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MEMORANDUM

ATTENTION Senate
FROM Wade Parkhouse, Chair
Senate Committee on
Undergraduate Studies
RE: Program Changes

DATE October 13, 2017
PAGES 1/2

For information:

Acting under delegated authority at its meeting of October 12, 2017 SCUS approved the following curriculum revisions effective Summer 2018.

a. Beedie School of Business (SCUS 17-44)

- (i) Upper division requirement changes to the:
- Business Minor, Major and Honours programs

b. Faculty of Communication, Art and Technology (SCUS 17-45)**1. School of Interactive Arts and Technology**

- (i) Requirement changes to the IAT BA and IAT BSc second degree programs
(ii) Requirement changes to the IAT BA, BSc, BA Honours, BSc Honours, BA second degree and BSc second degree

2. Faculty of Communication, Art and Technology

- (i) Requirement changes to the Faculty of Communication, Art and Technology Bachelor of Arts double minor program

3. School of Communication

- (i) Upper division requirement changes to the CMNS Honours (Option A and Option B) program

c. Faculty of Science (SCUS 17-46)

1. Department of Mathematics

- (i) Upper and Lower division requirement changes to the Mathematics Major program**
- (ii) Lower division requirement changes to the Mathematics Honours program**
- (iii) Lower division requirement changes to the:**
 - Applied Mathematics Major program**
 - Applied Mathematics Honours program**
- (iv) Upper and lower division requirement changes to the:**
 - Operations Research Major program**
 - Operations Research Honours program**



**Calendar Entry Change
Beedie School of Business Undergraduate Program**

SCUS 17-44

Rationale for change:

Current calendar language is misleading: in the course listing, 60 units are listed as the prerequisite on all 300-level Business courses. However, on another page in the calendar it says the prerequisite is 60 units for non-Business students and 45 for approved business students.

It is not possible to code two different sets of prerequisites on a course (one set for Business students and one set for non-business students), so these are coded as 45 units for everyone. This language was originally used to reduce non-Business student access to upper-division Business courses. However, we are currently using course seat reserves, which has been an effective method for this.

This messaging is confusing to students and causes an increase in questions to the advising office from both Business and non-Business students who are trying to figure out if they meet the course prerequisites.

Having consistent, accurate language in both sections of the calendar will clarify the information for students.

This change in language states what the actual practice is (rather than stating something we are not implementing).

Effective term and year:

Fall 2018

The following program(s) will be affected by these changes:

Business Minor

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Upper Division Requirements

~~All upper division BUS courses have a prerequisite of 60 units but approved business minors may complete the designated upper division BUS courses upon completion of 45 units and acceptance into the business minor program.~~

At least 16 upper division BUS units** are required including all of



BUS 311 - Introduction to Managerial Accounting and Financial Management (4)

BUS 341 - Fundamentals of Marketing (4)

BUS 340 - International Business Strategy (4)

BUS 401 - Developing Organizational Opportunities (4)

** A minimum of eight upper division units used toward the minor must have been completed at Simon Fraser University.



**Calendar Entry Change
Beedie School of Business Undergraduate Program**

Rationale for change:

Current calendar language is misleading: in the course listing, 60 units are listed as the prerequisite on all 300-level Business courses. However, on another page in the calendar it says the prerequisite is 60 units for non-Business students and 45 for approved business students.

It is not possible to code two different sets of prerequisites on a course (one set for Business students and one set for non-business students), so these are coded as 45 units for everyone. This language was originally used to reduce non-Business student access to upper-division Business courses. However, we are currently using course seat reserves, which has been an effective method for this.

This messaging is confusing to students and causes an increase in questions to the advising office from both Business and non-Business students who are trying to figure out if they meet the course prerequisites.

Having consistent, accurate language in both sections of the calendar will clarify the information for students.

This change in language states what the actual practice is (rather than stating something we are not implementing).

