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MEMORANDUM

ATTENTION	Senate	DATE	July 4, 2014
FROM	Gordon Myers, Chair	PAGES	1/1
RE:	Senate Committee on Undergraduate Studies Faculty of Applied Sciences (SCUS 14-27)		

For information:

Acting under delegated authority at its meeting of July 3, 2014 SCUS approved the following curriculum revisions effective Summer 2015.

1. School of Computing Science (SCUS 14-27a)

(i) Requirement changes to the Software Systems Program

2. School of Engineering Science (SCUS 14-27b)

(i) Changes to the:

- Continuation requirements for the Co-operative Education Work Experience
- Unit requirements for all 400 level ENSC courses
- Internal transfer GPA

(ii) Addition of new elective category – Engineering Science and Design (ESD) electives

(iii) Prerequisite changes to ENSC 424, 425, 427, 428, 429, 450, 452, 472, 474, 481, 483, 488, 489



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MEMORANDUM

ATTENTION Senate
FROM Gordon Myers, Chair
Senate Committee on
Undergraduate Studies
RE: Faculty of Applied Sciences (SCUS 14-34)

DATE August 8, 2014
PAGES 1/1

For information:

Acting under delegated authority at its meeting of August 7, 2014 SCUS approved the following curriculum revisions.

1. School of Engineering Science (SCUS 14-34a)

- (i) New Course Proposal: ENSC 482-4, Introduction to Decision Making in Engineering effective Spring 2016.
- (ii) Credit, prerequisite, description change to ENSC 220, 252, 254, 280, 325, 327, 328, 350, 351, 387, 424, 427, 440W, 474, 483, 488 and 495 effective Summer 2015.
- (iii) Course deletion ENSC 305 effective Summer 2015

2. School of Mechatronic Systems Engineering (SCUS 14-34b) effective Summer 2015

- (i) Credit change for MSE 221, 222, 223, 250, 320 and 321
- (ii) Credit change for MSE 420 – 427, 450, 480, 481 and 483



FACULTY OF APPLIED SCIENCES

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MEMORANDUM

ATTENTION	Senate Committee on Undergraduate Studies	DATE	June 23, 2014
FROM	Ed Park, Associate Dean	PAGES	
RE:	Calendar Changes for SOSY Program		

The following changes have been approved by the FAS Undergraduate Curriculum Committee and are appended here for approval by SCUS and recommendation to Senate.

- 1.) School of Computing Science
 - a) SOSY Program Calendar Change
- 2.) School of Engineering Science
 - b) Calendar Changes
 - i. Creation of "Continuation Requirements" for individual options
 - ii. Minimum unit requirement for 400 level courses
 - iii. Internal transfer requirement
 - iv. Addition of new elective category - Engineering Science and Design (ESD)Electives
- 3.) Course Pre-requisite Changes
 - a) ENSC 424
 - b) ENSC 425
 - c) ENSC 427
 - d) ENSC 428
 - e) ENSC 429
 - f) ENSC 450
 - g) ENSC 452
 - h) ENSC 472
 - i) ENSC 474
 - j) ENSC 481
 - k) ENSC 483
 - l) ENSC 488
 - m) ENSC 489

Thank you,

A handwritten signature in black ink, appearing to read 'Edward Park', written over a horizontal line.

Edward Park
Associate Dean

(EP/mt)

School of Computing Science Memorandum

From: Richard Vaughan, Director of Undergraduate Programs
To: Ed Park, FAS Associate Dean
Subject: **Modifications to the Software Systems Program: calendar change**
Date: 9 June, 2014

We submit calendar changes for these programs:

1. Software Systems

These changes have been approved by the CMPT UPC.

Proposal 1: Make CMPT 371 *Data Communications And Networking* a required course in the Software Systems program.

Motivation: The Software Systems instructional team and the CS UPC believes that networking is a fundamental part of modern computing that we unanimously voted to require it as part of Software systems. The change moves 371 from an elective to a required class.

The class is usually offered 2 or 3 times a year.

Proposal 2: Add CMPT 431 *Distributed Systems* to the list of permissible electives in the Systems courses.

Motivation: This course offers relevant material not currently covered in the program and is regularly taught by (amongst others) a Systems member of the SoSy instruction team.

The class is usually offered twice a year.

The following pages implement the calendar change language.

SOFTWARE SYSTEMS MAJOR

(<http://www.sfu.ca/students/calendar/2014/spring/programs/software-systems/major/bachelor-of-science.html>)

EXISTING TEXT	NEW TEXT
Systems Requirements	Systems Requirements
Students complete at least 18 units, including all of	Students complete at least 18 units, including all of
CMPT 150 - Introduction to Computer Design (3)	CMPT 150 - Introduction to Computer Design (3)
CMPT 250 - Introduction to Computer Architecture (3)	CMPT 250 - Introduction to Computer Architecture (3)
CMPT 300 - Operating Systems I (3)	CMPT 300 - Operating Systems I (3)
MSE 110 - Mechatronics Design I (3)	CMPT 371 - Data Communications and Networking (3)
and two of	MSE 110 - Mechatronics Design I (3)
CMPT 170 - Introduction to Web Application Development (3)	and one of
CMPT 354 - Database Systems I (3)	CMPT 170 - Introduction to Web Application Development (3)
CMPT 371 - Data Communications and Networking (3)	CMPT 354 - Database Systems I (3)
CMPT 433 - Embedded Systems (3)	CMPT 431 - Distributed Systems (3)
CMPT 454 - Database Systems II (3)	CMPT 433 - Embedded Systems (3)
CMPT 470 - Web-based Information Systems (3)	CMPT 454 - Database Systems II (3)
CMPT 471 - Networking II (3)	CMPT 470 - Web-based Information Systems (3)
	CMPT 471 - Networking II (3)

