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MEMORANDUM

ATTENTION	Senate	DATE	December 8, 2023
FROM	Peter Hall, Chair Senate Committee on Undergraduate Studies	PAGES	1/2
RE:	Program Changes		

For information:

Acting under delegated authority at its meeting of December 7, 2023 SCUS approved the following curriculum revisions effective Fall 2024.

a. Faculty of Applied Sciences *(SCUS 23-106)*

1. School of Computing Science

(i) Requirement changes to the:
- Computing Science Major
- Computing Science Second Degree Major
- Computing Science Honours
- Computing Science Minor
- Computing Science Post Baccalaureate Diploma
- Computing Science Dual Degree Program
- Information Systems in Business Administration and Computing Science Joint Major
- Computing Science and Linguistics Joint Major
- Software Systems Major

2. School of Mechatronic Systems Engineering *(SCUS 23-99)*

(i) Requirement changes to the:
- Mechatronic Systems Engineering Major
- Mechatronic Systems Engineering Honours
- Mechatronic Systems Engineering and Business Double Degree Program

b. Faculty of Environment *SCUS 23-107)*

1. School of Resource and Environmental Management

(i) Requirement changes to the:
- Resource and Environmental Management Major
- Resource and Environmental Management Honours
- Sustainable Development Minor

c. Faculty of Science *SCUS 23-108)*

1. Department of Molecular Biology and Biochemistry

(i) Requirement changes to the Concentration in Infection and Immunity
- Molecular Biology and Biochemistry Major
- Molecular Biology and Biochemistry Honours

2. Department of Statistics and Actuarial Sciences

(i) Upper and lower division requirement changes to the:
- Statistics Major
- Statistics Minor
- Statistics Honours
- Actuarial Science Major
- Actuarial Science Honours
- Data Science Major
- Data Science Honours

Senators wishing to consult a more detailed report of curriculum revisions may do so on the Senate Docushare repository at https://docushare.sfu.ca/dsweb/View/Collection-12682.

SFU SENATE COMMITTEE ON UNDERGRADUATE STUDIES

PROGRAM MODIFICATION TEMPLATE

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science Major

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.**

Lower Division Requirements

Students must complete the courses listed below. It is suggested that students complete a recommended schedule of courses within the first two years.

Students complete all of

CMPT 105W - Social Issues and Communication Strategies in Computing Science (3)
CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 201 – Systems Programming (3)
CMPT 210 – Probability and Computing (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)
MACM 101 - Discrete Mathematics I (3)
STAT 271 - Probability and Statistics for Computing Science (3)
(…)

Breadth Requirement

Five courses from five of the six Table I areas of concentration (see below) must be completed **including:** ~~including both of~~

~~CMPT 300 - Operating Systems I (3)~~
CMPT 307 - Data Structures and Algorithms (3)

CMPT 354 is also recommended.

(…)

COMPUTING SYSTEMS

~~CMPT 300 - Operating Systems I (3)~~
CMPT 303 – Operating Systems (3)
CMPT 305 - Computer Simulation and Modelling (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 379 - Principles of Compiler Design (3)
CMPT 403 - System Security and Privacy (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)
CMPT 450 - Computer Architecture (3)
CMPT 471 - Networking II (3)
CMPT 479 - Special Topics in Computing Systems (3)
CMPT 499 - Special Topics in Computer Hardware (3)

[…]

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science Second Degree Program Major

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.**

Computing Science Second Degree Program Major

[…]

Program Requirements
[…]
Lower Division Requirements

[…]

Breadth Requirement

Five courses from five of the six Table I areas of concentration must be completed including ~~both of~~

~~CMPT 300 - Operating Systems I (3)~~

CMPT 307 - Data Structures and Algorithms (3)

CMPT 354 is also recommended.

[…]

Table 1 – Computing Science Concentrations

[…]

COMPUTING SYSTEMS

~~CMPT 300 - Operating Systems I (3)~~

CMPT 303 – Operating Systems (3)

CMPT 305 - Computer Simulation and Modelling (3)

CMPT 371 - Data Communications and Networking (3)

CMPT 379 - Principles of Compiler Design (3)

CMPT 403 - System Security and Privacy (3)

CMPT 431 - Distributed Systems (3)

CMPT 433 - Embedded Systems (3)

CMPT 450 - Computer Architecture (3)

CMPT 471 - Networking II (3)

CMPT 479 - Special Topics in Computing Systems (3)

CMPT 499 - Special Topics in Computer Hardware (3)

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science Honours BACHELOR OF SCIENCE OR BACHELOR OF ARTS

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.**

[…] Computing Science Honours BACHELOR OF SCIENCE OR BACHELOR OF ARTS […] Internal Transfer […] Simon Fraser University students applying for School of Computing Science admission are selected on the basis of an admission Computing Related Grade Point Average (CRGPA) and Cumulative Grade Point Average (CGPA). The CRGPA is computed from all courses the student has taken from the following: (CMPT 120, 128 or 130), (CMPT 125, 129 or 135), CMPT 225, (CMPT 275 or 276), CMPT 295, **CMPT 201**, ~~CMPT 300,~~ CMPT 307, MACM 101, (CMPT 210 or MACM 201), MACM 316. Applicants must have completed at least one MACM course and at least two CMPT courses from this list before applying. At least two courses used in the CRGPA calculation must have been taken at SFU.

[…]

Lower Division Requirements

Students must complete the ~~following~~ ~~curriculum~~ **courses listed below**. It is suggested that students complete a recommended schedule of courses within the first two years.

