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MEMORANDUM

ATTENTION	Senate	DATE	March 5, 2010
FROM	Bill Krane, Chair	PAGES	1/1
RE:	Senate Committee on Undergraduate Studies Faculty of Applied Sciences		

For information:

Acting under delegated authority at its meeting of March 4, 2010, SCUS approved the following curriculum revisions:

1. School of Computing Science (SCUS 10-13b)

- (i) Changes to the First-year Requirements in the Software Systems Major Program
- (ii) Prerequisite changes for CMPT 100, 102, 120, 125, 126, 128, 150, 212, 218, 225, 250, 301, 305, 310, 318, 320, 340, 354, 361, 363, 365, 379, 383, 417, 418, and 499.

2. School of Engineering Science (SCUS 10-20)

- (i) New Course proposal: ENSC 280-3, Engineering Measurement and Data Analysis
- (ii) Changes to the requirements for the Mechatronics Systems Engineering program.

Senators wishing to consult a more detailed report of curriculum revisions may do so on the Web at http://www.sfu.ca/senate/Senate_agenda.html following the posting of the agenda. If you are unable to access the information, please call 778-782-3168 or email bgrant@sfu.ca.

Software Systems Calendar Change #2

The following changes should be made to page 79 of the Calendar, specifically to the section entitled "Software Systems Major Program". The original text is included below, with the additions underlined in blue:

Software Systems Major Program

This program provides skills, knowledge and thought processes necessary for professional software production, while also providing a broad background of various computing systems that graduates encounter in their careers. For course planning information, visit <http://www.cs.sfu.ca/undergrad/Advising>

First-year Requirements

The first year of Software Systems is the Systems One program, a joint program with the Mechatronics Systems Engineering program. The courses required for Systems One are included in the following lists of requirements.

Systems Requirements

Students complete all of

CMPT 150-3 Introduction to Computer Design
CMPT 250-3 Introduction to Computer Architecture
CMPT 300-3 Operating Systems I

ENSC 182-3 Mechatronics Design I

and two of

CMPT 170-3 Introduction to Web Application Development
CMPT 371-3 Data Communications and Networking
CMPT 471-3 Networking II
CMPT 354-3 Database Systems I
CMPT 454-3 Database Systems II

CMPT 401-3 Operating Systems II
CMPT 432-3 Real-time Systems
CMPT 433-3 Embedded Systems
CMPT 470-3 Web-based Information Systems
18 units

Fundamentals Requirements

Students complete all of

CMPT 105W-3/ENSC 105W-3 Process, Form, and Convention in professional Genres

CMPT 106-3/ENSC 106-3 Applied Science, Technology and Society

CMPT 307-3 Data Structures and Algorithms

MACM 101-3 Discrete Mathematics I

MACM 201-3 Discrete Mathematics II

MATH 151-3 Calculus I

MATH 232-3 Elementary Linear Algebra

CMPT 322W-3 Professional Responsibility and Ethics

and one of

STAT 101-3 Introduction to Statistics

STAT 270-3 Introduction to Probability and Statistics

24 units

The remainder of this section of the Calendar should remain unchanged.



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM		TO
Course Number	CMPT 100	Course Number _____
Credits (Units)	_____	Credits (Units) _____

TITLE

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

Software packages and programming

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

BC Mathematics 12 or MATH 100 or MATH 110. Students with credit for CMPT 101, 102, 103, 104, 120, 126 or 128 may not take CMPT 100 for further credit.

PREREQUISITE

BC Mathematics 12 or MATH 100 or MATH 110. Students with credit for CMPT 102, 120, 126 or 128 may not take CMPT 100 for further credit.

RATIONALE

CMPT 101, 103, and 104 have not been offered for more than five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 120 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Introduction to computer science and programming I

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

DESCRIPTION

BC Math 12 or equivalent is recommended. Students with credit for CMPT 101, 102, 103, 104, 125, 126, 128 or any course numbered CMPT 200 or higher may not take this course for further credit. Quantitative/Breadth-Science

DESCRIPTION

PREREQUISITE

(See above---didn't fit in this box.)

BC Math 12 or equivalent recommended. Students with credit for CMPT 102,125, 126, 128 or CMPT 200 or higher may not take for further credit. Quantitative/Breadth-Science.