SCUS PROPOSALS:

Proposal 1: Creating preventative mechanisms that will help ensure that students

Rationale: 1) seek co-op placements earlier in their degree to prevent them from trying to graduate on a co-op. 2) Senior students without any work experience are difficult to place

Proposal 2: Added the prerequisite requirement of a minimum of 80 units to all 400-level ENSC courses, excluding those that already have a minimum unit requirement (e.g. ENSC 412 and ENSC 440). We have attached all of the necessary course change forms.

Rationale: This prevents second-year students from registering in 4th year classes. There have been several cases of this in specialized elective courses where they do not have the maturity and experience to handle the upper-level material.

SUMMER

For the Spring 2015 Calendar:

The following is to be added to all of our Undergraduate Major programs (Computer Engineering, Electronics, Engineering, Systems Option) and our Honours programs (Biomedical Engineering, Computer Engineering, Electronics Engineering, Engineering Physics, Systems Option).

We are adding a new heading entitled "Continuation Requirements" between the "Co-operative Education Work Experience" heading and the "Program Requirements" heading. Under this new heading will be the subheading "Upper Division"

OLD: Co-operative Education Work Experience An optional non-technical work term (ENSC 194) is also available through the engineering science co-operative education office and is often completed after the first two study terms. ENSC 194 does not count toward the mandatory three course requirement. Program Requirements Students complete the engineering science core course requirements as shown below, which includes additional course requirements for this computer engineering option. These courses provide basic science, general studies, engineering science, specialized engineering and science, and project and laboratory work.	NEW: Co-operative Education Work Experience An optional non-technical work term (ENSC 194) is also available through the engineering science co-operative education office and is often completed after the first two study terms. ENSC 194 does not count toward the mandatory three course requirement. Continuation Requirements (NEW HEADING) Upper Division (NEW SUB-HEADING) <i>To be eligible to enrol in upper division engineering courses, excluding ENSC 320, students must have declared their option. Before a student can declare their option, they must have successfully completed at least one co-op term (ENSC 194, ENSC 195, or ENSC 196).</i> Minimum of 80 units required for all 400-level courses. Exceptions: Courses such as ENSC 440W that already have a minimum of 100 units requirement. Program Requirements Students complete the engineering science core course requirements as shown below, which includes additional course requirements for this computer engineering option. These courses provide basic science, general studies, engineering science, specialized engineering and science, and project and laboratory work.
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Proposal 3: Add the following prerequisite statement to ENSC courses to align with computing science 300 and 400 level courses:

Rationale: To provide an incentive for students to get their CGPA above 2.4. As noted by coop, it is almost impossible to find coop positions for students with CGPA below 2.4. This measure does not stop lower-CGPA students from advancing but requires them to see an advisor about their performance in the program. We will be sending out warning emails to students in second year with GPAs of 2.5 or less to remind them of this restriction and provide waivers for the 12 credit hour minimums to enable students to pull up their GPAs. Also several shadow students (non FAS students) have been able to register in the upper-level ENSC courses with very low CGPA. This measure ensures that only outside students eligible for transfer to ENSC can take these upper-level courses.

SUMMER

For the ~~Spring~~ 2015 Calendar:

The following is to be added to all of our Undergraduate Major programs (Computer Engineering, Electronics, Engineering, Systems Option) and our Honours programs (Biomedical Engineering, Computer Engineering, Electronics Engineering, Engineering Physics, Systems Option).

OLD:	NEW:
Minimum Grade Point Averages The program requires a cumulative grade point average (CGPA) and an upper division grade point average (UDGPA) each of at least 2.0 in accordance with University graduation requirements.	Minimum Grade Point Averages The program requires a cumulative grade point average (CGPA) and an upper division grade point average (UDGPA) each of at least 2.0 in accordance with University graduation requirements. <i>Minimum 2.4 CGPA is required for direct registration in upper division courses. Faculty of Applied Science students with a CGPA below 2.4 need to see an advisor to register in these courses. Other Faculties' students may not register with a CGPA below 2.4.</i>

Proposal 4: An increase in our internal transfer GPA based on an “engineering related GPA” (ERGPA)

Rationale: We are raising the internal transfer GPA to 2.5 as we have a mandatory coop program and are having great difficulty placing students with GPAs under 2.4. Furthermore, many of the students provide us with internal GPAs.

SUMMER

For the Spring 2015 Calendar:

The following is to be added to all of our Undergraduate Major programs (Computer Engineering, Electronics, Engineering, Systems Option) and our Honours programs (Biomedical Engineering, Computer Engineering, Electronics Engineering, Engineering Physics, Systems Option).