Students complete all of

CMPT 105W - Social Issues and Communication Strategies in Computing Science (3)
CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 201 – Systems Programming (3)
CMPT 210 - Probability and Computing (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)
MACM 101 - Discrete Mathematics I (3)
STAT 271 - Probability and Statistics for Computing Science (3)

[…]

Upper Division Requirements

[…]

Breadth Requirement
One course in each of the six areas of Table I is required. These courses must include

~~CMPT 300 - Operating Systems I (3)~~
CMPT 307 - Data Structures and Algorithms (3)
CMPT 354 - Database Systems I (3)
[...]
Table I – Computing Science Concentrations

[…]

COMPUTING SYSTEMS
~~CMPT 300 - Operating Systems I (3)~~
CMPT 303 – Operating Systems (3)
CMPT 305 - Computer Simulation and Modelling (3)
CMPT 371 - Data Communications and Networking (3)

CMPT 379 - Principles of Compiler Design (3)
CMPT 403 - System Security and Privacy (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)
CMPT 450 - Computer Architecture (3)
CMPT 471 - Networking II (3)
CMPT 479 - Special Topics in Computing Systems (3)
CMPT 499 - Special Topics in Computer Hardware (3)

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science 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.**

Computing Science Minor […] Program Requirements Lower Division Requirements […] Upper Division Requirements […] COMPUTING SYSTEMS ~~CMPT 300 - Operating Systems I (3)~~

CMPT 303 – Operating Systems (3)
CMPT 305 - Computer Simulation and Modelling (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 379 - Principles of Compiler Design (3)
CMPT 403 - System Security and Privacy (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)
CMPT 450 - Computer Architecture (3)
CMPT 471 - Networking II (3)
CMPT 479 - Special Topics in Computing Systems (3)
CMPT 499 - Special Topics in Computer Hardware (3)

[…]

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science Post Baccalaureate Diploma

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 an approved program consisting of at least 30 units which include the following or equivalent. ~~CMPT 300 - Operating Systems I (3)~~ CMPT 307 - Data Structures and Algorithms (3) CMPT 354 - Database Systems I (3) […]

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science Dual Degree Program Major

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 Lower Division Requirements BSc/BEng Option […] BSc/Master of Finance Option Students complete all of BUS 232 - Business Statistics (3) CMPT 105W - Social Issues and Communication Strategies in Computing Science (3) CMPT 120 - Introduction to Computing Science and Programming I (3) CMPT 125 - Introduction to Computing Science and Programming II (3) **CMPT 201 – Systems Programming (3)** CMPT 210 **-** Probability and Computing (3) CMPT 225 - Data Structures and Programming (3)

CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)
ECON 105 - Principles of Macroeconomics (4)
MACM 101 - Discrete Mathematics I (3)
MATH 151 - Calculus I (3)
MATH 152 - Calculus II (3)

[…]

Upper Division Requirements

BSc/BEng students complete the following upper division courses or equivalent. Students should consult an advisor before commencing upper division requirements. Course substitutions may be approved in consultation with an advisor.

Breadth Requirement

Seven courses from five of the six Table 1 areas of concentration must be completed including

~~CMPT 300 - Operating Systems I (3)~~
CMPT 307 - Data Structures and Algorithms (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 354 - Database Systems I (3)
[…]

Table I – Computing Science Concentrations

[…]

COMPUTING SYSTEMS
~~CMPT 300 - Operating Systems I (3)~~
CMPT 303 – Operating Systems (3)
CMPT 305 - Computer Simulation and Modelling (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 379 - Principles of Compiler Design (3)
CMPT 403 - System Security and Privacy (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)
CMPT 450 - Computer Architecture (3)
CMPT 471 - Networking II (3)
CMPT 479 - Special Topics in Computing Systems (3)
CMPT 499 - Special Topics in Computer Hardware (3)

[…]

Minimum Unit and Residency Requirement

[…]

Breadth Requirement

Students complete all of
~~CMPT 300 - Operating Systems I (3)~~
CMPT 307 - Data Structures and Algorithms (3)
CMPT 310 - Introduction to Artificial Intelligence (3)
CMPT 354 - Database Systems I (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 376W - Professional Responsibility and Technical Writing (3)

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective. We also remove CMPT 301 language from the program listing, as it no longer exists.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Information Systems in Business Administration and Computing Science Joint Major BACHELOR OF BUSINESS ADMINISTRATION OR BACHELOR OF SCIENCE

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

Lower Division Requirements

Students complete one of

BUS 232 - Business Statistics (3)
ECON 233 - Introduction to Economic Data and Statistics (3)
~~STAT 270 - Introduction to Probability and Statistics (3)~~
STAT 271 - Probability and Statistics for Computing Science (3)

[…]

and all of

BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)

BUS 254 - Managerial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)
CMPT 201 - Systems Programming (3)
CMPT 210 - Probability and Computing (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)
MACM 101 - Discrete Mathematics I (3)
~~MACM 201 - Discrete Mathematics II (3)~~

[…]

Upper Division Requirements

Students complete all of

BUS 312 - Introduction to Finance (3)
BUS 343 - Introduction to Marketing (3)
BUS 361 - Project Management (3)
BUS 468 - Managing Information Technology for Business Value (3) ^^
BUS 478 - Strategy (3) ^
~~CMPT 300 - Operating Systems I (3)~~
CMPT 307 - Data Structures and Algorithms (3)
CMPT 354 - Database Systems I (3) ^^

[…]

and ~~15~~ **18** additional upper division CMPT units~~, excluding CMPT 301~~. At least one of the courses must be at the 400 division or above.

[…]

Degree Choice

[…]

To be eligible for a bachelor of science degree, offered by the Faculty of Applied Sciences, students complete all of the requirements listed above and two additional courses: MACM 316 and a course from the School of Computing Science's table I, II, or III ~~(excluding CMPT 301)~~.