RATIONALE

CMPT 101, 103, and 104 have not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM		TO
Course Number	CMPT 126	Course Number _____
Credits (Units)	_____	Credits (Units) _____

TITLE

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

Introduction to computing science and programming

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

DESCRIPTION

Students with credit for CMPT 101, 104, 125, 128 or any course numbered CMPT 200 or higher may not take this course for further credit. Quantitative/Breadth-Science.

DESCRIPTION

PREREQUISITE

(See above-didn't fit)

PREREQUISITE

Students with credit for CMPT 125, 128 or CMPT 200 or higher may not take for further credit. Quantitative/Breadth-Science.

RATIONALE

CMPT 101 and 104 have not been offered for more than five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

- Course number
- Credit
- Title
- Description
- Prerequisite
- Course deletion

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

FROM **TO**

Course Number CMPT 128 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Introduction to computing science and programming for engineers

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

DESCRIPTION

BC Math 12 (or equivalent). Students with credit for CMPT 101, 104, 125, 126 or any course numbered CMPT 200 or higher may not take this course for further credit. Quantitative/Breadth-Science.

DESCRIPTION

PREREQUISITE

(See above---didn't fit.)

BC Math 12 (or equivalent). Students with credit for CMPT 125, 126 or CMPT 200 or higher may not take for further credit. Quantitative/Breadth-Science.

RATIONALE

CMPT 101 and 104 have not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 150 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Introduction to computer design.

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

DESCRIPTION

Students who have taken ENSC 150 or CMPT 290 cannot take this course for further credit. Strongly recommended: MACM 101 and CMPT 120, or MACM 101 and substantial programming background. Quantitative.

DESCRIPTION

PREREQUISITE

Students who have taken ENSC 150 cannot take for further credit. Strongly recommended: MACM 101 and either CMPT 120 or equivalent programming. Quantitative.

PREREQUISITE

(See above---didn't fit.)

RATIONALE

CMPT 290 has not been offered for over five years.

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**.

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 212 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Object-oriented applications design in C++

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 101, 104, 125, 126 or 128. Recommended: CMPT 201 or 225.

PREREQUISITE

CMPT 125, 126 or 128. Recommended: CMPT 225.

RATIONALE

CMPT 101, 104, and 201 have not been offered for over five years.

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**.

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 218 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Special topics in computing science

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 205

PREREQUISITE

RATIONALE

CMPT 201 and 205 have not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 225 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Data structures and programming

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

DESCRIPTION

MACM 101 and one of CMPT 101, 104, 125, 126 or 128; or
CMPT 128 and approval as a Biomedical Engineering Major.
Students with credit for CMPT 201 may not take this course for
further credit. Quantitative.

DESCRIPTION

PREREQUISITE

(See above---didn't fit.)

MACM 101 and one of CMPT 125, 126 or 128; or CMPT 128
and approval as a Biomedical Engineering Major.
Quantitative.

RATIONALE

CMPT 101, 104, and 201 have not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

- Course number
- Credit
- Title
- Description
- Prerequisite
- Course deletion

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

FROM **TO**

Course Number CMPT 250 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Introduction to computer architecture

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

DESCRIPTION

CMPT/ENSC150, or CMPT 290 or 105 with permission of instructor. This course is identical to ENSC 250 and students cannot take both courses for credit. Students who have taken CMPT 390 may not take CMPT 250 for further credit. Quantitative.

PREREQUISITE

(See above. Didn't fit.)

DESCRIPTION

PREREQUISITE

CMPT/ENSC150. This course is identical to ENSC 250 and students cannot take both courses for credit. Quantitative.

RATIONALE

CMPT 105, 290, and 390 have not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 301 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Information systems management

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225

PREREQUISITE

CMPT 225

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 305 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Computer simulation and modeling

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225, MACM 101, STAT 270.

PREREQUISITE

CMPT 225, MACM 101, STAT 270.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 318 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Special topics in computing science

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225.

PREREQUISITE

CMPT 225.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM

Course Number CMPT 320

Credits (Units) _____

TO

Course Number _____

Credits (Units) _____

TITLE

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

Social implications—computerized society

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

a course in computing science and 45 units. Students with credit for CMPT 260 may not take CMPT 320 for further credit. Breadth-Science.

PREREQUISITE

A CMPT course and 45 units. Breadth-Science.

RATIONALE

CMPT 260 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

- Course number
- Credit
- Title
- Description
- Prerequisite
- Course deletion

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

FROM **TO**

Course Number CMPT 340 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Biomedical computing

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

Completion of 60 units including CMPT 101, 125, 126 or 128 (or 102 or 104 with a grade of B or higher).