OLD:	NEW:
Internal Transfer from another program within SFU	Internal Transfer from another program within SFU
Simon Fraser University students who wish to transfer to Engineering Science from another program must have a Simon Fraser University cumulative grade point average (CGPA) of at least 2.25 with fewer than 6 repeated courses. In addition, in the term prior to requesting the transfer to the School of Engineering Science, the student must have been enrolled in at least 12 Simon Fraser University credits and earned a term GPA of 2.25 or higher	Simon Fraser University students who wish to transfer to Engineering Science from another program must have an <u>engineering related grade point average (ERGPA) at</u> Simon Fraser University of at least <u>2.5</u> with fewer than 6 repeated courses. In addition, in the term prior to requesting the transfer to the School of Engineering Science, the student must have been enrolled in at least 12 Simon Fraser University credits and earned a term GPA of <u>2.5</u> or higher <i>Simon Fraser University students applying for admission to the School of Engineering Science are selected for admission on the basis of an engineering-related grade point average (ERGPA). The ERGPA is calculated over all courses the student has taken from this list, where a minimum of 3 courses from this list is required, such that:</i> <i>• at least one mathematics course chosen from MATH 151 (or 150), MATH 152, MATH 232</i>

	(or 240), MACM 101, MACM 201 • at least one computing course chosen from CMPT 128 or 135 or (125 and 127), 225, and 275 • at least one physics courses chosen from PHYS 120 (or 140), PHYS 121 (or 141), PHYS 221, PHYS 321, PHYS 365 • additional courses may include: CHEM 121 <i>All three courses must be completed prior to application. For complete information, contact an Applied Sciences Advisor. If a course is a duplicate of any previous course completed at Simon Fraser University or elsewhere, only the last attempt will be included in the average. Admission is competitive and the admission average is established on a per term basis, depending on the number of spaces available.</i>
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Proposal 5: A new term for upper division electives is needed in the new curriculum as some of these may not be ENSC electives, but need to fulfill the specific engineering science and design requirements from CEAB. The proposed term is "*Engineering Science and Design*" electives. This will be added on the "Engineering Science, Computer Engineering Major" and "Engineering Science, Computer Engineering Honours" web pages under the heading "Elective Course Requirements"

Rationale: Where possible, we would like to provide more elective choices for our students. For example, Engineering Science does not have many Computer Engineering specific electives. As such, we want to allow our students to take some Computer Science electives as part of the new curriculum.

For the Summer 2015 Calendar:

The following is only to be added to our Computer Engineering Undergraduate Major program and our Computer Engineering Honours program.

OLD: Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses	NEW: Elective Courses In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses <i>Engineering Science and Design (ESD) Electives (New Sub-heading)</i> <i>Engineering Science and Design (ESD) Electives may be offered by departments other than the School of Engineering Science, but they must satisfy the Canadian Engineering Accreditation Board (CEAB) engineering science and engineering design requirements. Generally, Engineering Science has roots in mathematics and basic sciences, but carries knowledge further toward creative applications that could include simulation, experimental procedures, modelling and the development of mathematical or numerical techniques. Application to the identification and solution of practical engineering problems is stressed.</i> <i>Engineering Design requires students to demonstrate an ability to design solutions for complex, open- ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.</i> <i>Each option has a pre-approved list of electives that may include one or more</i>
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	<i>pre-approved ESD electives. Note that these courses may have pre-requisites not required for your option; these pre-requisites would still need to be taken in order to enrol in the elective.</i> <i>Students interested in taking an ESD elective course that does not appear on this list should contact the Chair of their option/Undergraduate Curriculum Committee and obtain his/her approval in writing before proceeding with the course.</i>
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Proposal 6: Course Change forms (associated with Proposal 2 to support the addition of the minimum of 80 units requirement to all 4th year courses excluding ENSC 412 and ENSC 440)

Course Change forms:

ENSC 424
 ENSC 425
 ENSC 427
 ENSC 428
 ENSC 429
 ENSC 450
 ENSC 452
 ENSC 472
 ENSC 474
 ENSC 481
 ENSC 483
 ENSC 488
 ENSC 489



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 424 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 380.

PREREQUISITE

TO: ENSC 380 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
Spring 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 425 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 320, 325 and 380. **TO:** ENSC 320, 325 and 380, and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year SUMMER
Spring 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 427 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 327 or permission of instructor **TO:** ENSC 327 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
Spring 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 428 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 327.

PREREQUISITE

TO: ENSC 327 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
~~Spring~~ 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM **TO**
Course Subject/Number ENSC 429 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 327 or 328, and 380.

PREREQUISITE

TO: (ENSC 327 or 328), ENSC 380, and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
Spring 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM **TO**
Course Subject/Number ENSC 450 Course Subject/Number _____
Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 225 and ENSC 350.

PREREQUISITE

TO: ENSC 225 and ENSC 350, and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
Spring 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM **TO**
Course Subject/Number ENSC 452 Course Subject/Number _____
Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 350 and ENSC 351.

PREREQUISITE

TO: ENSC 350 and ENSC 351, and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year SUMMER
Spring 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 472 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 372, KIN 201, 308, 448.

PREREQUISITE

TO: ENSC 372, BPK 201, 308, 448. and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
Spring 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 474 Course Subject/Number same

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?

If so, this should be **noted in the prerequisite**.