Effective term and year:

Fall 2018

The following program(s) will be affected by these changes:

Business Major
Business Honours

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Upper Division Access

All upper division BUS courses have a prerequisite of 60 units. However, approved business majors, joint majors, honours, joint honours, double degrees, and minors may



~~complete 300 division BUS courses upon completion of 45 units.~~

~~If any students enrol in 400 level business courses before completing the first 60 lower division units, these courses will not count as fulfilling the 45 upper division units required in the final 60 units of the program, nor as part of the upper division units for the business majors, joint majors, honours, joint honours, double degrees, and minors.~~

Calendar Entry Change
School of Interactive Arts and Technology

Rationale for change: To align the Interactive Systems Concentration requirements for the IAT Second Degree BA and BSc with the IAT BA and BSc.
Effective term and year: Summer 2018
The following program(s) will be affected by these changes: IAT BA second degree, and IAT BSc second degree

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Interactive Systems</p> <p>Students in this concentration learn how to design and program interactive technology used in work, play and learning.</p> <p>This concentration emphasizes applying human-computer interaction principles to highly interactive applications, devices and systems. Graduates will be able to conceive, design and program applications in areas such as the web, handheld devices and games.</p> <p>Students who choose this concentration complete a# six of</p> <p>IAT 351 - Advanced Human-Computer Interaction (3) IAT 352 - Internet Computing Technologies (3) IAT 355 - Introduction to Visual Analytics (3) IAT 359 - Mobile Computing (3) IAT 410 - Advanced Game Design (3) IAT 452 - Developing Design Tools (3) IAT 455 - Computational Media (3)</p>



Calendar Entry Change
School of Interactive Arts and Technology

Rationale for change: Add two additional courses as options within the Design concentration to allow for wider access to required courses, increased completion of the design concentration, and in recognition of the critical content taught in IAT 339 and 432 to the design concentration.
Effective term and year: Summer 2018
The following program(s) will be affected by these changes: IAT BA, BSc, BA Honours, BSc Honours, BA second degree, and BSc second degree

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Design</p> <p>This concentration focuses on the design and use of interactive products and systems. It emphasizes designing and understanding all aspects of successful designs. Graduates will demonstrate ability in contemporary design from requirements through design to critique and evaluation.</p> <p>Students who choose this concentration complete all six (6) of</p> <p>IAT 333 - Interaction Design Methods (3) IAT 334 - Interface Design (3) IAT 336 - Materials in Design (3) IAT 339 – Web Design and Development (3) IAT 431 - Speculative Design (3) IAT 432 – Design Evaluation (3) IAT 437 - Representation and Fabrication (3) IAT 438 - Interactive Objects and Environments (3)</p>

Calendar Entry Change
Name of Program or Name of Faculty

Rationale for change: Summer 2018
Effective term and year:
The following program(s) will be affected by these changes: Faculty of Communication, Art and Technology Bachelor of Arts (double minor program)

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Bachelor of Arts Program</p> <p>BA with two minors; two extended minors; or a minor and extended minor</p> <p>Admission Requirements:</p> <p>Internal University transfer requires a 2.00 or better CGPA, and a minimum of two minors, two extended minors, or a minor and extended minor declared prior to being admitted the double minor program.</p> <p>Program Requirements:</p>
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Calendar Entry Change

Name of Program or Name of Faculty:

School of Communication (CMNS)

Rationale for change: <i>We have a new "W" course now, so it should be an option for CMNS Honours students.</i>	
Effective term and year:	2018. SUMMER
The following program(s) will be affected by these changes: CMNS Honours (Option A and Option B).	

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Option A: Honours Project

A minimum total of 60 upper division units is required, to include the following:

- seven upper division CMNS courses, at least four must be taken at SFU.
- minimum of two 400 level CMNS courses, at least one must be taken at SFU.

CMNS 304W - Communication in Everyday Life (4), ~~or~~ CMNS 323W - Cultural Dimensions in Advertising (4) **or CMNS 455W – Women and New Information Technologies (4)**
 CMNS 362 - Evaluation Methods for Applied Communication Research (6)
 CMNS 497 - Honours Research Proposal (5) *
 CMNS 498 - Honours Research Project (10) **

*Students must complete at least 90 units with at least 20 units in upper division communication before enrolling in CMNS 497. A plan must be approved by the faculty member supervisor(s) and the honours co-ordinator before work is begun.

**Students must obtain a grade of B or higher in CMNS 497 in order to continue on with CMNS 498.

Students who obtain a grade of B- or lower in CMNS 497, but who still have an overall CGPA of 3.00 or higher, can still complete an honours degree through Option B.