PREREQUISITE

Completion of 60 units including CMPT 125, 126 or 128 (or 102 with a grade of B or higher).

RATIONALE

CMPT 101 and 104 have not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 354 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Database systems I

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225, MACM 101.

PREREQUISITE

CMPT 225, MACM 101.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 363 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

User interface design

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225.

PREREQUISITE

CMPT 225.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 365 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Multimedia systems

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225.

PREREQUISITE

CMPT 225.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 383 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Comparative programming languages

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225, MACM 101.

PREREQUISITE

CMPT 225, MACM 101.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 418 Course Number _____

Credits (Units) _____ Credits (Units) _____

TITLE

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

Computational cognitive architecture

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT 201 or 225. Recommended: CMPT 310.

PREREQUISITE

CMPT 225. Recommended: CMPT 310.

RATIONALE

CMPT 201 has not been offered for over five years.

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.**

Effective term and year Fall 2010



EXISTING COURSE, CHANGES RECOMMENDED

Please check appropriate revision(s):

Course number Credit Title Description Prerequisite Course deletion

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

FROM **TO**
Course Number CMPT 499 Course Number _____
Credits (Units) _____ Credits (Units) _____

TITLE

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

Special topics in computer hardware

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

DESCRIPTION

DESCRIPTION

PREREQUISITE

CMPT/ENSC 250 or CMPT 390.

PREREQUISITE

CMPT/ENSC 250.

RATIONALE

CMPT 390 has not been offered for over five years.

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.**

Effective term and year Fall 2010



MEMO

Office of the Dean

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ATTENTION Bill Krane, Chair SCUS**FROM** Fred Popowich, Associate Dean,
Faculty of Applied Sciences**RE** Faculty of Applied Sciences
Undergraduate Curriculum Changes**DATE** February 22, 2010

In addition to SCUS 10-13(a)(i) Systems One Full Program Proposal and SCUS 10-13(b)(ii) Pre-requisite changes which were tabled at the last SCUS meeting, 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. ~~Revised documentation for SCUS 10-13(b)(i) changes to the first-year requirements in the Software Systems major program. While incorporating Systems One, it was determined that STAT-101 should not be deleted as proposed at an earlier SCUS meeting, as it may be needed as a pre-requisite for some students.~~
2. New Course Proposal for ENSC 280-3
3. Mechatronics Systems Engineering (MSE) calendar changes related to Systems One, ENSC 280 and other previously approved changes.



COURSE NUMBER ENSC 280

COURSE TITLE

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

AND

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

CREDITS

Indicate number of credits for: Lecture 3 Seminar Tutorial 1 Lab

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

~~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.

PREREQUISITE

PHYS 141 or equivalent. MATH 150 or MATH 151. Students with credit for 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.

COREQUISITE

None

SPECIAL INSTRUCTIONS

That is, 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.

COURSE(S) TO BE DELETED IF THIS COURSE IS APPROVED

NOTE: APPROPRIATE DOCUMENT FOR DELETION MUST BE SUBMITTED TO SCUS

RATIONALE FOR INTRODUCTION OF THIS COURSE

This course will replace PHYS 231 in the MSE curriculum. The course is developed to satisfy the CEAB requirements for teaching statistics and probability to our students while presenting the mathematical concepts in applied engineering format.



SCHEDULING AND ENROLLMENT INFORMATION

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

This course will first be offered in Spring 2011, and annually thereafter.

(NOTE: There is a two-term wait for implementation of any new course.)

Indicate if there is a waiver required: YES NO Will this be a required or elective course in the curriculum? Required Elective

What is the probable enrollment when offered? Estimate 70

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

Dr Behraad Bahreyni
Professor Ahmad Rad

Are there any proposed student fees associated with this course other than tuition fees? YES NO
(If yes, attach mandatory supplementary fee approval form.)

RESOURCE IMPLICATIONS

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.

Campus where course will be taught Surrey

Library report status Relevant books and supplies were ordered last year and are available in Surrey library.

Provide details on how existing instructional resources will be redistributed to accommodate this new course. For example, will another course be eliminated or will the frequency of offering of other courses be reduced; are there changes in pedagogical style or class sizes that allow for this additional course offering?

This course is part of the MSE curriculum.

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

The required laboratory and library resources have been provided.

