an effective and equitable way. I therefore strongly believe that the approach presented in this course provides critical citizen skills to students of all background.

2. Explain how this course introduces important concepts for understanding the historical development and/or contemporary dynamics of:

   - our Western and/or non-Western heritage of thought and culture (Humanities);
   - the physical, natural, and/or technological environments we inhabit (Science);
   - the social environments we inhabit (Social Science).

While the course also teaches some basic physics (1st and 2nd law of thermodynamics and 1st and 2nd law efficiencies), engineering (understanding and assessment of critical technologies like renewables, nuclear, large hydro, energy storage, carbon capture and storage, solar reflection), environment (material and energy flows, including wastes), and earth sciences (energy resource characteristics and global distribution), it especially focuses on the following social sciences – economics, political science, public policy, diplomacy, business, planning, sociology and behavioural psychology.

From the economics and business disciplines, students explore how resource prices are determined (supply and demand, including differential and scarcity rent for the future economic prospects of resources like the oil sands), how to conduct cost-benefit and cost-effective analysis (including an assigned spreadsheet analysis of the Site C dam or a windfarm, and the personal decision to buy an electric car or take transit), and how to assess the full cost of energy efficiency (including rebound effects) and renewable electricity (including variability and energy storage costs).

From the political science and public policy disciplines, students explore how the governance system (democratic vs autocratic) and electoral system (proportional representation vs plurality) and political and policy biases fostered and reinforced by modern communications and media ("carbon taxes are inevitably punitive", "climate science is uncertain", etc.) cause real-world political constraints for sustainability policy-making, and they explore how to partly overcome some of these challenges via innovations in flexible regulatory policies, institutional reforms and possibly electoral reforms. In this area, students also explore the special diplomatic challenges of achieving a coordinated and continuous international effort with global collective action problems like GHG emissions today and other sustainability threats tomorrow (oceans, scarce minerals, land fertility, material waste management).

From the urban planning, sociology and behavioural psychology disciplines, students explore the potentials and challenges of efforts at mass behavioural change for environmental sustainability and social equity, such as fostering changes in meat consumption, personal vehicle use, air travel and non-essential goods consumption. They also explore the role of physical structures (like urban form that results from planning, land-use zoning, building codes and infrastructure investment) in making some behavioural changes toward sustainability easier to advance (safe bike lanes, rewarding walking paths, higher density mixed use coordinated with public transit nodes, mixed income housing, green building design), both from an environmental perspective and a social equity perspective.

Overall, the course provides an exploration of applied knowledge from several social science disciplines for students who might otherwise never experience these key concepts in their specialized disciplinary studies. This learning experience will empower them in their careers but also as engaged citizens in making a contributing with the great sustainability challenges facing humanity today and in future.

3. Explain how this course provides a survey of a substantial body of the knowledge, theories and/or controversies that are deemed central to a Humanities/Science/Social Science discipline or disciplines.

As highlighted in my response to Question 2, REM 350 provides an extensive, trans-disciplinary perspective on the great environmental sustainability challenges of today. The course balances both theoretical considerations and practical perspectives to help students from all backgrounds to better understand the complexity of the problem at hand and empower them to use the knowledge they gain in this course to contribute to a successful global effort to prevent further climate harms.

4. Describe any other ways in which this course meets the goals and criteria of a Designated Humanities/Science/Social Science Breadth course.

I provide in the answers above considerable evidence showing the great extent to which this course meets the goals and criteria of a Social Science Breadth course.

REM 350-4: Energy Management for a Sustainable Climate and Society

Spring 2022

Instructor: Mark Jaccard, Resource and Environmental Mgmt (jaccard@sfu.ca)
Prerequisites: 45 credit hours or permission of the instructor
Course delivery: Online and in-person options, Burnaby and Surrey campuses
Lecture delivery: Asynchronous. Lectures will be held online via ZOOM Wed-11:30-12:20 and Fri-10:30-12:20 with optional live attendance at Burnaby campus. Lectures will be recorded and posted on CANVAS for later viewing. Attendance at synchronous lectures is NOT required.
Tutorial: Synchronous

Course objective & content
The course takes an interdisciplinary approach to providing students from diverse backgrounds with an understanding of:
- how humans are disrupting the planet's energy and material flows;
- our thermodynamic, geological and biological options for reducing this disruption;
- the environmental, economic and social implications of pursuing these options; and
- helpful institutional and governmental changes at local, national, and global levels.

At an introductory level, the course includes sequential study of: (1) causes and effects of greenhouse gas emissions, (2) thermodynamic and other methods for assessing human-environment sustainability, (3) global distribution of energy resources, (4) technologies for preventing or correcting disruptions to the carbon cycle caused by our energy systems, (5) methods for calculating the cost of alternative technologies for energy efficiency, energy supply and energy demand, (6) strategies for overcoming human cognitive biases and asymmetries in socio-economic power that create political, policy and diplomatic challenges for addressing the global collective action problem of reducing, preventing and extracting atmospheric GHGs.

While there will be additional reading material, the course is largely based upon a new book by the instructor: ***The Citizen's Guide for Climate Success: Overcoming Myths that Hinder Progress***. The book is free online at Open Access on Cambridge Core at doi.org/10.1017/9781108783453.

Additional reading materials and lecture slides available at the CANVAS course site.

Some of the questions explored in the course
Can current or even substantially higher human-related flows of energy and materials be sustainable?
Are peak oil or peak phosphorous useful concepts?
Are energy efficiency investments profitable?
Will renewables soon be a cheaper source of energy than fossil fuels?
How do we define behavioral change for sustainability and what is the potential?
How do we compare between renewables, nuclear and carbon capture & storage?
Must energy systems be decentralized and small scale to be sustainable?
How do we evaluate alternative policies for sustainability?
What institutions and policy processes are needed for rapidly scaling-up renewables?
Is carbon neutrality a useful target and are offsets a useful policy contribution?
How do we assess geo-engineering as an option for addressing the climate change risk?
How can we achieve the necessary global effort against the climate risk?
What mechanisms within and between nations can rapidly provide energy access to 2 billion people?

What is economic growth, and can it be sustained indefinitely?
How can research into human cognition help with sustainable energy policy design?
What role, if any, for civil activism in advancing sustainability?

Student Assessment

First mid-term	25%
Second mid-term	25%
Final exam	35%
Tutorial participation	15%