Option B: Additional Upper Division Requirements

A minimum total of 60 upper division units is required, to include the following:

- eleven upper division CMNS courses, at least eight must be taken at SFU.
- minimum of six 400 level CMNS courses, at least five must be taken at SFU.

CMNS 304W - Communication in Everyday Life (4), ~~or~~ CMNS 323W - Cultural Dimensions in Advertising (4) **or CMNS 455W – Women and New Information Technologies (4)**
CMNS 362 - Evaluation Methods for Applied Communication Research (6)



Calendar Entry Change: Lower and Upper Division Requirements for Mathematics Major Program

Name of Program or Name of Faculty: Department of Mathematics

Rationale for change:

Changes to CMPT 128 content makes CMPT 129 now the appropriate intro to computing course. We have removed other equivalencies, but replaced with an indication that students transferring to a Mathematics degree might substitute these with other credits.

The list of upper division STAT option courses that is allowable is more succinctly indicated by an exclusion rule. This will also be more robust to potential future changes in the STAT course offerings.

Effective term and year:

2018 **SUMMER**

The following program(s) will be affected by these changes:

Mathematics Major Program

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Program Requirements

Students complete 120 units, as specified below.

Lower Division Requirements

Students complete

both of

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

CMPT 129 - Introduction to Computing Science and Programming for Mathematics and Statistics (3)

~~(or equivalent: CMPT 125 (3) or CMPT 126 (3) or CMPT 128 (3))~~



(Students transferring into a math program should contact the math undergraduate advisor if they have already completed equivalent courses)

or both of

CMPT 130 - Introduction to Computer Programming I (3)

CMPT 135 - Introduction to Computer Programming II (3)

and all of

MACM 101 - Discrete Mathematics I (3)

MACM 201 - Discrete Mathematics II (3)

MACM 203 - Computing with Linear Algebra (2) +

MACM 204 - Computing with Calculus (2) +

MATH 242 - Introduction to Analysis I (3)

MATH 251 - Calculus III (3)

STAT 270 - Introduction to Probability and Statistics (3)

and one of

MATH 150 - Calculus I with Review (4)

MATH 151 - Calculus I (3) *

MATH 154 - Calculus I for the Biological Sciences (3) **

MATH 157 - Calculus I for the Social Sciences (3) **

and one of

MATH 152 - Calculus II (3) *

MATH 155 - Calculus II for the Biological Sciences (3) **

MATH 158 - Calculus II for the Social Sciences (3) **

and one of

MATH 232 - Applied Linear Algebra (3) **

MATH 240 - Algebra I: Linear Algebra (3) *

+ The following substitutions are also permitted. They may not also be used to satisfy the upper division requirements below.

MACM 409 - Numerical Linear Algebra: Algorithms, Implementation and Applications (3) for MACM 203.

MACM 401 - Introduction to Computer Algebra (3) for MACM 204.



MACM 442 - Cryptography (3) for MACM 204.

* strongly recommended

** with a B grade or better

Upper Division Requirements

Students complete a minimum of 30 program units, including the 15 outlined below.

MATH 340 - Algebra II: Rings and Fields (3)

and one of

MATH 343 - Applied Discrete Mathematics (3)

MATH 345 - Introduction to Graph Theory (3)

MATH 408 - Discrete Optimization (3)

MATH 443 - Combinatorial Theory (3)

MATH 447 - Coding Theory (3)

and one of

MATH 320 - Introduction to Analysis II (3)

MATH 322 - Complex Variables (3)

and one of

MATH 338 - Advanced Linear Algebra (3)

MATH 341 - Algebra III: Groups (3)

MATH 342 - Elementary Number Theory (3)

and one of

MATH 310 - Introduction to Ordinary Differential Equations (3)

MACM 316 - Numerical Analysis I (3)

The remaining 15 units can be chosen from any upper division MATH or MACM course. Up to 6 of the 15 units can be chosen from the list below.

