Department of Mathematics and Statistics

Summary of Degree Requirements BA and BA (Hons)

The following is *not* intended to be a complete list of the many requirements of which you should be aware. For that, see the main York Calendar and/or an advisor. Moreover, the regulations that apply to you vary according to the year you entered York.

All students must fulfill the following requirements:

General Education Requirements: Pre Fall 2009 C Faculty of Arts

1000-level course (6 credits) in NATS or BIOL, CHEM, EATS or PHYS. 9 credit 1000-level HUMA Foundations course, plus a 9 credit 2000-level SOSC Foundations course (or 2000-level HUMA and 1000-level SOSC). (The requirement is different for students who entered York before 1997.)

General Education Requirements: Admitted FW 2009 and later

Students in the BA, BA Honours and iBA Honours programs must take a total of 24 credits from the following areas: Humanities, Modes of Reasoning, Natural Science, Social Science. Of these 24 credits, students must complete the following minimum requirements: at least six credits from Humanities, Natural Science and Social Science (with no more than nine credits in each counting towards the general education requirement).

Elective Courses:

All students majoring in a program in this department must take at least 18 credits[1] *outside the department* which are *not required* in their programs. (E.g., EECS 1560 is *not* an elective in the Applied Mathematics BA program.)

Degree Program Selection:

Each student must choose a departmental program (see the following three pages and also the section AProgramge near the front of this minicalendar), in which to complete one of the following degrees:

Specialized Honours Program   Honours Double Major[2] Program   Honours Major Program
Honours Major/Minor[3] Program   Bachelor Program

AResidence@ Requirement[4], Course Requirements:

Bachelor Programs:	At least 90 credits must be completed.
	30 must be from York University.
	A*Major@ requirement:* At least half of the required Major credits must be Ain-Faculty@.
	At least 18 must be in courses at the 3000 level or higher. 12 of these 18 must be in the Major.

Honours Degrees:	At least 120 credits must be completed.
	30 must be from York University.
	A*Major@ requirement:* At least half of each Major=s or Minor=s required credits must be Ain-Faculty@.
	At least 36 credits must be at the 3000 level or higher. 18 of these must be at the 4000 level (of which 12 must be in the Major).

GPA Requirements:

Bachelor Programs: A credit-weighted grade-point average (c.w.g.p.a.) of at least 4.0, over all courses taken, is required to graduate. At most 12 credits may be taken beyond the required 90, to raise the g.p.a. above 4.0 (and they must be above the 1000 level).

Honours Programs: An overall cumulative c.w.g.p.a. of at least 5.0 must be maintained.

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[1] Not applicable to Honours Double Major or Honours Major/Minor candidates, unless both subjects are offered by this department (Mathematics, Applied Mathematics, Statistics, Mathematics for Education).

[2] Choose two different Honours programs (e.g., Mathematics and Economics, or Mathematics and Statistics).

[3] Choose one Honours Major and a distinct Honours Minor.

[4] Requirements that a certain number of your courses must Alive@ in your Faculty and/or department.

Summary of Degree Requirements BSc and BSc (Hons)

Degree Program Selection: Each student must choose a departmental program (see subsequent pages and also the section ΑPrograms@ near the front of this minicalendar), in which to complete one of the following degrees: Specialized Honours Program; Honours Double Major.**1** Program; Bachelor Program; Honours Major/Minor Program; and, Honours Major Program

The following is *not* intended to be a complete list of the many requirements of which you should be aware. For that, see the main York Calendar.

