**SFU** OFFICE OF THE ASSOCIATE VICE-PRESIDENT, ACADEMIC

8888 University Drive,   TEL: 778.782.4636   avpcio@sfu.ca
Burnaby, BC             FAX: 778.782.5876   www.sfu.ca/vpacademic
Canada V5A 1S6

**MEMORANDUM**

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| **ATTENTION** | Senate | **DATE** | February 7, 2014 |
| **FROM** | Gordon Myers, Chair | **PAGES** | 1/1 |
| | Senate Committee on | | |
| | Undergraduate Studies | | |
| **RE:** | Faculty of Science (SCUS 14-03) | | |

For information:

Acting under delegated authority at its meeting of February 6, 2014 SCUS approved the following curriculum revisions effective Fall 2014.

1. Department of Mathematics (SCUS 14-03f)

   (i) Requirement changes to the:
   - Applied Mathematics Major and Honours Programs,
   - Mathematics Major and Honours Programs,
   - Operations Research Major and Honours Programs
   - Math and Computing Science Major and Honours Programs

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MEMORANDUM

To:     Jo Hinchliffe
        Senate Committee on
        Undergraduate Studies

From:   George Agnes, Associate Dean, Academic
        Faculty of Science
        UG Curriculum Committee

Subject:  Faculty of Science Agenda Items for SCUS

Date:   January 27 2014

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The Undergraduate Curriculum Committee in the Faculty of Science has approved the following business items;

1. **Department of MATHEMATICS (MATH)**
**Requirement changes to:**
        Applied Mathematics Major and Honours Programs,
        Mathematics Major and Honours Programs,
        Operations Research Major and Honours Programs
        Math and Computing Science Major and Honours Programs
        effective Fall 2014."

Please place these items on the agenda of the next meeting of the Senate Committee on Undergraduate Studies.

Thank you.

George Agnes

**Summary of Changes**

(Agnes memo #6.1)

**Motion:** Add CMPT 130 and CMPT 135.

**Rationale - To change the Computing Science Requirements in the Applied Mathematics Major and Honours Programs, Mathematics Major and Honours Programs, Operations Research Major and Honours Programs, and Math and Computing Science Major and Honours Programs.**

**From (current description- Applied Mathematics Major and Honours Programs, Mathematics Major and Honours Programs, Operations Research Major and Honours Programs, and Math and Computing Science Major and Honours Programs):**

Students complete a minimum total of 36 units, including either one of

- CMPT 126 Introduction to Computing Science and Programming (3)
- CMPT 128 Introduction to Computing Science and Programming for Engineers (3)

or both of

- CMPT 120 Introduction to Computing Science and Programming I (3)
- CMPT 125 Introduction to Computing Science and Programming II (3)

etc.

**To (new description- Applied Mathematics Major and Honours Programs, Mathematics Major and Honours Programs, Operations Research Major and Honours Programs, and Math and Computing Science Major and Honours Programs):**

Students complete a minimum total of 36 units, including either one of

- CMPT 126 Introduction to Computing Science and Programming (3)
- CMPT 128 Introduction to Computing Science and Programming for Engineers (3)

or both of

- CMPT 120 Introduction to Computing Science and Programming I (3)

- CMPT 125 Introduction to Computing Science and Programming II (3)

or both of

- CMPT 130 - Introduction to Computer Programming I (3)
- CMPT 135 - Introduction to Computing Programming II (3)

etc.

Rationale: CMPT 130 and CMPT 135 are the first year computing courses at Surrey. They correspond to CMPT 120 and 125 for prerequisite purposes in the CMPT major.

(Agnes memo 6.2)

**Motion:** (Add PHYS 140 and 141)

**Rationale - To change the Physics requirements for the Applied Mathematics Major and Honours Programs.**

**From (current description- Applied Mathematics Major and Honours Programs):**

and one of

- PHYS 120 Mechanics and Modern Physics (3)
- PHYS 125 Mechanics and Special Relativity (3)

and one of

- PHYS 121 Optics, Electricity and Magnetism (3)
- PHYS 126 Electricity, Magnetism and Light (3)

**To (new description- Applied Mathematics Major and Honours Programs):**

and one of

- PHYS 120 - Mechanics and Modern Physics (3)
- PHYS 125 - Mechanics and Special Relativity (3)
- PHYS 140 - Studio Physics - Mechanics and Modern Physics (4)

and one of

- PHYS 121 - Optics, Electricity and Magnetism (3)
- PHYS 126 - Electricity, Magnetism and Light (3)
- PHYS 141 - Studio Physics - Optics, Electricity and Magnetism (4)

Rationale: PHYS 140 and 141 are first year Surrey Physics offerings and they both include a lab.

(Agnes motion 6.3)

**Motion:** (Add CMPT 127 and other updates)

**Rationale - To change the computing requirements for the MACM major and honors programs. There are 3 parts to this motion, all pertaining to MACM.**

**a) To change the lower division requirements in the MACM major program**

**From (current description- MACM major program):**

Students complete at least 36-41 units, including either one of

~~CMPT 126 - Introduction to Computing Science and Programming (3)~~

~~CMPT 128 - Introduction to Computing Science and Programming for Engineers (3)~~

 or both of

CMPT 120 - Introduction to Computing Science and Programming I (3)CMPT 125 - Introduction to Computing Science and Programming II (3)

and all of

CMPT 150 - Introduction to Computer Design (3)
CMPT 225 - Data Structures and Programming (3)
MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
STAT 270 - Introduction to Probability and Statistics (3)

and either

CMPT 275 - Software Engineering I (4)

or

~~MACM 202 - Mathematical Modeling and Computation (4)~~

or two of

MACM 203 - Computing with Linear Algebra (2)
MACM 204 - Computing with Calculus (2)
MATH 294 - Computational Studies in Mathematics (2)

etc.