PHYS 413 - Advanced Mechanics (3)

~~STAT 330 - Introduction to Mathematical Statistics (3)~~

~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~

~~STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)~~

~~STAT 350 - Linear Models in Applied Statistics (3)~~



~~STAT 380 – Introduction to Stochastic Processes (3)~~

~~STAT 430 – Statistical Design and Analysis of Experiments (3)~~

~~STAT 445 – Applied Multivariate Analysis (3)~~

~~STAT 450 – Statistical Theory (3)~~

~~STAT 460 – Bayesian Statistics (3)~~

~~STAT 475 – Applied Discrete Data Analysis (3)~~

~~STAT 485 – Applied Time Series Analysis (3)~~

Any upper division STAT course except for STAT 302, STAT 305, and STAT 403



Calendar Entry Change: Lower Division Requirements for Mathematics Honours Program

Name of Program or Name of Faculty: Department of Mathematics

Rationale for change: Changes to CMPT 128 content makes CMPT 129 now the appropriate intro to computing course. We have removed other equivalencies, but replaced with an indication that students transferring to a Mathematics degree might substitute these with other credits.
Effective term and year: 2018 SUMMER
The following program(s) will be affected by these changes: Mathematics Honours Program

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Program Requirements</p> <p>Students complete 120 units, as specified below.</p> <p>Lower Division Requirements</p> <p>Students complete either</p> <p>both of</p> <p><u>CMPT 120</u> - Introduction to Computing Science and Programming I (3) <u>CMPT 129</u> - Introduction to Computing Science and Programming for Mathematics and Statistics (3)</p> <p>(or equivalent: CMPT 125 (3) or CMPT 126(3) or CMPT 128 (3))</p> <p>(Students transferring into a math program should contact the math undergraduate advisor if they have already completed equivalent courses)</p>



or both of

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

and all of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)
MACM 203 - Computing with Linear Algebra (2) +
MACM 204 - Computing with Calculus (2) +
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
MATH 252 - Vector Calculus (3)
STAT 270 - Introduction to Probability and Statistics (3)

and one of

MATH 150 - Calculus I with Review (4)
MATH 151 - Calculus I (3) *
MATH 154 - Calculus I for the Biological Sciences (3) **
MATH 157 - Calculus I for the Social Sciences (3) **

and one of

MATH 152 - Calculus II (3) *
MATH 155 - Calculus II for the Biological Sciences (3) **
MATH 158 - Calculus II for the Social Sciences (3) **

and one of

MATH 232 - Applied Linear Algebra (3) **
MATH 240 - Algebra I: Linear Algebra (3) *

and at least one of

CMPT 225 - Data Structures and Programming (3)
STAT 285 - Intermediate Probability and Statistics (3)

+The following substitutions are also permitted.

They may not be used to satisfy the upper division requirements below.



MACM 409 - Numerical Linear Algebra: Algorithms, Implementation and Applications (3) for MACM 203.

MACM 401 - Introduction to Computer Algebra (3) for MACM 204.

MACM 442 - Cryptography (3) for MACM 204.

* strongly recommended

** with a B grade or better



Calendar Entry Change: Lower Division Requirements for Applied Mathematics Major Program

Name of Program or Name of Faculty: Department of Mathematics

<p>Rationale for change: Changes to CMPT 128 content makes CMPT 129 now the appropriate intro to computing course. We have removed other equivalencies, but replaced with an indication that students transferring to a Mathematics degree might substitute these with other credits.</p> <p>MSE 250 is added to a list of non-math option courses that represent an application of applied mathematical thinking. It is a course choice that is available at Surrey.</p>
<p>Effective term and year: 2018 SUMMER</p>
<p>The following program(s) will be affected by these changes: Applied Mathematics Major Program</p>

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Program Requirements</p> <p>Students complete 120 units, as specified below.</p> <p>Lower Division Requirements</p> <p>Students complete the following:</p> <p>both of</p> <p><u>CMPT 120</u> - Introduction to Computing Science and Programming I (3) <u>CMPT 129</u> - Introduction to Computing Science and Programming for Mathematics and Statistics (3)</p> <p>(or equivalent: CMPT 125 (3) or CMPT 126 (3) or CMPT 128 (3))</p> <p>(students transferring into a math program should contact the math undergraduate advisor if they have already completed equivalent courses)</p>