FROM: Prerequisite: CMPT 128, 225 (or permission of the instructor), and ENSC 380.

PREREQUISITE

TO: CMPT 128, 225 (or permission of the instructor), ENSC 380, and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
~~Spring~~ 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 481 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **DESCRIPTION TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 330 **TO:** ENSC 330 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year Summer
Spring 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 483 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 383 or MSE 383.

PREREQUISITE

TO: ENSC/MSE 383 or MSE 381, and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

MSE equivalents are being added to the list of acceptable prerequisites.

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

SUMMER
~~Spring~~ 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 488 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 383.

PREREQUISITE

TO: ENSC 383 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

Summer
Spring 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 489 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 380.

PREREQUISITE

TO: ENSC 380 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

In an effort to prevent second year students from registering in fourth year classes we would like to add a minimum credit requirement to all 4XX ENSC courses.

Effective term and year

Summer
Spring 2015

NOVEMBER 2012



FACULTY OF APPLIED SCIENCES

OFFICE OF THE DEAN

8888 University Drive, Burnaby, BC
Canada V5A 1S6

TEL: 778.782.4724

FAX: 778.782.5802

www.fas.sfu.ca**MEMORANDUM**

ATTENTION	Senate Committee on Undergraduate Studies	DATE	July 21st, 2014
FROM	Ed Park, Associate Dean	PAGES	2
RE:	Curriculum Changes		

The following changes have been approved by the FAS Undergraduate Curriculum Committee and are appended here for approval by SCUS and recommendation to Senate.

1.) School of Engineering Science

I. New Course Proposal

a. ENSC 482

II. Course Pre-requisite Changes

- a. ENSC 220
- b. ENSC 252
- c. ENSC 254
- d. ENSC 280
- e. ENSC 305
- f. ENSC 325
- g. ENSC 327
- h. ENSC 328
- i. ENSC 350
- j. ENSC 351
- k. ENSC 387
- l. ENSC 424
- m. ENSC 427
- n. ENSC 440W
- o. ENSC 474
- p. ENSC 483
- q. ENSC 488
- r. ENSC 495

2.) School of Mechatronic Systems Engineering

I. Course Credit Changes - the credit units of the following courses are increased from 3 to 4 credit units

- a. MSE 221
- b. MSE 222
- c. MSE 223
- d. MSE 250
- e. MSE 320
- f. MSE 321

II. Course Credit/Pre-requisite Changes - the credit units of the following engineering elective courses are decreased from 4 to 3 credit units and students should have completed at least 80 credit units to register for these courses:

- a. MSE 420
- b. MSE 421
- c. MSE 422
- d. MSE 423
- e. MSE 424
- f. MSE 425
- g. MSE 426
- h. MSE 427
- i. MSE 450
- j. MSE 480
- k. MSE 481
- l. MSE 483

Thank you,



Edward Park
Associate Dean

(EP/mt)

COURSE SUBJECT/NUMBER ENSC 482

COURSE TITLE

LONG — for Calendar/schedule, no more than 100 characters including spaces and punctuation

Introduction to Decision Making in Engineering

AND

SHORT — for enrollment/transcript, no more than 30 characters including spaces and punctuation

Introduction to Decision Making in Engineering

CAMPUS where course will be taught: ☒ Burnaby ☐ Surrey ☐ Vancouver ☐ Great Northern Way ☐ Off campus

COURSE DESCRIPTION (FOR CALENDAR). 50-60 WORDS MAXIMUM. ATTACH A COURSE OUTLINE TO THIS PROPOSAL.

Covers topics from decision theory, pattern classification and optimization theory. In addition, it introduces students to the design and development of interactive decision making tools which can assist designers during the design process.

REPEAT FOR CREDIT



NO



YES

How many times? 1

Within a term?



YES



NO

LIBRARY RESOURCES

NOTE: Senate has approved (S.93-11) that no new course should be approved by Senate until funding has been committed for necessary library materials. Each new course proposal must be accompanied by a library report and, if appropriate, confirmation that funding arrangements have been addressed.

no additional resources required

Library report status

RATIONALE FOR INTRODUCTION OF THIS COURSE

Designers of a system always face challenges of decision making when encountering a number of alternative options/solutions in the face of many constraints and uncertain information. The course offers a general introduction and relevant background preparation for methodical decision making in engineering applications.

SCHEDULING AND ENROLLMENT INFORMATION

Indicate effective term and year course would first be offered and planned frequency of offering thereafter:

Spring of year 2016, once a year

Will this be a required or elective course in the curriculum? ☒ Required ☐ Elective

What is the probable enrollment when offered? Estimate:

50



CREDITS

Indicate number of credits (units): 4

Indicate number of hours for:	Lecture	Seminar	Tutorial	Lab	Other
	3		1	Open Lab	

FACULTY Which of your present CFL faculty have the expertise to offer this course?

Shahram Payandeh, Parvaneh Saeedi, Kamal Gupta

WQB DESIGNATION (attach approval from Curriculum Office)

PREREQUISITE

Does this course replicate the content of a previously-approved course to such an extent that students should not receive credit for both courses?

If so, this should be **noted in the prerequisite**.

MATH 232, MACM 316, (ENSC 280 or MSE 210 or PHYS 231), and a minimum of 80 units.