Table I – Computing Science Concentrations

[…]

COMPUTING SYSTEMS
~~CMPT 300 - Operating Systems I (3)~~
CMPT 303 – Operating Systems (3)
CMPT 305 - Computer Simulation and Modelling (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 379 - Principles of Compiler Design (3)
CMPT 403 - System Security and Privacy (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)
CMPT 450 - Computer Architecture (3)
CMPT 471 - Networking II (3)
CMPT 479 - Special Topics in Computing Systems (3)
CMPT 499 - Special Topics in Computer Hardware (3)

[…]

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective. Correct internal transfer list to include CMPT 210 as an option or MACM 201 in calculating the CRGPA.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Computing Science and Linguistics Joint Major BACHELOR OF ARTS OR BACHELOR OF SCIENCE

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.**

[…] BACHELOR OF ARTS OR BACHELOR OF SCIENCE […] Internal Transfer […] Simon Fraser University students applying for School of Computing Science admission are selected on the basis of an admission Computing Related Grade Point Average (CRGPA) and Cumulative Grade Point Average (CGPA). The CRGPA is computed from all courses the student has taken from the following: (CMPT 120, 128 or 130), (CMPT 125, 129 or 135), CMPT 225, (CMPT 275 or 276), CMPT 295, **CMPT 201**, ~~CMPT 300,~~ CMPT 307, MACM 101, (**CMPT 210 or** MACM 201), MACM 316. Applicants must have completed at least one MACM course and at least two CMPT courses from this list before applying. At least two courses used in the CRGPA calculation must have been taken at SFU. […]

Lower Division Requirements

[…]

Computing Science Requirements
[…]
and all of

CMPT 105W - Social Issues and Communication Strategies in Computing Science (3)
CMPT 201 – Systems Programming (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)
MACM 101 - Discrete Mathematics I (3)

[…]

Upper Division Requirements
Computing Science Requirements
Students complete at least 24 units, including all of

~~CMPT 300 - Operating Systems I (3)~~
CMPT 307 - Data Structures and Algorithms (3)
CMPT 310 - Introduction to Artificial Intelligence (3)
CMPT 413 - Computational Linguistics (3)

and four courses chosen from four distinct concentration areas as listed in Table I. CMPT 308 and 379 are recommended.

Table I – Computing Science Concentrations

[…]

COMPUTING SYSTEMS
~~CMPT 300 - Operating Systems I (3)~~
CMPT 303 – Operating Systems (3)
CMPT 305 - Computer Simulation and Modelling (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 379 - Principles of Compiler Design (3)
CMPT 403 - System Security and Privacy (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)

CMPT 450 - Computer Architecture (3)
CMPT 471 - Networking II (3)
CMPT 479 - Special Topics in Computing Systems (3)
CMPT 499 - Special Topics in Computer Hardware (3)

[…]

Name of Program or Name of Faculty School of Computing Science
Rationale for change: The current CMPT 300 combines two general areas, systems programming and operating systems. We are now splitting CMPT 300 into two courses, CMPT 201 (a new course being proposed) and CMPT 303 (a new, more advanced Operating Systems course), in order to delve deeper into those two areas separately. CMPT 201 will replace CMPT 300 as a required course. CMPT 303 will be an elective.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Software Systems Major

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.**

Lower Division Requirements

Students must complete the courses listed below. It is suggested that students complete a recommended schedule of courses within the first two years.

Students complete one of

CMPT 105W - Social Issues and Communication Strategies in Computing Science (3)
ENSC 105W - Process, Form, and Convention in Professional Genres (3)
MSE 101W - Process, Form, and Convention in Professional Genres (3)
SEE 101W - Process, Form and Convention in Professional Genres (3)

and all of

CMPT 130 - Introduction to Computer Programming I (3)
CMPT 135 - Introduction to Computer Programming II (3)
CMPT 201 – Systems Programming (3)
CMPT 210 - Probability and Computing (3)
CMPT 213 - Object Oriented Design in Java (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)
MACM 101 - Discrete Mathematics I (3)

MSE 110 - Mechatronics Design I (3)
STAT 271 - Probability and Statistics for Computing Science (3)
(…)

Systems Requirements

Students complete at least 12 upper division units, among ~~, including~~

~~CMPT 300 - Operating Systems I (3)~~

~~and three of~~

CMPT 303 - Operating Systems (3)
CMPT 354 - Database Systems I (3)
CMPT 371 - Data Communications and Networking (3)
CMPT 372 - Web II - Server-side Development (3)
CMPT 431 - Distributed Systems (3)
CMPT 433 - Embedded Systems (3)
CMPT 454 - Database Systems II (3)
~~CMPT 470 - Web-based Information Systems (3)~~
CMPT 471 - Networking II (3)

[…]

Name of Program or Name of Faculty School of Mechatronic Systems Engineering
Rationale for change: Curriculum review to reduce the number of credits and provide a better experience to students.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Mechatronic Systems Engineering Major Mechatronic Systems Engineering Honours Mechatronic Systems Engineering and Business Double Degree 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.**

Mechatronic Systems Engineering Major

(...)

Program Requirements

Students complete all of

CMPT 130 - Introduction to Computer Programming I (3)
MATH 152 - Calculus II (3)
MATH 232 - Applied Linear Algebra (3)
MATH 251 - Calculus III (3)
~~MATH 260 - Introduction to Ordinary Differential Equations (3)~~
~~MSE 100 - Engineering Graphics and Design (3)~~
MSE 101W - Process, Form, and Convention in Professional Genres (3)
MSE 102 - Applied Science, Technology and Society (3)
MSE 103 – Statics and Dynamics (3)
~~MSE 110 - Mechatronics Design I (3)~~