or both of

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

and all of

MACM 203 - Computing with Linear Algebra (2) +
MACM 204 - Computing with Calculus (2) +
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
MATH 252 - Vector Calculus (3)
STAT 270 - Introduction to Probability and Statistics (3)

and one of

MATH 150 - Calculus I with Review (4)
MATH 151 - Calculus I (3)
MATH 154 - Calculus I for the Biological Sciences (3) **
MATH 157 - Calculus I for the Social Sciences (3) **

and one of

MATH 152 - Calculus II (3) *
MATH 155 - Calculus II for the Biological Sciences (3) **
MATH 158 - Calculus II for the Social Sciences (3) **

and one of

MATH 232 - Applied Linear Algebra (3) **
MATH 240 - Algebra I: Linear Algebra (3)

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)



and at least one of

CMPT 225 - Data Structures and Programming (3)

ENSC 220 - Electric Circuits I (4)

MACM 201 - Discrete Mathematics II (3)

MSE 250 - Electric Circuits (4)

PHIL 210 - Natural Deductive Logic (3)

PHYS 211 - Intermediate Mechanics (3)

STAT 285 - Intermediate Probability and Statistics (3)

+ The following substitutions are also permitted.

They may not also be used to satisfy the upper division requirements below.

MACM 409 - Numerical Linear Algebra: Algorithms, Implementation and Applications (3)
for MACM 203.

MACM 401 - Introduction to Computer Algebra (3) for MACM 204.

MACM 442 - Cryptography (3) for MACM 204.

* strongly recommended

** with a B grade or better



Calendar Entry Change: Lower Division Requirements for Applied Mathematics Honours Program

Name of Program or Name of Faculty: Department of Mathematics

<p>Rationale for change: Changes to CMPT 128 content makes CMPT 129 now the appropriate intro to computing course. We have removed other equivalencies, but replaced with an indication that students transferring to a Mathematics degree might substitute these with other credits.</p> <p>MSE 250 is added to a list of non-math option courses that represent an application of applied mathematical thinking. It is a course choice that is available at Surrey.</p>
<p>Effective term and year: 2018 SUMMER</p>
<p>The following program(s) will be affected by these changes: Applied Mathematics Honours Program</p>

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Program Requirements</p> <p>Students complete 120 units, as specified below.</p> <p>Lower Division Requirements</p> <p>Students complete 40 units, including either</p> <p>both of</p> <p><u>CMPT 120</u> - Introduction to Computing Science and Programming I (3) <u>CMPT 129</u> - Introduction to Computing Science and Programming for Mathematics and Statistics (3)</p> <p>(or equivalent: CMPT 125 (3) or CMPT 126 (3) or CMPT 128 (3))</p>
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(students transferring into a math program should contact the math undergraduate advisor if they have already completed equivalent courses)

or both of

CMPT 130 - Introduction to Computer Programming I (3)

CMPT 135 - Introduction to Computer Programming II (3)

and all of

MACM 203 - Computing with Linear Algebra (2) +

MACM 204 - Computing with Calculus (2) +

MATH 242 - Introduction to Analysis I (3)

MATH 251 - Calculus III (3)

MATH 252 - Vector Calculus (3)

STAT 270 - Introduction to Probability and Statistics (3)

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)

and one of

MATH 150 - Calculus I with Review (4)

MATH 151 - Calculus I (3) *

MATH 154 - Calculus I for the Biological Sciences (3) **

MATH 157 - Calculus I for the Social Sciences (3) **

and one of

MATH 152 - Calculus II (3) *

MATH 155 - Calculus II for the Biological Sciences (3) **

MATH 158 - Calculus II for the Social Sciences (3) **

and one of



MATH 232 - Applied Linear Algebra (3) **

MATH 240 - Algebra I: Linear Algebra (3) *

and at least one of

CMPT 225 - Data Structures and Programming (3)

ENSC 220 - Electric Circuits I (4)

MACM 201 - Discrete Mathematics II (3)

MSE 250 - Electric Circuits (4)

PHIL 210 - Natural Deductive Logic (3)

PHYS 211 - Intermediate Mechanics (3)

STAT 285 - Intermediate Probability and Statistics (3)

* strongly recommended

** with a B grade or better

+ The following substitutions are also permitted. They may not be used to satisfy the upper division requirements below. MACM 409 - Numerical Linear Algebra: Algorithms, Implementation and Applications (3) for MACM 203. MACM 401 - Introduction to Computer Algebra (3) for MACM 204. MACM 442 - Cryptography (3) for MACM 204.