COREQUISITE

STUDENT LEARNING OUTCOMES

Upon satisfactory completion of the course students will be able to:

The students learn the theory and background needed for engineering decision making and optimization techniques that can be used in system design. The methods of this course are used in practice in various system design engineering fields .

FEES

Are there any proposed student fees associated with this course other than tuition fees? ☐ YES ☒ NO



RESOURCES

List any outstanding resource issues to be addressed prior to implementation: space, laboratory equipment, etc:

OTHER IMPLICATIONS

Articulation agreement reviewed? ☐ YES ☐ NO ☒ Not applicable

Exam required: ☒ YES ☐ NO

Criminal Record Check required: ☐ YES ☒ NO

APPROVALS: APPROVAL IS SIGNIFIED BY DATE AND APPROPRIATE SIGNATURE.

- 1 Departmental approval indicates that the Department or School has approved the content of the course, and has consulted with other Departments/Schools/Faculties regarding proposed course content and overlap issues.

Chair, Department/School

Date

Chair, Faculty Curriculum Committee

Date

- 2 Faculty approval indicates that all the necessary course content and overlap concerns have been resolved, and that the Faculty/School/Department commits to providing the required Library funds.

Dean or designate

Date

LIST which other Departments, Schools and Faculties have been consulted regarding the proposed course content, including overlap issues. Attach documentary evidence of responses.

Other Faculties' approval indicates that the Dean(s) or Designate of other Faculties AFFECTED by the proposed new course support(s) the approval of the new course:

Date _____

Date _____

- 3 SCUS approval indicates that the course has been approved for implementation subject, where appropriate, to financial issues being addressed.

COURSE APPROVED BY SCUS (Chair of SCUS):

Date _____

ENSC 482/8xx –Introduction to Decision Making in Engineering

Description:

Design and use of complex systems; includes the challenge of selecting a suitable design or an optimal action, subject to a number of resource and performance constraints. This course presents a number of methods that can assist in decision-making and classification of various choices en route to an optimal outcome. It covers engineering applications of decision theory, pattern classification and optimization theory. The course also introduces students to the design and development of interactive decision-making tools that can assist designers during the design process.

By the end of the course, students should be able to:

1. Categorize elementary types of decision-making based on various scenarios for a given decision problem.
2. Associate various types of uncertainties in a given design problem and use basic concepts from statistics to rate various decision actions or plans.
3. Be able to classify and cluster various types of data, design features or actions based on exact or statistical methods.
4. Formulate a design problem for optimization purposes and be able to carry-out the optimization task using a basic programming method.
5. Be able to cast a problem into an optimization problem and be able to search for an optimal solution using an appropriate optimization method.

Course outline

Week	Topic
	Decision Theory
1	Probabilistic concepts in design and decision-making
2	Decision matrix
3	Bayes decision Theory
	Pattern Classification
4	Decision functions and Pattern classification by distance
5	Pattern classification by likelihood
6-7	Clustering
	Principles of Optimization
8	Optimum design concepts and formulation
9-10	Engineering Applications of Linear Programming
	Discrete Optimization in Design and Decision Making
11	Network models and graph-based optimization
12	Fast approximate solutions using sub-optimal algorithms
13	Multiple-user design through Game Theory

Lectures:

3 hours of lectures per week and 1 hour of tutorial per week and

Lab:

Weekly open laboratory

Evaluation:

5 homework sets, one mid-term exam, one final exam, two group projects

Example Reference text-books:

- Instructor's lecture notes
- An Introduction to decision theory – by Martin, Peterson, Cambridge, 2009
- Introduction to optimum design – by Arora, J., Elsevier, 3rd edition, 2012
- Pattern recognition, by Theodoridis, S. , Elsevier, 4th edition, 2009
- Linear Algebra and its Applications, Strang, G., 3rd edition, HBJ Publishers



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☒ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 220 Course Subject/Number ENSC 220
Credits 3 Credits 4

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: PHYS 121 and 131, or PHYS 126 and PHYS 131, or PHYS 141, and MATH 232 and MATH 310. MATH 232 and/or MATH 310 may be taken concurrently. Students with credit for ENSC 125 or MSE 250 cannot take this course for further credit.

PREREQUISITE

TO: (PHYS 121 or PHYS 126 or PHYS 141) and (ENSC 120 or PHYS 131), and MATH 232 and MATH 310. MATH 232 and/or MATH 310 may be taken concurrently. Students with credit for MSE 250 cannot take this course for further credit.

LEARNING OUTCOMES

RATIONALE

- 1 - The increase in credit hours is proposed to reflect the work load of this course, which includes 3 hours of lecture, 1 hour of Tutorial, and 3 hours of scheduled laboratory per week. The new credit assignment will be consistent with other ENSC courses.
- 2 - ENSC 120 has been added as a prereq to reflect the change in our curriculum.
- 3- "ENSC 125" removed from the overlap sentence in the prerequisites. Rationale: This course was eliminated more than 10 years ago.

Effective term and year

Summer 2015

NOVEMBER 2012

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
 Course Subject/Number ENSC 252 Course Subject/Number ENSC 252

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____
 Fundamentals of Digital Logic & Design Fundamentals of Digital Logic & Design

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____**DESCRIPTION****FROM:** _____**DESCRIPTION****TO:** _____**PREREQUISITE**

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?