Articulation agreement reviewed? YES NO Not applicable

OTHER IMPLICATIONS



APPROVALS

- 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.

Kand Kart Gupta Jan 26, 2010
Chair, Department/School Date

[Signature] Jan 26, 2010
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.

[Signature] Jan 26, 2010
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.

SCIENCE

Other Faculties approval indicated 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 _____

APPROVAL IS SIGNIFIED BY DATE AND APPROPRIATE SIGNATURE.

Modifications to the syllabus for

ENSC280: Engineering Measurement and Data Analysis

Prepared by Dr B. Bahreyni

Course outline as taught in Spring 2009	Proposed course outline for Spring 2011
<p>(1) Data representation Dot plots, Stem-and-Leaf diagrams, Histograms, Box plots, Time series plots, Scatter plots</p> <p>(2) Introduction to probability Population and sample, Random variables, Mean and variance, Functions of random variables, Independence</p> <p>(3) Probability distribution functions Discrete distributions: Binomial, Poisson Continuous distributions: Normal, Lognormal, Exponential, Weibull, Gamma Normal approximations to binomial and Poisson distributions</p> <p>(4) Error analysis Reporting and using uncertainties, Error propagation, Random and systematic errors</p> <p>(5) Engineering measurement Sensitivity, Accuracy, Precision, Resolution, Quantization, Noise</p> <p>(6) Point estimation Unbiasedness, Minimum Variance Unbiased Estimators</p> <p>(7) Hypothesis testing z-test, t-test, χ^2 test, F-test, Analysis of variance, Testing for the goodness of a fit</p> <p>(8) Empirical models Simple linear regression, Multiple regression, Least-square fitting to polynomial models</p> <p>(9) Design of experiments Factorial experiments</p> <p>(10) Statistical process control \bar{X} and R charts, Process stability and control.</p>	<p>(1) Data representation Dot plots, Stem-and-Leaf diagrams, Histograms, Box plots, Time series plots, Scatter plots</p> <p>(2) Introduction to probability Population and sample, Random variables, Mean and variance, Functions of random variables, Independence</p> <p>(3) Probability distribution functions Discrete and continuous distributions: Binomial, Poisson Continuous distributions: Normal, Lognormal, Exponential, Weibull, Gamma Normal approximations to binomial and Poisson distributions</p> <p>(4) Error analysis Reporting and using uncertainties, Error propagation, Random and systematic errors</p> <p>(5) Engineering measurement Sensitivity, Accuracy, Precision, Resolution, Quantization, Noise</p> <p>(6) Sensor interfaces Resistive, Capacitive, Inductive, Piezoelectric, and Solid-state sensors and their interfaces</p> <p>(7) Introduction to sensors Strain gauges, temperature sensors, pressure sensors, inertial sensors.</p> <p>(8) Sensor signal conditioning Interface electronics for the different sensors, analog signal processing techniques, noise.</p> <p>(9) Point estimation Unbiasedness, Minimum-variance unbiased estimators</p> <p>(10) Hypothesis testing z-test, t-test, χ^2 test, F-test, Testing for goodness of a fit</p> <p>(11) Empirical models Simple linear regression, Multiple regression, Least-square fitting to polynomial models</p> <p>(12) Design of experiments Factorial experiments</p>
<p>Textbook: <i>Engineering Statistics</i>, By Montgomery, Runger, Hubele. John Wiley & Sons, Inc., 2008.</p>	<p>Textbook: <i>Statistics for Engineers and Scientists</i>, By W. Navidi, McGraw-Hill, 2007.</p>

Explanation of changes:

Based on our experience with teaching ENSC 263 in spring 2009, we decided to modify the course syllabus so that it better suits the needs of our students. Additionally, professors Rad and Park and I have discussed the status and expectations for our course on Engineering Data Analysis (currently offered as a Special Topics course). Based on the requirements of our program and the CEAB, we came to conclusion that some it was necessary to introduce more engineering aspects into the course while still covering the needed statistical topics. The proposed changes will make the course fit better within our curriculum. In 2009, I dedicated four lectures to engineering applications of statistics and covered topics such as Error analysis (Reporting and using uncertainties, Error propagation, Random and systematic errors, and Calibration) and Engineering measurements (Sensitivity, Accuracy, Precision, Resolution, Quantization, and Methodological elimination of outliers).