Calendar Entry Change: Lower and Upper Division Requirements for Operations Research Major Program

Name of Program or Name of Faculty: Department of Mathematics

Rationale for change:

Changes to CMPT 128 content makes CMPT 129 now the appropriate intro to computing course. We have removed other equivalencies, but replaced with an indication that students transferring to a Mathematics degree might substitute these with other credits.

The list of upper division STAT option courses that is allowable is more succinctly indicated by an exclusion rule. This will also be more robust to potential future changes in the STAT course offerings.

Effective term and year:

; 2018 **SUMMER**

The following program(s) will be affected by these changes:

Operations Research Major Program

Calendar Change: “to” and “from” sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

Program Requirements

The program requires the completion of 120 units which includes a Faculty of Science requirement of a minimum of 28 upper division units, and additional upper division units to total a minimum of 44 upper division units (excluding EDUC 401, 407).

The specific program requirements are divided into three parts: required lower division courses, required upper division courses, and completion of an interdisciplinary requirement.

In addition to the program requirements set out below, general university and Faculty of Science regulations must be met.

Computing science courses that are completed in the operations research major program will count towards the requirement that 12 units must be completed from outside of the Faculty of Science.

A minimum program 2.00 cumulative grade point average (CGPA) must be obtained on the overall major program requirements, as well as a minimum program 2.00 grade point average in the upper division major courses.

Lower Division Requirements

Students complete

both of

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

CMPT 129 - Introduction to Computing Science and Programming for Mathematics and Statistics (3)

~~(or equivalent: CMPT 125 (3) or CMPT 126 (3) or CMPT 128 (3))~~

(Students transferring into a math program should contact the math undergraduate advisor if they have already completed equivalent courses)

or both of

CMPT 130 - Introduction to Computer Programming I (3)

CMPT 135 - Introduction to Computer Programming II (3)

and all of

CMPT 225 - Data Structures and Programming (3)

MACM 101 - Discrete Mathematics I (3)

MACM 201 - Discrete Mathematics II (3)

MATH 208W - Introduction to Operations Research (3)

MATH 251 - Calculus III (3)

STAT 270 - Introduction to Probability and Statistics (3)

STAT 285 - Intermediate Probability and Statistics (3)

and one of

MATH 150 - Calculus I with Review (4)

MATH 151 - Calculus I (3)

MATH 154 - Calculus I for the Biological Sciences (3) *

MATH 157 - Calculus I for the Social Sciences (3) *

and one of

MATH 152 - Calculus II (3)

MATH 155 - Calculus II for the Biological Sciences (3) *

MATH 158 - Calculus II for the Social Sciences (3) *

and one of

MATH 232 - Applied Linear Algebra (3) *

MATH 240 - Algebra I: Linear Algebra (3)

* with a B grade or better

Upper Division Requirements

Students complete all of

MATH 308 - Linear Optimization (3)

MATH 348 - Probabilistic Models in Operations Research (3)

MATH 402W - Operations Research Clinic (4)

and four of

MATH 309 - Continuous Optimization (3)

MATH 408 - Discrete Optimization (3)

MATH 448 - Network Flows (3)

STAT 350 - Linear Models in Applied Statistics (3)

STAT 380 - Introduction to Stochastic Processes (3)

and at least one of

CMPT 305 - Computer Simulation and Modelling (3)

CMPT 307 - Data Structures and Algorithms (3)

MACM 316 - Numerical Analysis I (3)

MATH 343 - Applied Discrete Mathematics (3)

MATH 345 - Introduction to Graph Theory (3)

and at least 6 additional units from the following list

ECON 435 - Econometric Methods (5)

~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~

~~STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)~~

~~STAT 410 - Statistical Analysis of Sample Surveys (3)~~



~~STAT 430 – Statistical Design and Analysis of Experiments (3)~~

~~STAT 460 – Bayesian Statistics (3)~~

~~STAT 475 – Applied Discrete Data Analysis (3)~~

~~STAT 485 – Applied Time Series Analysis (3)~~

Any upper division STAT course except for STAT 302, STAT 305, and STAT 403



Calendar Entry Change: Lower and Upper Division Requirements for Operations Research Honours Program