If so, this should be **noted in the prerequisite**.
FROM: CMPT 128 or CMPT 125 or CMPT 126. Students with credit for ENSC/CMPT 150 or ENSC 329/MSE 350 cannot take this course for further credit.
PREREQUISITE
TO: CMPT 128 or CMPT 125 or CMPT 126 or CMPT 135. Students with credit for ENSC/CMPT 150, ENSC 329, or MSE 352 cannot take this course for further credit. ENSC 252 is a required course for all Engineering Science Majors and Honours students (no course substitutions are permitted).
LEARNING OUTCOMES**RATIONALE**

We need to add pre-requisites that will allow students from Computing Science to meet the pre-requisites for ENSC 252.

We also needed to clearly state that while there is significant overlap in ENSC/CMPT 250, ENSC 329 and MSE 350 with this course, it is insufficient for our program's requirements. As such, our students must take ENSC 252 to graduate.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 254 Course Subject/Number ENSC 254

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 251, ensc 252. Students with credit for ENSC/CMPT 250 or ENSC 329/MSE 350 cannot take this course for further credit.

PREREQUISITE

TO: (ENSC 251 & ENSC 252) or (CMPT 150 & CMPT 225 & enrolled as a Computing Science Major). Students with credit for, or who are concurrently enrolled in ENSC/CMPT 250, ENSC 329, or MSE352 cannot take this course for further credit. ENSC 254 is a required course for all Engineering Science Majors and Honours students (no course substitutions are permitted).

LEARNING OUTCOMES

RATIONALE

We need to add pre-requisites that will allow students from Computing Science to meet the pre-requisites for ENSC 254.

We also needed to clearly state that while ^{THERE} ~~there~~ is significant overlap in ENSC/CMPT 250, ENSC 329 and MSE 350 with this course, it is insufficient for our program's requirements. As such, our students must take ENSC 254 to graduate.

Effective term and year

Summer 2015

NOVEMBER 2012

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☒ Credit ☐ Title ☒ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

 Indicate number of hours for: Lecture 3 Seminar _____ Tutorial 1 Lab 2

FROM ENSC 280 **TO** ENSC 280
 Course Subject/Number _____ Course Subject/Number _____
 Credits 3 Credits 4

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM:**TO:**

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM:**TO:****DESCRIPTION****FROM:**

An introduction to methods to collect and analyse engineering data. Topics include the Engineering data representation, Discrete and continuous probability density functions, Engineering measurements, Error analysis, Introduction to sensor interfaces, Introduction to physical sensors, Introduction to sensor signal conditioning, Noise, Test of hypotheses, Linear and nonlinear regression, and Design of experiments. Students with credit for MSE 210 or PHYS 231 cannot take this course for further credit. Students who have taken and passed ENSC 263 "Special Topics in ENSC: Engineering Measurement and Data Analysis" in Spring 2009 and Spring 2010 cannot take this course for further credit.

DESCRIPTION**TO:**

Methods to collect and analyse engineering data. Topics include: engineering data representation, discrete and continuous probability density functions, engineering measurements, error analysis, test of hypotheses, linear and nonlinear regression, and design of experiments. This course includes a significant laboratory component comprising: laboratory measurements and statistical analysis of electronic circuits, introduction to electronic device behaviour, instrument noise.

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?

If so, this should be **noted in the prerequisite**.**FROM:** PHYS 141 or equivalent. MATH 150 or MATH 151.**PREREQUISITE****TO:**

((PHYS 121 and ENSC 120) or PHYS 141) and (MATH 251 and 232). MATH 251 and/or MATH 232 may be taken concurrently with ENSC 280. Students with credit for STAT 270, MSE 210 or PHYS 231 cannot take this course for further credit. Engineering Science Major and Honours students are required to take ENSC 280 (no course substitutions will be accepted).

LEARNING OUTCOMES**RATIONALE**

Our students do not take PHYS 141 so we have added the appropriate pre-requisites (PHYS 121 & ENSC 120); we have left PHYS 141 to facilitate transfers and provide a path for MSE students.

We have raised the Math prereq to include MATH 251 and MATH 232 as the course will introduce multi-variable analysis.

We have altered the prereq to indicate that our students must take ENSC 280 to graduate and alternate courses will not be allowed to replace this requirement.

We are increasing the credit hour content as we are increasing the lab content for the course. We have also updated the lab description indicate the electronics lab content. The students electronics text book will be used to provide supplementary material on the electronic circuits and components analyzed in the lab.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 325 Course Subject/Number _____
Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 225.

PREREQUISITE

TO: ENSC 225 or ENSC 226 or MSE 251.

LEARNING OUTCOMES

RATIONALE

MSE equivalents are being added to the list of acceptable prerequisites.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 327 Course Subject/Number ENSC 327

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 380 and STAT 270

PREREQUISITE

ENSC 380 and ENSC 280. Students who completed STAT 270
TO: prior to Spring 2015 may use STAT 270 instead of ENSC 280.

LEARNING OUTCOMES

RATIONALE

STAT 270 is being replaced by ENSC 280 in our curriculum so it needs to be added as a pre-requisite.