Degree Option/Requirement	Minimum Credit Requirement
A. General Education Requirements	
Non-science Requirement	12 credits in human enquiry outside of science disciplines. See the Non-Science Requirement section of the relevant York University Calendar for details.
Mathematics	6 credits at 1000 level; satisfied within the major or minor requirements in all Mathematics and Statistics programs.
Computer Science	3 credits at 1000 level; satisfied by program requirements except Minor in Mathematics and Minor in Statistics.
Foundational Science	6 credits from SC/BIOL 1000 3.00, SC/BIOL 1001 3.00 (or SC/BIOL 1010 6.00), SC/CHEM 1000 3.00, SC/CHEM 1001 3.00, SC/PHYS 1410 6.00 or SC/PHYS 1010 6.00.
B. Major or Minor Requirements	
	See relevant program checklist on subsequent pages.
C. Science Breadth Requirement Outside the Major Program	
90 credit BSC (Bachelor) degree	24 credits in science disciplines outside the major, of which 3 credits must be at the 2000 level or above, which may include: ≅ science credits in the General Education requirements that are not in the major; and ≅ science credits required by the major that are not in the major discipline. Check program specification in the relevant York University Calendar for guidance.
120 credit Specialized Honours BSc and Honours BSc degrees *Not applicable to double major and major/minor programs, if the second major or the minor is another science discipline.*	24 credits in science disciplines outside the major, of which 3 credits must be at the 2000 level or above, which may include: ≅ science credits in the General Education requirements that are not in the major; and; ≅ science credits required by the major that are not in the major discipline. Check program specification in the relevant York University Calendar for guidance.
D. Upper Level Requirements Not Implemented Within the Program Specification	
90 credits BSc (Bachelor) degree	Minimum of 18 credits must be at the 3000 level or above.
120 credit Specialized Honours BSc and Honours BSc degrees	Minimum of 42 credits must be at the 3000 level or above.
E. Elective Requirements	
90 credit BSc (Bachelor) degree	Additional elective credits, as required, for an overall total of 90 credits.
120 credit Specialized Honours BSc and Honours BSc degrees	Additional elective credits, as required, for an overall total of 120 credits.
F. Standing Requirements	
90 credit BSc (Bachelor) degree	A minimum overall grade point average of 4.00 (c) is required in order to be eligible to graduate.
120 credit Specialized Honours BSc and Honours BSc degrees	To graduate in an Honours program requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade point average of 5.00 8+) over all courses completed, subject to the following exception. In addition, a minimum cumulative credit-weighted grade point average of 5.00 8+) over all biology courses completed is required to graduate in an Honours Double Major program where biology is the other major.
Residency Requirement	
	A minimum of 30 courses credits and at least half (50 percent) of the course credits required in each undergraduate degree program major/minor must be taken at York University.

1 Choose two different Honours Majors (e.g., Mathematics and Physics, or Applied Mathematics and Statistics).

Department of Mathematics and Statistics

Specialized Honours BA Major in Actuarial Science (120 credits)

Mathematics/Statistics Core, ECON 1000 3.00, ECON 1010 3.00, AP/MODR 1770 6.00, AP/WRIT 1702 6.00, LE/EECS 1560 3.00, MATH 2001 3.00, MATH 2131 3.00 , MATH 2270 3.00, MATH 2280 3.00, MATH 2281 3.00, ECON 2300 3.00, ECON 2350 3.00, MATH 3131 3.00, MATH 3132 3.00, MATH 3280 3.00, MATH 3281 3.00, MATH 3330 3.00, MATH 4430 3.00, MATH 4130B 3.00, MATH 4143 3.00, MATH 4280 3.00, MATH 4281 3.00. Plus: 3 additional credits selected from MATH courses without second digit A5@ at the 3000 level or higher, and 3 additional credits selected from MATH courses without second digit A5@ at the 4000 level.

	Fall Term	Winter Term
Year 1	MATH 1300 3.00 (core) MATH 1021 3.00 (core) MATH 1131 3.00 (core, Exam P of the SoA)	MATH 1310 3.00 (core) MATH 2022 3.00 (core)
Year 1	MATH 1200 3.0 (Year) (core) AP/WRIT 1702 6.00 (GENED) ECON 1000 3.00 (required elective C VEE of the SoA	ECON 1010 3.00 (required elective C VEE of the SoA)
Year 2	MATH 2030 3.00 (core, Exam P of the SoA) MATH 2280 3.00 (Exam FM of the SoA) MATH 2001 3.00 MATH 2310 3.00 (core) ECON 2300 3.00 (required elective, prerequisite to ECON 4400 3.00)	MATH 2131 3.00 (Exam P of the SoA) MATH 2281 3.00 (Exam MFE of the SoA) LE/EECS 1560 3.00 MATH 2270 3.00 ECON 2350 3.00 (required elective, prerequisite)
Year 3	MATH 3131 3.00 (Exam C of the SoA) MATH 3280 3.00 (Exam MLC of the SoA) MATH 3330 3.00 (VEE of the SoA) MATH 4430 3.00 or MATH 4431 3.00 (Exam MLC of the SoA) ECON 4400 3.00 (required elective, VEE of the SoA)	MATH 3132 3.00 (Exam C of the SoA) MATH 3281 3.00 (Exam MLC of the SoA) ECON 4410 3.00 (required elective, VEE of the SoA)
Year 3	AP/MODR 1770 6.00 (GENED C modes of reasoning)	
Year 4	MATH 4280 3.00 (Exam C of the SoA) MATH 4130B 3.00 (VEE of the SoA) MATH 3 ʒ YZ 3.00	MATH 4281 3.00 (Exam C of the SoA) MATH 4143 3.00 MATH 4 ʒ YZ 3.00
Year 4	**Twelve** additional credits in general education	

AX ʒ Y@ means math courses without second digit A5@.