## To (new description- MACM major program):

Lower Division Requirements

~~Students complete at least 36-41 units, including either one of~~
Students complete at least 39-44 units, including either all three of


~~CMPT 126 - Introduction to Computing Science and Programming (3)~~

~~CMPT 128 - Introduction to Computing Science and Programming for Engineers (3)~~

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 127 - Computing Laboratory (3)

or both of

CMPT 130 - Introduction to Computer Programming I (3)
CMPT 135 - Introduction to Computing Programming II (3)

and all of

CMPT 150 - Introduction to Computer Design (3)
CMPT 225 - Data Structures and Programming (3)
MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
STAT 270 - Introduction to Probability and Statistics (3)

and ~~either~~ ONE OF THE FOLLOWING

CMPT 275 - Software Engineering I (4)

or

MACM 202 - Mathematical Modeling and Computation (4)

CMPT 276 - Introduction to Software Engineering (3)

or two of

MACM 203 - Computing with Linear Algebra (2)
MACM 204 - Computing with Calculus (2)
MATH 294 - Computational Studies in Mathematics (2)
etc.

Rationale: Computing is introducing CMPT 127-3 as a co-requisite course for CMPT 125-3 as a new required course for Computing majors and honors students. It provides Computing students a full lab course devoted to learning to program. Since programming is the core skill for a computing degree, CMPT 127 should also be compulsory for MACM students.

CMPT 126 will no longer be offered hence is deleted as an option.

CMPT 128 has insufficient exposure to programming hence is deleted as an option.  CMPT 130-3 and 135-3 is the Surrey programming sequence. It includes lab time and hence is added as an option.

CMPT 276-3 is the Surrey offering in software engineering hence should be an alternate for the software engineering requirement.

MACM 202 is a discontinued course, last offered in Spring 2010. It has been replaced with the MACM 203, 204 and MATH 294 requirement. Therefore MACM 202 should now be deleted.

**b) To change the lower division requirements in the MACM honors program**

**From (current description - MACM honors program):**

Lower Division Requirements

Students complete at least 40-45 units, including either one of

~~CMPT 126 - Introduction to Computing Science and Programming (3) *~~
~~CMPT 128 - Introduction to Computing Science and Programming for Engineers~~
~~(3)~~

 or both of

CMPT 120 - Introduction to Computing Science and Programming I (3) *
CMPT 125 - Introduction to Computing Science and Programming II (3) *

and all of

CMPT 150 - Introduction to Computer Design (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 275 - Software Engineering I (4)
MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
STAT 270 - Introduction to Probability and Statistics (3)

and either

~~MACM 202 - Mathematical Modeling and Computation (4)~~

or two of

MACM 203 - Computing with Linear Algebra (2)
MACM 204 - Computing with Calculus (2)
MATH 294 - Computational Studies in Mathematics (2)

etc.

**To (new description- MACM honors program):**

Lower Division Requirements

~~Students complete at least 40-45 units, including either one of~~

<u>Students complete at least 44-48 units, including either all three of</u>

CMPT 126 - Introduction to Computing Science and Programming (3) *
CMPT 128 - Introduction to Computing Science and Programming for Engineers (3)

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 127 - Computing Laboratory (3)

 or both of

CMPT 130 - Introduction to Computer Programming I (3)
CMPT 135 - Introduction to Computing Programming II (3)

and all of

CMPT 150 - Introduction to Computer Design (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 275 - Software Engineering I (4)
MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
STAT 270 - Introduction to Probability and Statistics (3)

EITHER
and
MACM 202 - Mathematical Modeling and Computation (4)

CMPT 275 - Software Engineering I (4)

or

CMPT 276 - Introduction to Software Engineering (3)

and two of

MACM 203 - Computing with Linear Algebra (2)
MACM 204 - Computing with Calculus (2)
MATH 294 - Computational Studies in Mathematics (2)

etc.


Rationale: Computing is introducing CMPT 127-3 as a co-requisite course for CMPT 125-3 as a new required course for Computing majors and honors students. It provides Computing students a full lab course devoted to learning to program. Since programming is the core skill for a computing degree, CMPT 127 should also be compulsory for MACM students.

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CMPT 128 has insufficient exposure to programming hence is deleted as an option. CMPT 130-3 and 135-3 is the Surrey programming sequence. It includes lab time and hence is added as an option.

CMPT 276-3 is the Surrey offering in software engineering hence should be an alternate for the software engineering requirement.

MACM 202 is a discontinued course, last offered in Spring 2010. It has been replaced with the MACM 203, 204 and MATH 294 requirement. Therefore MACM 202 should now be deleted.

**c) To change the upper division requirements in the MACM honors program.**

**From (current description- MACM honors program):**

Additional course work is required to total 27 upper division MATH units and 30 upper division CMPT units including core requirements. etc.

**To (new description- MACM honors program):**

~~Additional course work is required to total 27 upper division MATH units and 30 upper division CMPT units including core requirements. etc.~~

Additional course work is required to total 27 upper division MATH units and 27 upper division CMPT units including core requirements. etc.

Rationale: Proposal 1 adds 3 credits of CMPT to the overall requirements for the MACM major and honors program for most students (for Burnaby students but not Surrey students). This adjustment makes it easier for honors students to complete their total credit requirement. We have not made any adjustment to the MACM major program upper division requirements, which total 45 because we see this as a minimum for a joint major.