Effective term and year
Summer 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 328 Course Subject/Number ENSC 328

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 380 and STAT 270. STAT 270 may be taken concurrently.

PREREQUISITE

TO: ENSC 380 and ENSC 280. ENSC 280 may be taken concurrently with ENSC 328. Students who completed STAT 270 prior to Spring 2015 may use STAT 270 instead of ENSC 280.

LEARNING OUTCOMES

RATIONALE

STAT 270 is being replaced with ENSC 280 in our curriculum so the pre-requisite needs to be revised accordingly.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 350 Course Subject/Number ENSC 350

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: Prerequisite: ENSC 215, and either ENSC 250 or CMPT 250. **TO:** (ENSC 215 and either ENSC 250 or CMPT 250) or (ENSC 252 and ENSC 254).

LEARNING OUTCOMES

RATIONALE

ENSC 215 and ENSC 250 are being removed from our curriculum so we need to add the new courses covering the pre-requisite material for ENSC 350 to the pre-requisites. ENSC 252 must be explicitly stated as a pre-requisite because CMPT students may take ENSC 254 without taking ENSC 252.

Effective term and year
Summer 2015



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 351 Course Subject/Number ENSC 351

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?

If so, this should be **noted in the prerequisite**.

FROM: (CMPT 128 and ENSC 215 and ENSC 250) or ENSC 254,
and a minimum of 60 credit units.

PREREQUISITE

TO: (CMPT 128 and ENSC 215 and ENSC 250) or ENSC 254 or (CMPT 225 and CMPT 250) and a minimum of 60 credit hours/units. Students with credit for or who are concurrently enrolled in ENSC 451 or MSE 450 cannot take this course for further credit. ENSC 351 is a required course for all Engineering Science Majors and Honours students (no course substitutions are permitted).

LEARNING OUTCOMES

RATIONALE

We need to add pre-requisites that will allow students from Computing Science to meet the pre-requisites for ENSC 351.

We also need prevent our students from getting credit for courses with significant overlap (ENSC 451, MSE 450). However, this overlap is insufficient to meet the learning outcomes required by our program; as such, all of our students are required to take ENSC 351 to graduate.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 387 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 380.

PREREQUISITE

TO: ENSC 380 or MSE 280. Students with credit for MSE 310 cannot take this course for further credit.

LEARNING OUTCOMES

RATIONALE

MSE equivalent (MSE 280) is being added to the list of acceptable prerequisites. Exclusion of equivalent MSE 310 added.

Effective term and year
Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 424 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 380 and a minimum of 80 units. **TO:** ENSC 380 or MSE 280 and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

MSE equivalents are being added to the list of acceptable prerequisites.



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 427 Course Subject/Number ENSC 427

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 327 and a minimum of 80 units.

PREREQUISITE

TO: ENSC 327 or, for School of Computing Science Majors, CMPT 371. A minimum of 80 units required. Engineering students with credit for CMPT 371 may not take ENSC 427 for further credit.

LEARNING OUTCOMES

RATIONALE

All ENSC students take ENSC 327; however, CMPT 371 has been added as an alternate prerequisite for CMPT Majors. There is sufficient overlap in course content that when students take ENSC 327 and CMPT 371 for credit they should not be allowed to take ENSC 427 for additional credit.

Effective term and year
Summer 2015

EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☒ Description ☐ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____

Course Subject/Number ENSC 440W Course Subject/Number ENSC 440W

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM:

Capstone Engineering Science

TO:

Capstone Engineering Science

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM:**TO:****DESCRIPTION****FROM:**

This capstone design course is based around a group project that consists of researching, designing, building, and testing the hardware implementation of a working system. The course also includes material on how to design for safety, engineering standards, and human factors. Students with credit for ENSC 340, 370, or 440 may not take this course for further credit.

DESCRIPTION**TO:**

This capstone design course is based around a group project that consists of researching, designing, building, and testing the hardware implementation of a working system. The course also includes material on how to design for safety, engineering standards, and human factors. Students with credit for ENSC 440, ENSC 442, or MSE 411W may not take this course for further credit.

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

PREREQUISITE**TO:****FROM:****LEARNING OUTCOMES****RATIONALE**

The sentence, "Students with credit for ENSC 340, 370, or 440 may not take this course for further credit." has been updated to reflect that ENSC 340 has been removed from the curriculum and ENSC 370 has been removed and the re-added as a completely different course (Biomedical Engineering Directions). Finally, the MSE capstone courses (ENSC 442 and MSE 411W) were added to be excluded for further credit.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☒ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM **TO**
Course Subject/Number ENSC 474 Course Subject/Number same
Credits 4 Credits same

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: **TO:**
Digital/Medical Image Processing Same

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: **TO:**

DESCRIPTION

FROM:

Develops signal processing techniques of wide applicability, presented in the context of processing and analysis of digital images, in particular 2D and 3D biomedical images. Covers acquisition, formation and representation of digital images, filtering, enhancement and restoration in both spatial and frequency domains, image segmentation, image registration, and discrete image transforms. Students with credit for ENSC 460/895 cannot take this course for further credit.

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses? If so, this should be **noted in the prerequisite**.

FROM: CMPT 128, 225 (or permission of the instructor), ENSC 380, and a minimum of 80 units.