MATH 3 ʒ YZ 3.00 can be substituted with MATH 4 ʒ YZ 3.00 but not the other way.

SoA means the Society of Actuaries.

VEE refers to the Validation by Educational Experience requirements of the SoA.

GENED should be used to satisfy: 24 credits from the following areas: Humanities, Modes of Reasoning, Natural Science, Social Science. Of these 24 credits, students must complete the following minimum requirements: at least six credits from Humanities, Natural Science and Social Science (with no more than 9 credits in each counting towards the general education requirement).

At least 120 credits must be completed.

At least 36 credits must be at the 3000 level or higher. 18 of these must be at the 4000 level (of which 12 must be in the major).

Specialized Honours BA Major in Actuarial Science (120 credits) (continued)

After completion of the 2nd year, students are advised to sit the Exams P and FM of the SoA and also to approach the program coordinator to enquire about existing internship opportunities.

After completion of the 3rd year, students are advised to sit the Exams MLC and MFE of the SoA and also to approach the program coordinator to enquire about existing internship opportunities.

Upon graduation, students are advised to sit the Exam C of the SoA and also to apply for exemptions from the VEE requirements given that their marks are at least B in all relevant courses.

Department of Mathematics and Statistics

Honours BA Major, Double Major or Major/Minor in Actuarial Science (120 credits)

Mathematics/Statistics Core, AP/WRIT 1702 6.00, LE/EECS 1560 3.00, MATH 2131 3.00, MATH 2280 3.00, MATH 2281 3.00, MATH 3131 3.00, MATH 3280 3.00, MATH 3281 3.00, MATH 3330 3.00, MATH 4430 3.00, MATH 4130B 3.00, MATH 4280 3.00, MATH 4281 3.00. Plus: 6 additional credits selected from MATH courses without second digit Α 5@ at the 3000 level or higher, and 6 additional credits selected from MATH courses without second digit Α 5@ at the 4000 level.

	Fall Term	Winter Term
Year 1	MATH 1300 3.00 (core) MATH 1021 3.00 (core) MATH 1131 3.00 (core, Exam P of the SoA)	MATH 1310 3.00 (core) MATH 2022 3.00 (core)
	MATH 1200 3.0 (Year) (core) AP/WRIT 1702 6.00 (GENED) ECON 1000 3.00 (suggested elective C VEE of the SoA	ECON 1010 3.00 (elective C VEE of the SoA)
Year 2	MATH 2030 3.00 (core, Exam P of the SoA) MATH 2280 3.00 (Exam FM of the SoA) MATH 2310 3.00 (core) ECON 2310 3.00 (elective, prerequisite)	MATH 2131 3.00 (Exam P of the SoA) MATH 2281 3.00 (Exam MFE of the SoA) LE/EECS 1560 3.00 ECON 2350 3.00 (elective, prerequisite)
	Six additional credits in general education	
Year 3	MATH 3131 3.00 (Exam C of the SoA) MATH 3280 3.00 (Exam MLC of the SoA) MATH 3330 3.00 (VEE of the SoA) MATH 4430 3.00 or MATH 4431 3.00 (Exam MLC of the SoA) ECON 4400 3.00 (elective, VEE of the SoA)	MATH 3281 3.00 (Exam MLC of the SoA) ECON 4410 3.00 (elective, VEE of the SoA)
	Six additional credits in general education, 3 additional elective credits at the 3000 level	
Year 4	MATH 4280 3.00 (Exam C of the SoA) MATH 4130B 3.00 (VEE of the SoA) MATH 3 Ƶ YZ 3.00 MATH 4 Ƶ YZ 3.00	MATH 4281 3.00 (Exam C of the SoA) MATH 3 Ƶ YZ 3.00 MATH 4 Ƶ YZ 3.00
	Six additional credits in general education, 15 additional elective credits of which at least 3 are at the 3000 level	

SoA means the Society of Actuaries.

ΑX Ƶ Y@ means math courses without second digit Α 5@.

MATH 3 Ƶ YZ 3.00 can be substituted with MATH 4 Ƶ YZ 3.00 but not the other way.

VEE refers to the Validation by Educational Experience requirements of the SoA.

GENED should be used to satisfy: 24 credits from the following areas: Humanities, Modes of Reasoning, Natural Science, Social Science. Of these 24 credits, students must complete the following minimum requirements: at least six credits from Humanities, Natural Science and Social Science (with no more than 9 credits in each counting towards the general education requirement).

At least 120 credits must be completed.

At least 36 credits must be at the 3000 level or higher. 18 of these must be at the 4000 level (of which 12 must be in the major).