Name of Program or Name of Faculty: Department of Mathematics

<p>Rationale for change: Changes to CMPT 128 content makes CMPT 129 now the appropriate intro to computing course. We have removed other equivalencies, but replaced with an indication that students transferring to a Mathematics degree might substitute these with other credits.</p> <p>The list of upper division STAT option courses that is allowable is more succinctly indicated by an exclusion rule. This will also be more robust to potential future changes in the STAT course offerings.</p>
<p>Effective term and year: 2018 SUMMER</p>
<p>The following program(s) will be affected by these changes: Operations Research Honours Program</p>

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample~~. All additions should be marked by a **bold**.

<p>Program Requirements</p> <p>The program requires the completion of 120 units. The Faculty of Science stipulates that a minimum of 48 units must be in upper division, and that additional upper division units will be required to total a minimum of 60.</p> <p>The specific requirements for this particular program are divided into three parts: required lower division courses, required upper division courses, and completion of an interdisciplinary requirement.</p> <p>In addition to the program requirements set out below, general university regulations must be met.</p>
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A minimum program 3.00 cumulative grade point average (CGPA) must be obtained on the overall major program requirements, as well as a minimum program 3.00 grade point average in the upper division major courses.

Lower Division Requirements

Students complete

both of

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

CMPT 129 - Introduction to Computing Science and Programming for Mathematics and Statistics (3)

~~(or equivalent: CMPT 125 (3) or CMPT 126 (3) or CMPT 128 (3))~~

(Students transferring into a math program should contact the math undergraduate advisor if they have already completed equivalent courses)

or both of

CMPT 130 - Introduction to Computer Programming I (3)

CMPT 135 - Introduction to Computer Programming II (3)

and all of

CMPT 225 - Data Structures and Programming (3)

MACM 101 - Discrete Mathematics I (3)

MACM 201 - Discrete Mathematics II (3)

MATH 208W - Introduction to Operations Research (3)

MATH 251 - Calculus III (3)

STAT 270 - Introduction to Probability and Statistics (3)

STAT 285 - Intermediate Probability and Statistics (3)

and one of

MATH 150 - Calculus I with Review (4)

MATH 151 - Calculus I (3)

MATH 154 - Calculus I for the Biological Sciences (3) *

MATH 157 - Calculus I for the Social Sciences (3) *

and one of

MATH 152 - Calculus II (3)



MATH 155 - Calculus II for the Biological Sciences (3) *
MATH 158 - Calculus II for the Social Sciences (3) *

and one of

MATH 232 - Applied Linear Algebra (3) *
MATH 240 - Algebra I: Linear Algebra (3)

* with a B grade or better

Upper Division Requirements

Students complete a total of 48 units, including all of

MATH 308 - Linear Optimization (3)
MATH 348 - Probabilistic Models in Operations Research (3)
MATH 402W - Operations Research Clinic (4)

and five of

MATH 309 - Continuous Optimization (3)
MATH 320 - Introduction to Analysis II (3)
MATH 408 - Discrete Optimization (3)
MATH 448 - Network Flows (3)
STAT 350 - Linear Models in Applied Statistics (3)
STAT 380 - Introduction to Stochastic Processes (3)

and at least one of

CMPT 305 - Computer Simulation and Modelling (3)
CMPT 307 - Data Structures and Algorithms (3)
MACM 316 - Numerical Analysis I (3)
MATH 343 - Applied Discrete Mathematics (3)
MATH 345 - Introduction to Graph Theory (3)

and at least 6 additional units from the following list

ECON 435 - Econometric Methods (5)
~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~
~~STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)~~
~~STAT 410 - Statistical Analysis of Sample Surveys (3)~~
~~STAT 430 - Statistical Design and Analysis of Experiments (3)~~
~~STAT 460 - Bayesian Statistics (3)~~
~~STAT 475 - Applied Discrete Data Analysis (3)~~



~~STAT 485 - Applied Time Series Analysis (3)~~

Any upper division STAT course except for STAT 302, STAT 305, and STAT 403