MSE 112 – Mechatronic Design Studio I (3)
MSE 152 – Digital Computing Fundamentals (3)
MSE 210 - Engineering Measurement and Data Analysis (3)
~~MSE 211 - Computational Methods for Engineers (3)~~
MSE 212 – Mechatronic Design Studio II (3)
MSE 220 - Engineering Materials (3)
MSE 221 - Statics and Strength of Materials (4)
MSE 222 - Kinematics and Dynamics of Rigid Bodies and Mechanisms (4)
MSE 223 - Introduction to Fluid Mechanics (4)
MSE 250 - Electric Circuits (4)
MSE 251 - Electronic Circuits (4)
MSE 252 – Fundamentals of Digital Logic and PLCs (3)
MSE 280 - Linear Systems (3)
MSE 281 – Modelling of Mechatronic Systems (3)
MSE 300 - The Business of Engineering I (3)
MSE 310 - Sensors and Actuators (4)
~~MSE 311 - Introduction to Microelectromechanical Systems (3)~~
MSE 312 - Mechatronics Design II (4) *
MSE 320 - Machine Design (4)
MSE 321 - Engineering Thermodynamics and Heat Transfer (4)
MSE 352 - Digital Logic and Microcontrollers (4)
MSE 353 - Power Electronics and Electric Machinery (4)
~~MSE 380 - Systems Modeling and Simulation (3)~~
MSE 381 - Feedback Control Systems (4) *
MSE 402 - Engineering Ethics, Law, and Professional Practice (2)
MSE 405W - The Business of Engineering II, Entrepreneurship for Engineers (4)
MSE 410 - Capstone Design Technical Project I (3)
MSE 411 - Capstone Design Technical Project II (3)
~~PHYS 140 - Studio Physics - Mechanics and Modern Physics (4)~~
PHYS 141 - Studio Physics - Optics, Electricity and Magnetism (4)

(…)

Mechatronic Systems Engineering Elective Courses

Students must also complete ~~six~~ **four** mechatronic systems engineering elective courses selected from a pre-approved MSE electives list that is available at https://www.sfu.ca/mechatronics/current-students/undergraduate-students/undergraduate-program-requirements/technical-studies-electives.html.

With undergraduate curriculum committee chair permission, students may replace one MSE elective with either a directed study or a special project laboratory course. Special topics courses that have been approved by the undergraduate curriculum committee chair and the director may be counted here.

Agriculture Technology (AgriTech) Concentration

This concentration is for students who wish to specialize in agriculture technology.

Students who choose this concentration will complete all of

BISC 106 - Biological Systems for Engineers (3)
MSE 360 - Introduction to Biosystems Engineering (3)
MSE 460 - Precision AgriTech Engineering (3)
MSE 480 - Manufacturing Systems (3)
SEE 351 - Bioprocess Engineering Systems (3)

~~Students do not need to complete the following from the program requirements~~
~~MSE 311 - Introduction to Microelectromechanical Systems (3)~~

Students also complete ~~three~~ **two** mechatronic systems engineering elective courses selected from a pre-approved MSE electives list instead of ~~six~~ **four** courses.

~~Canadian Engineering Accreditation Board (CEAB) Requirement~~

~~In addition, the Canadian Engineering Accreditation Board (CEAB) requires that one complementary studies elective in the MSE curriculum must be in the Central Issue, Methodology, and Thought Process category.~~

(…)

Mechatronic Systems Engineering Honours

(…)

Program Requirements

Students complete all of

CMPT 130 - Introduction to Computer Programming I (3)
MATH 152 - Calculus II (3)
MATH 232 - Applied Linear Algebra (3)
MATH 251 - Calculus III (3)
~~MATH 260 - Introduction to Ordinary Differential Equations (3)~~
~~MSE 100 - Engineering Graphics and Design (3)~~
MSE 101W - Process, Form, and Convention in Professional Genres (3)
MSE 102 - Applied Science, Technology and Society (3)

MSE 103 – Statics and Dynamics (3)
~~MSE 110 - Mechatronics Design I (3)~~
MSE 112 – Mechatronic Design Studio I (3)
MSE 152 – Digital Computing Fundamentals (3)
MSE 210 – Engineering Measurement and Data Analysis (3)
~~MSE 211 - Computational Methods for Engineers (3)~~
MSE 212 – Mechatronic Design Studio II (3)
MSE 220 - Engineering Materials (3)
MSE 221 - Statics and Strength of Materials (4)
MSE 222 - Kinematics and Dynamics of Rigid Bodies and Mechanisms (4)
MSE 223 - Introduction to Fluid Mechanics (4)
MSE 250 - Electric Circuits (4)
MSE 251 - Electronic Circuits (4)
MSE 252 – Fundamentals of Digital Logic and PLCs (3)
MSE 280 - Linear Systems (3)
MSE 281 – Modelling of Mechatronic Systems (3)
MSE 300 - The Business of Engineering I (3)
MSE 310 - Sensors and Actuators (4)
~~MSE 311 - Introduction to Microelectromechanical Systems (3)~~
MSE 312 - Mechatronics Design II (4) *
MSE 320 - Machine Design (4)
MSE 321 - Engineering Thermodynamics and Heat Transfer (4)
MSE 352 - Digital Logic and Microcontrollers (4)
MSE 353 - Power Electronics and Electric Machinery (4)
~~MSE 380 - Systems Modeling and Simulation (3)~~
MSE 381 - Feedback Control Systems (4) *
MSE 402 - Engineering Ethics, Law, and Professional Practice (2)
MSE 405W - The Business of Engineering II, Entrepreneurship for Engineers (4)
MSE 410 - Capstone Design Technical Project I (3)
MSE 411 - Capstone Design Technical Project II (3)
MSE 498 - Mechatronic Systems Engineering Thesis Proposal (3)
MSE 499 - Mechatronic Systems Engineering Undergraduate Thesis (9)
PHYS 141 - Studio Physics - Optics, Electricity and Magnetism (4)

and one of

MATH 150 - Calculus I with Review (4)
MATH 151 - Calculus I (3)

(…)

Mechatronic Systems Engineering Elective Courses

Students must also complete ~~six~~ **four** mechatronic systems engineering elective courses selected from a pre-approved MSE electives list that is available at https://www.sfu.ca/mechatronics/current-students/undergraduate-students/undergraduate-program-requirements/technical-studies-electives.html.

With undergraduate curriculum committee chair permission, students may replace one MSE elective with either a directed study or a special project laboratory course. Special topics courses that have been approved by the undergraduate curriculum committee chair and the director may be counted here.

(…)

Agriculture Technology (AgriTech) Concentration

This concentration is for students who wish to specialize in agriculture technology.