Honours BA Major, Double Major or Major/Minor in Actuarial Science (120 credits)
(continued)

After completion of the 2nd year, students are advised to sit the Exams P and FM of the SoA and also to approach the program coordinator to enquire about existing internship opportunities.

After completion of the 3rd year, students are advised to sit the Exams MLC and MFE of the SoA and also to approach the program coordinator to enquire about existing internship opportunities.

Upon graduation, students are advised to apply for exemptions from VEE requirements given that they took the suggested elective courses and their marks are at least B in all relevant courses.

Department of Mathematics and Statistics

Certificate in Actuarial Science within a 120 credit Honours Degree

MATH 1300 3.00, MATH 1310 3.00, MATH 1025 3.00, MATH 1131 3.00, LE/EECS 1560 3.00, MATH 2030 3.00, MATH 2131 3.00, MATH 2280 3.00, MATH 2281 3.00, MATH 3280 3.00, MATH 3281 3.00, MATH 4280 3.00, MATH 4281 3.00.

	Fall Term	Winter Term
	MATH 1300 3.00 MATH 1131 3.00 (core, Exam P of the SoA)	MATH 1310 3.00 MATH 1025 3.00
Year 1	Plus additional courses per the students= Honours degree	
	MATH 2030 3.00 (Exam P of the SoA) MATH 2280 3.00 (Exam FM of the SoA) MATH 2310 3.00	MATH 2131 3.00 (Exam P of the SoA) MATH 2281 3.00 (Exam FM of the SoA) LE/EECS 1560 3.00
Year 2	Plus additional courses per the students= Honours degree	
	MATH 3280 3.00 (Exam MLC of the SoA)	MATH 3281 3.00 (Exam MLC of the SoA)
Year 3	Plus additional courses per the students= Honours degree	
	MATH 4280 3.00 (Exam C of the SoA)	MATH 4281 3.00 (Exam C of the SoA)
Year 4	Plus additional courses per the students= Honours degree	

SoA means the Society of Actuaries.

GENED should be used to satisfy: 24 credits from the following areas: Humanities, Modes of Reasoning, Natural Science, Social Science. Of these 24 credits, students must complete the following minimum requirements: at least six credits from Humanities, Natural Science and Social Science (with no more than 9 credits in each counting towards the general education requirement).

At least 120 credits must be completed.

After completion of the 2nd year, students are advised to sit the Exams P and FM of the SoA and also to approach the program coordinator to enquire about existing internship opportunities.

Applied Mathematics BA, BA (Hons), BSc, BSc (Hons) Programs

Important: For a summary of Faculty degree requirements, see page 35 for BA, BA (Hons) and page 36 for BSc, BSc (Hons).

Note: *See also the Αareas of concentration@ listed on page 7, when choosing upper-year courses.*

Mathematics/Statistics Core:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Specialized Honours BA or BSc Major:

Mathematics/Statistics CoreG				EECS 1560 3.0	G	MATH 2001 3.0	G
MATH 2031 1.0[1]	G	MATH 2041 3.0	G	MATH 2270 3.0	G	MATH 3001 3.0	G
MATH 3241 3.0	G	MATH 3242 3.0	G	MATH 3243 1.0[1]	G	MATH 3271 3.0	G
MATH 3260 3.0 *or* MATH 3171 3.0 + MATH 3172 3.0 G				MATH 3410 3.0	G	MATH 4090 3.0	G

9 additional credits selected from MATH courses (without second digit Α5@) at the 4000 level. G

Honours BA or BSc Major, Double Major or Major/Minor:

Mathematics/Statistics CoreG				EECS 1560 3.0	G	MATH 2031 1.0[1]	G
MATH 2041 3.0	G	MATH 2270 3.0	G	MATH 3241 3.0	G	MATH 3243 1.0[1]	G
MATH 3242 3.0 *or* MATH 3260 3.0 *or* MATH 3171 3.0 + MATH 3172 3.0 G				MATH 3271 3.0	G	MATH 4090 3.0	G

9 additional credits selected from MATH courses (without second digit Α5@) at the 4000 level.   G

Honours BA or BSc Minor (with another subject as Major):

MATH 1021 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G	EECS 1560 3.0	G
MATH 2310 3.0	G	6 credits chosen from: MATH 2041 3.0; MATH 2270 3.0; either MATH 2022 3.0 or MATH 2222 3.0. G						

12 additional credits selected from MATH courses (without second digit Α5@) at the 3000 level or higher including at least 6 credits selected from MATH 3090 3.0, MATH 3171 3.0, MATH 3172 3.0, MATH 3241 3.0, MATH 3242 3.0, MATH 3260 3.0, MATH 3271 3.0 or MATH 3410 3.0.   G