LEARNING OUTCOMES

DESCRIPTION

TO:

Develops signal processing techniques of wide applicability, presented in the context of processing and analysis of digital images, in particular 2D and 3D biomedical images. Covers acquisition, formation and representation of digital images, filtering, enhancement and restoration in both spatial and frequency domains, image segmentation, image registration, and discrete image transforms.

PREREQUISITE

TO: ((ENSC 180 and ENSC 251) or CMPT 225), and a minimum of 80 units.

RATIONALE

The course was originally offered as ENSC 460 Special Topics (last offering in 2009), but has since been a calendar course ENSC 474; as such the special topics exclusion has been removed.

ENSC curriculum changes have introduced an alternate appropriate elective stream; we have also provided an alternate path for Computing students to be able to take this course.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 483 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 383 or MSE 383 and a minimum of 80 units. **TO:** ENSC 383 or MSE 381, and a minimum of 80 units. Students with credit for MSE 483 may not take this course for further credit.

LEARNING OUTCOMES

RATIONALE

MSE equivalent is being corrected on the list of acceptable prerequisites.

Added exclusion of equivalents.



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 488 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: ENSC 383 and a minimum of 80 units. **TO:** (ENSC 230 or ENSC 386) and (ENSC 383 or MSE 381), and a minimum of 80 units.

LEARNING OUTCOMES

RATIONALE

MSE equivalent (MSE 381) is being added to the list of acceptable prerequisites. Additionally, ENSC 230 (Intro to Mechanical design) is being added to this intro to robotics course prerequisite list due to its relevant material.

Effective term and year
Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☒ Prerequisite ☐ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 495 Course Subject/Number _____

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____ **TO:** _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: Completion of 80 units including ENSC 225 or 226, and permission of the instructor.

PREREQUISITE

TO: ENSC 225 or 226 or MSE 251 or PHYS 365, and permission of the instructor and a minimum of 80 units. Enrolment in this course is by application only.

LEARNING OUTCOMES

RATIONALE

MSE equivalents are being added to the list of acceptable prerequisites.

Due to lab space limitations and demand, this course is always oversubscribed; enrolment in this course is always by application.

Effective term and year

Summer 2015

NOVEMBER 2012



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

☐ Course number ☐ Credit ☐ Title ☐ Description ☐ Prerequisite ☒ Course deletion ☐ Learning Outcomes

Indicate number of hours for: Lecture _____ Seminar _____ Tutorial _____ Lab _____

FROM _____ **TO** _____
Course Subject/Number ENSC 305 Course Subject/Number ENSC 305

Credits _____ Credits _____

TITLE

(1) LONG title for calendar and schedule, no more than 100 characters including spaces and punctuation.

FROM: _____ **TO:** _____

Project Documentation and Team Dynamics

(2) SHORT title for enrollment and transcript, no more than 30 characters including spaces and punctuation.

FROM: _____ **TO:** _____

DESCRIPTION

FROM: _____

DESCRIPTION

TO: _____

PREREQUISITE

Does this course replicate the content of a previously approved course to such an extent that students should not receive credit for both courses?
If so, this should be **noted in the prerequisite**.

FROM: _____ **TO:** _____

LEARNING OUTCOMES

RATIONALE

Course no longer offered; hasn't been since W requirement at SFU.

Effective term and year

Summer 2015

NOVEMBER 2012

To: Dr. Edward Park – Associate Dean, Faculty of Applied Sciences

From: Ahmad Rad – UCC Chair, School of Mechatronic Systems Engineering

Date: July 15, 2014

Re: Credit unit changes for selective MSE courses

The Faculty committee of the School of Mechatronic Systems Engineering has approved the following changes to the program.

- i) The credit units of the following courses are increased from 3 to 4 credit units
MSE 221: Statics and Strength of Materials
MSE 222: Kinematics & Dynamics of rigid bodies and Mechanisms
MSE 223: Fluid Mechanics
MSE 250: Electric Circuits
MSE 320: Machine Design
MSE 321: Engineering Thermodynamics and Heat transfer

- ii) The credit units for the following engineering elective courses are decreased from 4 to 3 credit units. In addition, the pre-requisite section for each of these courses should be updated to include "and a minimum of 80 credits".
MSE 420: Introduction to Biomechanical Engineering
MSE 421: Advanced Vibration
MSE 422: Fuel Cell Systems
MSE 423 - Energy Conversion
MSE 424 - Microfluidics
MSE 425: Nano Manufacturing for Nano-scale Devices
MSE 426: Introduction to Engineering Design Optimization
MSE 427: Finite Element Analysis
MSE 450: Real-Time and Embedded Control Systems
MSE 480: Manufacturing Systems
MSE 481: Industrial Control Systems
MSE 483: Modern Control Systems

Rationale: Students are required to complete 146 credit units to fulfill graduation requirements of MSE program. The program allows students to take six engineering elective courses each carrying 4 credit units.

In order to address full compliance with the expectations of Canadian Engineering Accreditation Board (CEAB) with respect to categories of engineering science and engineering design, the credit number of six 200- and 300-level courses are increased to 4 from 3 and the credit units of all engineering electives are reduced from 4 credit units to 3 credit units. Therefore, the net number of credit units for the program is not changed.

Ahmad Rad

UUC Chair - MSE