Students who choose this concentration will complete all of

BISC 106 - Biological Systems for Engineers (3)
MSE 360 - Introduction to Biosystems Engineering (3)
MSE 460 - Precision AgriTech Engineering (3)
MSE 480 - Manufacturing Systems (3)
SEE 351 - Bioprocess Engineering Systems (3)

~~Students do not need to complete the following from the program requirements~~

~~MSE 311 - Introduction to Microelectromechanical Systems (3)~~

Students also complete ~~four~~ **two** mechatronic systems engineering elective courses selected from a pre-approved MSE electives list instead of ~~six~~ **four** courses.

~~Canadian Engineering Accreditation Board (CEAB) Requirement~~

~~In addition, the Canadian Engineering Accreditation Board (CEAB) requires that one complementary studies elective in the MSE curriculum must be in the Central Issue, Methodology, and Thought Process category.~~

(…)

Mechatronic Systems Engineering and Business Double Degree Program

(…)

Program Requirements

Students complete all of

BUS 232 - Business Statistics (3)
BUS 251 - Financial Accounting I (3)
BUS 254 - Managerial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)
BUS 312 - Introduction to Finance (3)
BUS 343 - Introduction to Marketing (3)
BUS 360W - Business Communication (4) †
BUS 381 - Introduction to Human Resource Management (3)
BUS 393 - Commercial Law (3)
BUS 478 - Strategy (3) **
CHEM 120 - General Chemistry I (3)
CMPT 130 - Introduction to Computer Programming I (3)
MATH 151 - Calculus I (3)
MATH 152 - Calculus II (3)
MATH 232 - Applied Linear Algebra (3)
MATH 251 - Calculus III (3)
~~MATH 260 - Introduction to Ordinary Differential Equations (3)~~
~~MSE 100 - Engineering Graphics and Design (3)~~
MSE 101W - Process, Form, and Convention in Professional Genres (3)
MSE 102 - Applied Science, Technology and Society (3)
MSE 103 – Statics and Dynamics (3)
~~MSE 110 - Mechatronics Design I (3)~~
MSE 112 – Mechatronic Design Studio I (3)
MSE 152 – Digital Computing Fundamentals (3)
MSE 210 - Engineering Measurement and Data Analysis (3)
~~MSE 211 - Computational Methods for Engineers (3)~~
MSE 212 – Mechatronic Design Studio II (3)
MSE 220 - Engineering Materials (3)
MSE 221 - Statics and Strength of Materials (4)
MSE 222 - Kinematics and Dynamics of Rigid Bodies and Mechanisms (4)
MSE 223 - Introduction to Fluid Mechanics (4)
MSE 250 - Electric Circuits (4)
MSE 251 - Electronic Circuits (4)
MSE 252 – Fundamentals of Digital Logic and PLCs (3)
MSE 280 - Linear Systems (3)
MSE 281 – Modelling of Mechatronic Systems (3)
MSE 310 - Sensors and Actuators (4)
~~MSE 311 - Introduction to Microelectromechanical Systems (3)~~
MSE 312 - Mechatronics Design II (4) *
MSE 320 - Machine Design (4)

MSE 321 - Engineering Thermodynamics and Heat Transfer (4)
MSE 352 - Digital Logic and Microcontrollers (4)
MSE 353 - Power Electronics and Electric Machinery (4)
~~MSE 380 - Systems Modeling and Simulation (3)~~
MSE 381 - Feedback Control Systems (4) *
MSE 402 - Engineering Ethics, Law, and Professional Practice (2)
MSE 410 - Capstone Design Technical Project I (3)
MSE 411 - Capstone Design Technical Project II (3)
~~PHYS 140 - Studio Physics - Mechanics and Modern Physics (4)~~
PHYS 141 - Studio Physics - Optics, Electricity and Magnetism (4)

(…)

Agriculture Technology (AgriTech) Concentration

This concentration is for students who wish to specialize in agriculture technology.

Students who choose this concentration will complete all of

BISC 106 - Biological Systems for Engineers (3)
MSE 360 - Introduction to Biosystems Engineering (3)
MSE 460 - Precision AgriTech Engineering (3)
MSE 480 - Manufacturing Systems (3)
SEE 351 - Bioprocess Engineering Systems (3)

~~Students do not need to complete the following from the program requirements~~

~~MSE 311 - Introduction to Microelectromechanical Systems (3)~~

Students also complete ~~three~~ **two** mechatronic systems engineering elective courses selected from a pre-approved MSE electives list instead of ~~six~~ **four** courses.

(…)

Mechatronic Systems Engineering Elective Courses

Students must also complete ~~six~~ **four** mechatronic systems engineering elective courses selected from a pre-approved MSE electives list that is available at https://www.sfu.ca/mechatronics/current-students/undergraduate-students/undergraduate-program-requirements/technical-studies-electives.html.

With undergraduate curriculum committee chair permission, students may replace one MSE elective with either a directed study or a special project laboratory course. Special

topics courses that have been approved by the undergraduate curriculum committee chair and the director may be counted here.

Elective Course Requirements

In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.

(…)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

PROGRAM MODIFICATION TEMPLATE

Name of Program or Name of Faculty Resource and Environmental Management Major- Faculty of Environment
Rationale for change: The necessary program change is to replace CMNS 349 with CMNS 311 wherever we have CMNS 349 in our programs. CMNS 349 does not exist anymore and we have been advised by the School of Communication that CMNS 311 is the replacement.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Resource and Environmental Management Major

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

Management Stream

[…]

Communication and Conflict Resolution

Choose one of

CMNS 349 - Environment, Media and Communication (4)
~~CMNS 311 - Topics in Communication and Social Justice (4)~~
PLAN 443 - Public Engagement, Mediation and Conflict Resolution in Planning (4)
REM 320W - Ethics and the Environment (3)
REM 452 - Environmental Education (8) or EDUC 452 - Environmental Education (8)
SD 481 - Global Sustainability Governance and Action (4)

[…]

Name of Program or Name of Faculty Resource and Environmental Management Honours - Faculty of Environment
Rationale for change: The necessary program change is to replace CMNS 349 with CMNS 311 wherever we have CMNS 349 in our programs. CMNS 349 does not exist anymore and we have been advised by the School of Communication that CMNS 311 is the replacement.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Resource and Environmental Management 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 Requirements

[...]