Bachelor BA or BSc Program:

Mathematics/Statistics CoreG				EECS 1560 3.0	G	MATH 2031 1.0[1]	G
MATH 2041 3.0	G	MATH 2270 3.0	G	MATH 3241 3.0	G	MATH 3243 1.0[1]	G
MATH 3260 3.0 *or* MATH 3271 3.0 G							

6 additional credits selected from MATH 3090 3.0, MATH 3171 3.0, MATH 3172 3.0, MATH 3242 3.0, MATH 3260 3.0, MATH 3410 3.0, MATH 4090 3.0, MATH 4141 3.0, or MATH 4161 3.0. G

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[1] Both MATH 2031 1.0 and MATH 3243 1.0 are waived from program requirements.

Department of Mathematics and Statistics

Computational Mathematics
Specialized Honours BSc

Important: For a summary of Faculty degree requirements, see page 36.

The only degree currently offered in Computational Mathematics is Specialized Honours BSc. Students must complete the courses in the first box below and the courses in one of the two areas of concentration appearing further down this page.

Mathematics/Statistics Core:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Computational Mathematics Core:

EECS 1020 3.0	G	EECS 1030 3.0	G	EECS 2031 3.0	G	MATH 2031 1.0[2]	G
MATH 2041 3.0	G	MATH 2131 3.0	G	MATH 2270 3.0	G	MATH 3090 3.0	G
MATH 3241 3.0	G	MATH 3242 3.0	G	MATH 3243 1.0[2]	G	MATH 3271 3.0	G
MATH 4090 3.0	G						

Applied and Industrial Mathematics:

		Computational Mathematics Core		
Mathematics/Statistics Core	G	G		
MATH 3171 3.0 + 3172 3.0[1]	G	MATH 4141 3.0	G	MATH 4171 3.0 + 4172 3.0 G

Financial Mathematics

Mathematics/Statistics CoreG				Computational Mathematics Core		
				G		
ECON 1000 3.0	G	ECON 1010 3.0	G	MATH 2280 3.0	G	MATH 2281 3.0
						G
MATH 3330 3.0	G	MATH 4143 3.0	G	MATH 4430 3.0 *or* MATH 4431 3.0	G	

3 additional credits selected from MATH courses (without second digit ₄5₉) at the 4000 level to make the total of such courses at least 12 credits.   G

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[1] This may be replaced by MATH 3170 6.0.
[2] Both MATH 2031 1.0 and MATH 3243 1.0 are waived from program requirements.

International Dual Degree Mathematics Statistics
BSc, BSc (Specialized Hons) Programs[1]

Important: For a summary of Faculty degree requirements, see page 36.

Note: This program requires a *Specified General Education Requirement.* See box at bottom of this page.

Mathematics/Statistics Core:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Specialized Honours Major:

Mathematics/Statistics Core   G

EECS 1530 3.0	G	EECS 1560 3.0	G	PHYS 1410 6.0	G	MATH 2001 3.0	G
MATH 2270 3.0	G	MATH 2320 3.0	G	MATH 3021 3.0 + 3022 3.0	G	MATH 3171 3.0 + 3172 3.0[2]	G
MATH 3241 3.0	G	MATH 3271 3.0	G	MATH 3410 3.0	G		

12 additional credits selected from MATH courses at the 4000 level.   G

Bachelor Program:

Mathematics/Statistics Core   G

EECS 1530 3.0	G	EECS 1560 3.0	G	PHYS 1410 6.0	G	MATH 2001 3.0	G
MATH 2270 3.0	G	MATH 2320 3.0	G	MATH 3021 3.0 + 3022 3.0	G	MATH 3171 3.0 + 3172 3.0**[2]**	G
MATH 3241 3.0	G	MATH 3271 3.0	G	MATH 3410 3.0	G		

In lieu of the Faculty=s General Education Requirement, students of this program MUST take the appropriate courses.

Students whose home university is York University

AP/IT 1000 6.0   G   Any Faculty-approved General Education course 3.0   G

Lingua e Cultura Italiana 3.0 (offered by the University of L=Aquila)   G

Students whose home university is University of L=Aquila

Lingua Inglese 1, 2 (offered by the University of L=Aquila)   G

HUMA 1220 9.0

G

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[1] For an up-to-date list of equivalent courses offered at the University of L=Aquila, contact the Department of Mathematics and Statistics.

[2] This may be replaced by MATH 3170 6.0.

Department of Mathematics and Statistics

Mathematics BA, BA (Hons), BSc, BSc (Hons) Programs

Important: For a summary of Faculty degree requirements, see page 35 for BA, BA (Hons) and page 36 for BSc, BSc (Hons).