ENSC 280 will be the first in a series of courses on sensors and actuators and is prepared such that it will provide the students with the necessary mathematical background to process the data from such transducers. We believed that in order for our students to obtain the engineering perspective, we needed to introduce some introductory information on sensors. This lets the students collect realistic data in their experiments in the lab which they will then analyse using the statistical tools that they learn about in the course. The student will then learn more about the different types of sensors and actuators in courses like ENSC387 and will learn about their fabrication in ENSC331.

The following topics are going to be added to the original syllabus:

- 1- *Sensor interfaces*: Resistive, Capacitive, Inductive, Piezoelectric, and Solid-state sensors and their interfaces;
- 2- *Introduction to sensors*: Strain gauges, temperature sensors, pressure sensors, inertial sensors;
- 3- *Sensor signal conditioning*: Interface electronics for the different sensors, analog signal processing techniques, noise.

To allow for the addition of the above discussions into the lectures, the discussions of “Statistical process control” and “Analysis of variance” will be dropped from the syllabus.

The laboratories that were developed for the course required the students to collect some data by performing a simple engineering experiment and analyse the data using the theory they learnt in lectures. This practical use of statistical theories was very highly appreciated by the students. Therefore, we are also going to increase the number of laboratories to four (from three) and let the students become familiar with two more types of sensors, while practicing other aspects of their statistical knowledge.

Engineering Measurement and Data Analysis (ENSC 280)

Prepared by B. Bahreyni, Assistant professor
Mechatronic Systems Engineering, School of Engineering Science

Proposed Course Outline

(1) Data representation

Dot plots, Stem-and-Leaf diagrams, Histograms, Box plots, Time series plots, Scatter plots

(2) Introduction to probability

Population and sample, Random variables, Mean and variance, Functions of random variables, Independence

(3) Probability distribution functions

Discrete and continuous distributions: Binomial, Poisson
Continuous distributions: Normal, Lognormal, Exponential, Weibull, Gamma
Normal approximations to binomial and Poisson distributions

(4) Error analysis

Reporting and using uncertainties, Error propagation, Random and systematic errors

(5) Engineering measurement

Sensitivity, Accuracy, Precision, Resolution, Quantization, Noise

(6) Sensor interfaces

Resistive, Capacitive, Inductive, Piezoelectric, and Solid-state sensors and their interfaces

(7) Introduction to sensors

Strain gauges, temperature sensors, pressure sensors, inertial sensors.

(8) Sensor signal conditioning

Interface electronics for the different sensors, analog signal processing techniques, noise.

(9) Point estimation

Unbiasedness, Minimum-variance unbiased estimators

(10) Hypothesis testing

z-test, t-test, χ^2 test, F-test, Testing for the goodness of a fit

(11) Empirical models

Simple linear regression, Multiple regression, Least-square fitting to polynomial models

(12) Design of experiments

Factorial experiments

Contact hours:

3 lecture hours per week, 1 tutorial hour per week

Recommended textbook

Statistics for Engineers and Scientists, 2nd Ed

By *William Navidi*, McGraw-Hill, 2007

Evaluation

Evaluation Component/Percentage of overall mark (out of 100)

5 Assignments	5%
4 Laboratories	10%
4 Quizzes	20%
1 Midterm exam	15%
Final exam	50%

The midterm and final are closed book examinations of the course material. Students are permitted to use a crib sheet consisting of one 8 1/2× 11 paper (double-sided).