Communication and Conflict Resolution

Choose one of

~~CMNS 349 - Environment, Media and Communication (4)~~
CMNS 311 - Topics in Communication and Social Justice (4)
PLAN 443 - Public Engagement, Mediation and Conflict Resolution in Planning (4)
REM 320W - Ethics and the Environment (3)
REM 452 - Environmental Education (8) or EDUC 452 - Environmental Education (8)
SD 481 - Global Sustainability Governance and Action (4)

[...]

Name of Program or Name of Faculty Sustainable Development Minor - Faculty of Environment
Rationale for change: The necessary program change is to replace CMNS 349 with CMNS 311 wherever we have CMNS 349 in our programs. CMNS 349 does not exist anymore and we have been advised by the School of Communication that CMNS 311 is the replacement.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Sustainable Development 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

[…]

Complete two of*
ARCH 365 - Archaeological Perspectives on Human Ecology (3)
ARCH 389 - Ethnoecology (3)
~~CMNS 349 - Environment, Media and Communication (4)~~
CMNS 311 - Topics in Communication and Social Justice (4)
GEOG 321 - Geographies of Global Capitalism (4)
GEOG 327 - Geography of Tourism (4)
GEOG 363 - Urban Planning and Policy (4)
GEOG 364 - Cities and Crisis (4)
GEOG 377 - Environmental History (4) or HIST 377 - Environmental History (4)
GEOG 389W - Nature and Society (4)
HSCI 308 - Sickness and Wealth: Health in Global Perspective (3)
HSCI 340 - Social Determinants of Health (3)
HUM 325 - The Humanities and the Natural World (4)
IS 307 - International Ethics: Poverty, Environmental Change, & War (4)
IS 358 - Development, Aid and Difference in Historical Perspective (4)
IS 373 - Global Environmental Politics (4)
LBST 311 - Labour and the Environment (3)
PLAN 300 – Planning Methods and Analysis (4)

POL 342 - Developing Countries in Global Politics (4)
POL 346 - International Organization (4)
PSYC 366 - Psychology and Environmental Sustainability (3)
REM 311 - Applied Population Ecology (3)
REM 350 - Energy Management for a Sustainable Climate and Society (4)
REM 355 - Sustainable Transportation for a Zero-Emissions World (3)
REM 356W - Environmental Policy (3)
REM 357 - Planning for Sustainable Food Systems (3)
SA 302W - Global Problems and the Culture of Capitalism (SA) (4)
SA 326 - Food, Ecology and Social Thought (S) (4)
SA 328 - States, Cultures and Global Transitions (SA) (4)
SA 371 - The Environment and Society (SA) (4)

[…]

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

PROGRAM MODIFICATION TEMPLATE

Name of Program or Name of Faculty Molecular Biology and Biochemistry Concentration in Infection and Immunity
Rationale for change: A new course was recently developed that is a good fit for the Concentration
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Molecular Biology and Biochemistry Major Molecular Biology and Biochemistry 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.**

Concentration in Infection and Immunity
(...)

and two of

MBB 427 - Immune Responses in Health and Disease (3)
MBB 445 - ~~Advanced Microbial Pathogenesis (3)~~ **Infectious Disease Mechanisms (3)**
MBB 448- Cancer Immunology
MBB 478 - Seminar in Molecular Epidemiology of Infectious Diseases (3)

and a minimum of four courses chosen from the following list, two of which must be MBB courses. There is no upper limit on the number of courses that can be completed from this list but students will only receive credit for each course once.

(...)
MBB 445 - ~~Advanced Microbial Pathogenesis (3)~~ **Infectious Disease Mechanisms (3)**
MBB 446 - The Molecular Biology of Cancer (3)
MBB 447 - Stem Cells - Current Trends (3)
MBB 448- Cancer Immunology
(...)

Name of Program or Name of Faculty Statistics major, Faculty of Science
Rationale for change: STAT 260 and STAT 360 are being changed from 2-unit courses to 3-unit courses. STAT 261 and STAT 361 are also being deleted. These changes need to be reflected in the program requirements for the Statistics major.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Statistics Major

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.**

Lower Division Requirements

Students complete the following courses:

Both of

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

and one of

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

and one of

MATH 152 - Calculus II (3)
MATH 155 - Mathematics for the Life Sciences II (3)
MATH 158 - Calculus II for the Social Sciences (3)

and

STAT 180 - Career Development Seminar for Statistics and Actuarial Science (1)

and one of

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

and all of

MATH 251 - Calculus III (3)
STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~
STAT 270 - Introduction to Probability and Statistics (3)
STAT 285 - Intermediate Probability and Statistics (3)

* Students are strongly encouraged to complete this requirement in their first year. Students with prior computing experience may be able to challenge CMPT 120.

** Recommended.

Upper Division Requirements

Students complete all of

STAT 300W - Statistics Communication (3)
STAT 330 - Introduction to Mathematical Statistics (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 350 - Linear Models in Applied Statistics (3)

and 12 units in upper division STAT courses from Lists A and B (including a minimum of two courses from List A)

and nine units in additional upper division ACMA, MACM, MATH or STAT courses from Lists A and B. STAT courses (STAT 360 ~~and STAT 361~~ in particular) and MACM 316 are recommended.