Mathematics/Statistics Core[1]:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Specialized Honours BA or BSc Major:

Mathematics/Statistics Core	G			EECS 1560 3.0	G	MATH 2001 3.0	G
MATH 2031 1.0	G	MATH 3001 3.0	G	MATH 3010 3.0	G	MATH 4011 3.0	G
MATH 3021 3.0 and MATH 3022 3.0	G					MATH 4021 3.0	G
MATH 4400 6.0	G						

15 additional credits selected from MATH courses (without second digit A5@). G

Honours BA or BSc Major, Double Major or Major/Minor:

Mathematics/Statistics Core	G			EECS 1560 3.0	G	MATH 2001 3.0	G
MATH 2031 1.0[2]	G	MATH 3001 3.0	G	MATH 3010 3.0	G	MATH 4011 3.0	G
MATH 3021 3.0 and MATH 3022 3.0	G					MATH 4021 3.0	G
						MATH 4400 6.0	G

Honours BA or BSc Minor (with another subject as Major):

MATH 1300 3.0	G	MATH 1310 3.0	G	MATH 1021 3.0	G	MATH 2022 3.0	G
MATH 2310 3.0	G						

3 credits chosen from:
MATH 1019 3.0, MATH 1090 3.0, MATH 1190 3.0, MATH 1200 3.0, MATH 2030 3.0, MATH 2320 3.0   G

12 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher   G

Bachelor BA or BSc Program:

EECS 1560 3.0	G	MATH 1021 3.0[2]	G	MATH 1200 3.0	G	MATH 1300 3.0	G
MATH 1310 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2031 1.0[2]	G
MATH 2310 3.0	G	MATH 3010 3.0	G				

9 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher.   G

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[1] In all Mathematics Honours programs, MATH 1021 3.0 and/or MATH 2022 3.0 may be replaced by other linear algebra courses, but if the grade obtained in any such replacement is below A then one of the following courses must be taken above and beyond the normal Honours requirements: MATH 1019 3.0, MATH 1090 3.0, MATH 1190 3.0 or MATH 2320 3.0.
[2] MATH 2031 1.0 is waived from program requirements.

Mathematical Biology BSc (Hons) Programs

Suggested program:
(Common core listed in bold)

Year 1

Credit value	BSc specified requirements (Honours and Specialized Honours)	
3.0	**MATH 1021**	**Linear Algebra I**
3.0	**MATH 1131**	**Intro to Statistics I**
3.0	**MATH 1200**	**Problems, Conjectures and Proofs**
3.0	**MATH 1300**	**Differential Calculus with Applications**
3.0	**MATH 1310**	**Integral Calculus with Applications**
3.0	CHEM 1000	Chemical Structure
3.0	CHEM 1001	Chemical Dynamics
3.0	BIOL 1000	Biology I
3.0	BIOL 1001	Biology II
3.0	**EECS 1560**	**Computer Science**

Year 2

Credit value	BSc specified requirements (Honours and Specialized Honours)	
3.0	**MATH 2030**	**Elementary Probability**
3.0	**MATH 2022**	**Linear Algebra II**
3.0	MATH 2270	Differential Equations
3.0	MATH 2310	Calculus of Several Variables with Applications
3.0	MATH 2041	Symbolic Comp Lab I
6.0	BIOL at 2000 level or higher	
6.0	Electives at 1000 level or higher from	CHEM 2020 6.0* KINE 2011 3.0 KINE 2031 3.0 PHYS 1010 6.0 PHYS 1410 6.0 ENVS 1000 6.0 * recommended
PLUS		
3.0	Electives at 1000 level or higher	Honours
3.0	MATH 2001	Real Analysis I Specialized Honours

Department of Mathematics and Statistics

Mathematical Biology BSc (Hons) Programs (continued)

Year 3

Credit value	BSc specified requirements (Honours and Specialized Honours)	
9.0	BIOL at 3000 level or higher	
6.0	Electives at 2000 level or higher	CHEM 2020 6.0 HH/KINE 2011 3.0 HH/KINE 2031 3.0 recommended
3.0	MATH 3250	Mathematical Biology
PLUS		
3.0	One of: MATH 3090 MATH 3171 MATH 3241 MATH 3260 MATH 3271	Computational Math Operations Research Numerical Methods I Intro to Graph Theory Partial Diff=l Eqns
9.0	Electives at 2000 level or higher	
OR Specialized Honours below:		
3.0	MATH 3010	Vector Integral Calc
3.0	MATH 3241	Numerical Methods I
3.0	MATH 3410	Complex Variables
3.0	One of: MATH 3050 MATH 3090 MATH 3171 MATH 3242 MATH 3260 MATH 3271	Intro to Geometries Computational Math Operations Research Numerical Methods II Intro to Graph Theory Partial Diff=l Eqns