Calendar change for Mechatronic Systems Engineering (MSE) Program

1. Proposed 1st year Systems One replacing Tech One for Mechatronic Systems Engineering (MSE) Program¹

From:	To:
<p><i>Term One (Fall)</i></p> <p>CMPT 128-3 Introduction to Computing Science and Programming for Engineers MATH 151-3 Calculus I PHYS 140-4 Studio Physics – Mechanics and Modern Physics TECH 106-3 Spatial Thinking and Communicating TECH 114-3 Technology in Everyday Contexts</p> <p>and one of</p> <p>CHEM 120-3 General Chemistry I CHEM 121-4 General Chemistry and Laboratory I 19 or 20 units</p>	<p><i>Term One (Fall)</i></p> <p>CMPT 128-3 Introduction to Computing Science and Programming for Engineers MATH 151-3 Calculus I PHYS 140-4 Studio Physics – Mechanics and Modern Physics <u>ENSC 104-3 Engineering Graphics and Design</u> <u>Cmpl I-3 first complementary elective</u></p> <p>and one of</p> <p>CHEM 120-3 General Chemistry I CHEM 121-4 General Chemistry and Laboratory I 19 or 20 units</p>
<p><i>Term Two (Spring)</i></p> <p>Cmpl I-3 first complementary elective ENSC 182-3 Mechatronics Design I MATH 152-3 Calculus II MATH 232-3 Elementary Linear Algebra PHYS 141-4 Studio Physics – Optics, Electricity and Magnetism* TECH 101-3W Communication, Teamwork and Collaborative Process 19 units</p>	<p><i>Term Two (Spring)</i></p> <p><u>ENSC 106-3 Applied Science, Technology and Society*</u> <u>ENSC 105W-3 Process, Form, and Convention in Professional Genres</u> ENSC 182-3 Mechatronics Design I MATH 152-3 Calculus II MATH 232-3 Elementary Linear Algebra PHYS 141-4 Studio Physics – Optics, Electricity and Magnetism 19 units</p>

¹ SFU Calendar 2009/2010 Page 86 Faculty of Applied Sciences

2. Schedule changes incorporating ENSC 280 for MSE Program

From:	To:
<p><i>Term Four (Spring)</i></p> <p>Students complete all of</p> <p>ENSC 226-4 Electronic Circuits* ENSC 282-3 Kinematics and Dynamics of Rigid Bodies and Mechanisms* ENSC 283-3 Introduction to Fluid Mechanics* ENSC 380-3 Linear Systems* MACM 316-3 Numerical Analysis I PHYS 231-3 Physics Laboratory II*</p> <p>19 units</p>	<p><i>Term Four (Spring)</i></p> <p>Students complete all of</p> <p>ENSC 226-4 Electronic Circuits* ENSC 282-3 Kinematics and Dynamics of Rigid Bodies and Mechanisms* ENSC 283-3 Introduction to Fluid Mechanics* ENSC 380-3 Linear Systems* MACM 316-3 Numerical Analysis I <u>ENSC 280-3 Engineering Measurement and Data Analysis*</u></p> <p>19 units</p>
<p><i>Term Five (Fall)</i></p> <p>ENSC 311-3 The Business of Engineering I: Fundamentals ENSC 329-4 Introduction to Digital Logic ENSC 381-3 Systems Modelling and Simulation ENSC 382-3 Machine Design PHYS 344-3 Thermal Physics² ENSC 387-4 Introduction to Electromechanical Sensors and Actuators</p> <p>20 units</p>	<p><i>Term Five (Fall)</i></p> <p><u>ENSC I-4 First Engineering elective</u> ENSC 329-4 Introduction to Digital Logic ENSC 381-3 Systems Modelling and Simulation ENSC 382-3 Machine Design <u>ENSC 388-3 Engineering Thermodynamics and Heat Transfer³</u> ENSC 387-4 Introduction to Electromechanical Sensors and Actuators</p> <p>21 units</p>
<p><i>Term Six (Summer)</i></p> <p>ENSC 312-3 The Business of Engineering II: Applications and Commercialization ENSC 331-3 Introduction to MEMS ENSC 332-4 Microprocessors and Interfacing ENSC 383-4 Feedback Control Systems ENSC 384-4 Mechatronics Design II</p> <p>18 units</p>	<p><i>Term Six (Summer)</i></p> <p><u>ENSC 311-3 The Business of Engineering I: Fundamentals</u> ENSC 331-3 Introduction to MEMS ENSC 332-4 Microprocessors and Interfacing ENSC 383-4 Feedback Control Systems ENSC 384-4 Mechatronics Design II</p> <p>18 units</p>
<p><i>Term Seven (Spring)</i></p> <p>ENSC I-4 First Engineering elective ENSC II-4 second Engineering Science elective ENSC 305-1 Project Documentation and Team Dynamics ENSC 451-4 Real Time and Embedded Systems ENSC 441-3 Capstone Design Technical Project I</p> <p>16 units</p>	<p><i>Term Seven (Spring)</i></p> <p><u>ENSC 312-3 The Business of Engineering II: Applications and Commercialization</u> ENSC II-4 second Engineering Science elective ENSC 305-1 Project Documentation and Team Dynamics ENSC 451-4 Real Time and Embedded Systems ENSC 441-3 Capstone Design Technical Project I</p> <p>15 units</p>

² Already approved in 2008-2009 but not reflected in the Calendar

³ Already approved in 2008-2009 but not reflected in the Calendar