List A

STAT 380 - Introduction to Stochastic Processes (3)
STAT 390 - Selected Topics in Probability and Statistics (3)
STAT 410 - Statistical Analysis of Sample Surveys (3)

STAT 430 - Statistical Design and Analysis of Experiments (3)
STAT 440 - Learning from Big Data (3)
STAT 450 - Statistical Theory (3)
STAT 460 - Bayesian Statistics (3)
STAT 490 - Selected Topics in Probability and Statistics (3)
STAT 495 - Directed Studies in Probability and Statistics (3)

List B

STAT 360 - Advanced R for Data Science (~~2~~**3**)
~~STAT 361 - Laboratory for Advanced R for Data Science (1)~~
STAT 445 - Applied Multivariate Analysis (3)
STAT 452 - Statistical Learning and Prediction (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

Name of Program or Name of Faculty Statistics minor, Faculty of Science
Rationale for change: STAT 260 and STAT 360 are being changed from 2-unit courses to 3-unit courses. STAT 261, STAT 361, and STAT 311 are also being deleted. These changes need to be reflected in the program requirements for the Statistics minor.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Statistics 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.**

Lower Division Requirements

Students complete one of

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

and one of

MATH 152 - Calculus II (3)
MATH 155 - Mathematics for the Life Sciences II (3)
MATH 158 - Calculus II for the Social Sciences (3)
MATH 232 - Applied Linear Algebra (3)
MATH 240 - Algebra I: Linear Algebra (3)

and one of

BUS 232 - Business Statistics (3)
ECON 233 - Introduction to Economic Data and Statistics (3)
STAT 201 - Statistics for the Life Sciences (3)

STAT 203 - Introduction to Statistics for the Social Sciences (3)
STAT 205 - Introduction to Statistics (3)
STAT 270 - Introduction to Probability and Statistics (3)

and ~~all of~~

STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~

Upper Division Requirements

Students complete a total of 15 units, including exactly one of

ECON 333 - Statistical Analysis of Economic Data (4)
STAT 302 - Analysis of Experimental and Observational Data (3)
STAT 305 - Introduction to Biostatistical Methods for Health Sciences (3)
STAT 350 - Linear Models in Applied Statistics (3)

A minimum of 11 of the 15 upper division units must be completed using STAT courses other than STAT 310~~, STAT 311,~~ and STAT 320. The remaining 4 units may be substituted with upper division non-STAT units that focus on statistical inference, study design, or quantitative reasoning, such as BUS 336. The eligibility of other non-STAT courses will be at the discretion of departmental advisors. Recommended STAT courses are listed below.

STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 360 - Advanced R for Data Science (~~2~~**3**)
~~STAT 361 - Laboratory for Advanced R for Data Science (1)~~
STAT 403 - Intermediate Sampling and Experimental Design (3)
STAT 445 - Applied Multivariate Analysis (3)
STAT 452 - Statistical Learning and Prediction (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

Name of Program or Name of Faculty Statistics honours, Faculty of Science
Rationale for change: STAT 260 and STAT 360 are being changed from 2-unit courses to 3-unit courses. STAT 261 and STAT 361 are also being deleted. These changes need to be reflected in the program requirements for the Statistics honours.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Statistics 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.**

Lower Division Requirements Students complete the following courses: Both of CMPT 120 - Introduction to Computing Science and Programming I (3) * CMPT 125 - Introduction to Computing Science and Programming II (3) and one of MATH 150 - Calculus I with Review (4) MATH 151 - Calculus I (3) MATH 154 - Mathematics for the Life Sciences I (3) MATH 157 - Calculus I for the Social Sciences (3) and one of MATH 152 - Calculus II (3) MATH 155 - Mathematics for the Life Sciences II (3) MATH 158 - Calculus II for the Social Sciences (3)

and

STAT 180 - Career Development Seminar for Statistics and Actuarial Science (1)

and one of

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

and all of

MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)
STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~
STAT 270 - Introduction to Probability and Statistics (3)
STAT 285 - Intermediate Probability and Statistics (3)

* Students are strongly encouraged to complete this requirement in their first year. Students with prior computing experience may be able to challenge CMPT 120.

** Recommended.

Upper Division Requirements

Students complete all of

MATH 320 - Introduction to Analysis II (3)
MATH 322 - Complex Variables (3)
STAT 300W - Statistics Communication (3)
STAT 330 - Introduction to Mathematical Statistics (3)
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 410 - Statistical Analysis of Sample Surveys (3)
STAT 430 - Statistical Design and Analysis of Experiments (3)
STAT 450 - Statistical Theory (3)
STAT 460 - Bayesian Statistics (3)
STAT 475 - Applied Discrete Data Analysis (3)

and nine units in additional upper division ACMA, MACM, MATH or STAT courses from List A below. STAT courses (STAT 360 ~~and STAT 361~~ in particular) and MACM 316 are recommended.

List A

STAT 360 - Advanced R for Data Science (~~2~~**3**)
~~STAT 361 - Laboratory for Advanced R for Data Science (1)~~
STAT 390 - Selected Topics in Probability and Statistics (3)
STAT 440 - Learning from Big Data (3)
STAT 445 - Applied Multivariate Analysis (3)
STAT 452 - Statistical Learning and Prediction (3)
STAT 485 - Applied Time Series Analysis (3)
STAT 490 - Selected Topics in Probability and Statistics (3)
STAT 495 - Directed Studies in Probability and Statistics (3)

Name of Program or Name of Faculty Actuarial Science major, Faculty of Science
Rationale for change: STAT 260 and STAT 360 are being changed from 2-unit courses to 3-unit courses. STAT 261 is also being deleted. These changes need to be reflected in the program requirements for the Actuarial Science major.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Actuarial Science Major

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.**

Lower Division Requirements

Students complete all of

ACMA 101 - Introduction to Insurance (3)
ACMA 201 - Interest Theory and Applications (3)
BUS 251 - Financial Accounting I (3)
BUS 254 - Managerial Accounting I (3)
CMPT 120 - Introduction to Computing Science and Programming I (3)
ECON 103 - Principles of Microeconomics (4)
ECON 105 - Principles of Macroeconomics (4)
MATH 152 - Calculus II (3)
MATH 251 - Calculus III (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~
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) *

and one of

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

and two ENGL or PHIL courses.