Year 4

Credit value	BSc specified requirements (Honours and Specialized Honours)	
6.0	MATH 4250	Math Bio Practicum
6.0	One of: MATH 4090 MATH 4171 + MATH 4172 MATH 4271 MATH 4430 MATH 4431	Math Modelling Operation Research II Dynamical Systems Stochastic Processes Probability Models
18.0	Electives at 2000 level or higher	*total credits at 3000 level or higher must be at least 42

Mathematics for Commerce BA and BA (Hons) Programs
(This program will be closed starting Fall 2017)

Mathematics for Commerce may not be taken jointly with another subject in a Double Major honours program. For a summary of Faculty degree requirements, see page 35.[1]

Mathematics/Statistics Core:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Specialized Honours Actuarial Stream:

Mathematics/Statistics CoreG

EECS 1560 3.0	G	MATH 2001 3.0	G	MATH 2031 1.0[4]	G	MATH 2131 3.0	G
MATH 2270 3.0	G	MATH 2280 3.0	G	MATH 2281 3.0	G	MATH 3131 3.0	G
MATH 3132 3.0	G	MATH 3280 3.0	G	MATH 3281 3.0	G	MATH 3330 3.0[2]	G
MATH 4280 3.0	G	MATH 4130B 3.0[2]	G	MATH 4143 3.0	G	MATH 4281 3.0	G
MATH 4430 3.0 *or* MATH 4431 3.0	G						

Honours Actuarial Stream:

Mathematics/Statistics CoreG

EECS 1560 3.0	G	MATH 2031 1.0[4]	G	MATH 2131 3.0	G	MATH 2280 3.0	G
MATH 3131 3.0	G	MATH 3280 3.0 + 3281 3.0GG				MATH 3330 3.0	G
MATH 4280 3.0	G	MATH 4430 3.0 *or* MATH 4431 3.0	G				

6 additional credits selected from MATH courses at the 4000 level.   G

Honours Operations Research Stream:

Mathematics/Statistics CoreG

EECS 1560 3.0	G	MATH 2031 1.0[4]	G	MATH 2131 3.0	G	MATH 3171 3.0 + 3172 3.0[3]	G
MATH 3330 3.0	G	MATH 4170 6.0	G	MATH 4330 3.0 *or* MATH 3430 3.0			

6 additional credits selected from MATH courses at the 4000 level.   G

Honours Minor (with another subject as Major):

EECS 1520 3.0	G	MATH 1550 6.0 *or* (MATH 1530 3.0 + 1540 3.0)	G				
MATH 1021 3.0	G	MATH 1581 3.0	G	MATH 2560 3.0	G	MATH 2570	
MATH 3171 3.0 + 3172 3.0[3]	G	MATH 3330 3.0	G	MATH 3034 3.0 *or* MATH 3430 3.0			
				G			

Bachelor Program:

EECS 1520 3.0	G	EECS 1530 3.0	G	MATH 1550 6.0 *or* (MATH 1530 3.0 + 1540			
MATH 2221 3.0	G	MATH 2222 3.0	G	MATH 2560 3.0	G	MATH 2570	
MATH 1581 3.0 + 2581 3.0GG				MATH 3330 3.0	G	MATH 3170 6.0 + 3172 3.0[3]	G

One of: MATH 4330 3.0 *or* MATH 3430 3.0   G

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[1] In an honours program, three full courses at the 4000 level are required. Students must plan ahead to ensure they have the prerequisites for six *more* credits at the 4000 level, in MATH or another subject.   [2] This course is part of the >Applied Statistics= Validation by Educational Experience (VEE) requirements of the Canadian Institute of Actuaries. In addition to it, students should take the following courses as electives: AP/ECON 1000 3.0, AP/ECON 1010 3.0 for the >Economics= VEE and AP/ECON 2300 3.0,

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AP/ECON 2350 3.0, AP/ECON 4400 3.0, AP/ECON 4410 3.0 for the >Corporate Finance= VEE. To be granted VEE credit from the Canadian Institute of Actuaries, students must achieve a grade of B or higher in each VEE requirement.
[3] This may be replaced by MATH 3170 6.00.   [4] MATH 2031 1.0 is waived from program requirements.

Mathematics for Education BA (Hons), BSc (Hons) Programs

Important: For a summary of Faculty degree requirements, see page 35 for BA, BA (Hons) and page 36 for BSc, BSc (Hons).

Note: This program may be taken as a double major, or as a minor with a program in other Faculties.