* Recommended

Upper Division Requirements

Students complete the following courses

all of

ACMA 301 - Long-Term Actuarial Mathematics I (3)
ACMA 340 - Financial Economics for Actuaries (3)
ACMA 355 - Loss Models I (3)
ACMA 401 - Long-Term Actuarial Mathematics II (3)
ACMA 455 - Loss Models II (3)
STAT 330 - Introduction to Mathematical Statistics (3)
STAT 350 - Linear Models in Applied Statistics (3)
STAT 452 - Statistical Learning and Prediction (3)

and one of

ACMA 465 - Demography and Mortality Models (3)
ACMA 470 - Property and Casualty Insurance (3)
ACMA 475 - Theory of Pension (3)

and three of

ACMA 360W - Actuarial Communication (3)
ACMA 395 - Special Topics in Actuarial Science (3)
ACMA 490 - Selected Topics in Actuarial Science (3)
BUS 312 - Introduction to Finance (3)
BUS 315 - Investments (3)
ECON 302 - Microeconomic Theory II: Strategic Behavior (4)
ECON 305 - Intermediate Macroeconomic Theory (4)
MACM 316 - Numerical Analysis I (3)
MATH 309 - Continuous Optimization (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 360 - Advanced R for Data Science (~~23~~**3**)
STAT 380 - Introduction to Stochastic Processes (3)

STAT 440 - Learning from Big Data (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)

Name of Program or Name of Faculty Actuarial Science honours, Faculty of Science
Rationale for change: STAT 260 and STAT 360 are being changed from 2-unit courses to 3-unit courses. STAT 261 is also being deleted. These changes need to be reflected in the program requirements for the Actuarial Science honours.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Actuarial Science 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.**

Lower Division Requirements

Students complete all of

ACMA 101 - Introduction to Insurance (3)
ACMA 201 - Interest Theory and Applications (3)
BUS 251 - Financial Accounting I (3)
BUS 254 - Managerial Accounting I (3)
CMPT 120 - Introduction to Computing Science and Programming I (3)
ECON 103 - Principles of Microeconomics (4)
ECON 105 - Principles of Macroeconomics (4)
MATH 152 - Calculus II (3)
MATH 251 - Calculus III (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~
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) *

and one of

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

and two ENGL or PHIL courses.

* Recommended

Upper Division Requirements

Students complete the following courses

all of

ACMA 301 - Long-Term Actuarial Mathematics I (3)
ACMA 340 - Financial Economics for Actuaries (3)
ACMA 355 - Loss Models I (3)
ACMA 401 - Long-Term Actuarial Mathematics II (3)
ACMA 455 - Loss Models II (3)
STAT 330 - Introduction to Mathematical Statistics (3)
STAT 350 - Linear Models in Applied Statistics (3)
STAT 450 - Statistical Theory (3)
STAT 452 - Statistical Learning and Prediction (3)

and two of

ACMA 465 - Demography and Mortality Models (3)
ACMA 470 - Property and Casualty Insurance (3)
ACMA 475 - Theory of Pension (3)

and two of

ACMA 360W - Actuarial Communication (3)
ACMA 395 - Special Topics in Actuarial Science (3)
ACMA 490 - Selected Topics in Actuarial Science (3)
BUS 312 - Introduction to Finance (3)
BUS 315 - Investments (3)
ECON 302 - Microeconomic Theory II: Strategic Behavior (4)
ECON 305 - Intermediate Macroeconomic Theory (4)
MACM 316 - Numerical Analysis I (3)
MATH 309 - Continuous Optimization (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 360 - Advanced R for Data Science (~~2~~**3**)

STAT 380 - Introduction to Stochastic Processes (3)
STAT 440 - Learning from Big Data (3)
STAT 445 - Applied Multivariate Analysis (3)
STAT 460 - Bayesian Statistics (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

Name of Program or Name of Faculty Data Science major, Faculty of Science
Rationale for change: STAT 260 is being changed from a 2-unit course to a 3-unit course. STAT 261 is also being deleted. These changes need to be reflected in the program requirements for the Data Science major.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Data Science Major

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.**

Lower Division Requirements

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)

Mathematics and Computing Science

Students complete both of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)

Mathematics

Students complete one of

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

and both of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)

and one of

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

Statistics

Students complete ~~all~~ **both** of

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~

and one of

BUS 232 - Business Statistics (3)
STAT 201 - Statistics for the Life Sciences (3)
STAT 203 - Introduction to Statistics for the Social Sciences (3)
STAT 205 - Introduction to Statistics (3)
STAT 270 - Introduction to Probability and Statistics (3)

Name of Program or Name of Faculty Data Science honours, Faculty of Science
Rationale for change: STAT 260 is being changed from a 2-unit course to a 3-unit course. STAT 261 is also being deleted. These changes need to be reflected in the program requirements for the Data Science honours.
Effective term and year: Fall 2024
The following program(s) will be affected by these changes: Data Science 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.**

Mathematics Concentration Requirements

Lower Division Requirements

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 225 - Data Structures and Programming (3)

CMPT 276 - Introduction to Software Engineering (3)

Mathematics and Computing Science

Students complete 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)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)

Mathematics

Students complete one of

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

and all of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)

and one of

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

Statistics

Students complete all of

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~

STAT 270 - Introduction to Probability and Statistics (3)

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Open Concentration Requirements

Lower Division Requirements

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)

Mathematics and Computing Science

Students complete both of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)

Mathematics

Students complete one of

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

and both of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)

and one of

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

Statistics

Students complete ~~all~~ **both** of

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~

....

Statistics Concentration Requirements

Lower Division Requirements

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

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

CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)

Mathematics and Computing Science

Students complete both of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)

Mathematics

Students complete one of

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

and all of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)
MATH 251 - Calculus III (3)

and one of

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

Statistics

Students complete all of

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (~~2~~**3**)
~~STAT 261 - Laboratory for Introductory R for Data Science (1)~~
STAT 270 - Introduction to Probability and Statistics (3)

STAT 285 - Intermediate Probability and Statistics (3)

*Recommended