Mathematics/Statistics Core:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Specialized Honours BA or BSc Major:

Mathematics/Statistics Core	G	EECS 1560 3.0	G	MATH 2031 1.0[1]	G

3 credits chosen from: MATH 2001 3.0, MATH 2131 3.0, MATH 2270 3.0 *or* MATH 2280 3.0 G

MATH 3050 6.0 *or* MATH 3052 6.0	G	MATH 3090 3.0	G	MATH 4100 3.0	G

MATH 4400 6.0 G

9 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher including 3 credits at the 4000 l

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Honours BA or BSc Major, Double Major or Major/Minor:

Mathematics/Statistics Core	G	EECS 1560 3.0	G	MATH 2031 1.0[1]	G
MATH 3050 6.0 or MATH 3052 6.0	G	MATH 4100 3.0	G		

12 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher including 9 credits at the 4000 level (MATH 4400 6.0 and one of MATH 3090 3.0 or MATH 4090 3.0 recommended). G

Honours BA Minor (with another subject as Major):

3 EECS credits (EECS 1560 3.0 recommended) G

		MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G
MATH 1021 3.0	G						
MATH 1310 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G		

9 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher, with at least 6 credits at the 4000 level, including MATH 4100 3.0 or MATH 4400 6.0. G

3 credits, which may be within the choices above, selected from proof-based courses approved by the director (such as MATH 2001 3.0, MATH 3020 6.0, MATH 3050 6.00 *or* MATH 3052 6.0, MATH 3140 6.0, MATH 3260 3.0, MATH 4160 3.0). G

Honours BSc Minor (with another subject as Major):

3 EECS credits (EECS 1560 3.0 recommended) G

		MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G
MATH 1021 3.0	G						
MATH 1310 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G		

9 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher including MATH 4100 3.0 or MATH 4400 6.0. G

3 credits, which may be within the choices above, selected from proof-based courses approved by the director (such as MATH 2001 3.0, MATH 3020 6.0, MATH 3050 6.0 *or* MATH 3052 6.0, MATH 3140 6.0, MATH 3260 3.0, MATH 4160 3.0). G

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[1] MATH 2031 1.0 is waived from program requirements.

Statistics BA, BA (Hons), BSc and BSc (Hons) Programs

Important: For a summary of Faculty degree requirements, see page 35 for BA, BA (Hons) and page 36 for BSc, BSc (Hons).

Mathematics/Statistics Core:

MATH 1131 3.0	G	MATH 1200 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 1021 3.0	G	MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2310 3.0	G

Specialized Honours BA or BSc Major:

Mathematics/Statistics Core	G			EECS 1560 3.0	G	MATH 2001 3.0	G
MATH 2031 1.0[1]	G	MATH 2131 3.0	G	MATH 3001 3.0	G	MATH 3131 3.0	G
MATH 3132 3.0	G	MATH 3330 3.0	G	MATH 3430 3.0	G	MATH 4330 3.0	G
MATH 4730 3.0	G	MATH 4939 3.0	G				

3 additional credits selected from MATH courses with third digit A3@ at the 4000 level.   G

9 additional credits selected from MATH courses (without second digit A5@).   G

Honours BA or BSc Major, Double Major or Major/Minor:

Mathematics/Statistics Core	G			EECS 1560 3.0	G	MATH 2031 1.0[1]	G
MATH 2131 3.0	G	MATH 3131 3.0	G	MATH 3132 3.0	G	MATH 3330 3.0	G
MATH 3430 3.0	G	MATH 4330 3.0	G	MATH 4730 3.0	G	MATH 4939 3.0	G

3 additional credits selected from MATH courses with third digit A3@ at the 4000 level.   G

Honours BA or BSc Minor (with another subject as Major):

MATH 1021 3.0	G	MATH 1131 3.0	G	MATH 1300 3.0	G	MATH 1310 3.0	G
MATH 2022 3.0	G	MATH 2030 3.0	G	MATH 2131 3.0	G	MATH 3131 3.0	G
MATH 3330 3.0	G	MATH 3430 3.0	G	MATH 4330 3.0	G	MATH 4730 3.0	G

Bachelor BA or BSc Program:

Mathematics/Statistics CoreG

EECS 1560 3.0	G	MATH 2031 1.0[1]	G	MATH 2131 3.0	G	MATH 3131 3.0	G
MATH 3330 3.0	G						

3 additional credits selected from MATH courses with third digit A3@ at the 3000 level or higher.
                          G

3 additional credits selected from MATH courses (without second digit A5@) at the 3000 level or higher.   G

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[1] MATH 2031 1.0 is waived from program requirements.