

MATHEMATICS - PHYSICS AND ASTRONOMY JOINT, B.SC. HONOURS

Degree Requirements

Joint Honours (Including Co-operative Option if Selected)

Course	Title	Hours
Year 1		
MATH 1220	Linear Algebra 1 ¹	3
MATH 1230	Differential Calculus ¹	3
MATH 1232	Integral Calculus (B) ¹	3
MATH 1240	Elementary Discrete Mathematics	3
One of: ²		3
PHYS 1050	Physics 1: Mechanics (B)	
PHYS 1020	General Physics 1 (B+)	
One of:		3
PHYS 1070	Physics 2: Waves and Modern Physics (B) ²	
PHYS 1030	General Physics 2 (B+)	
STAT 1150	Introduction to Statistics and Computing ³	3
COMP 1012	Computer Programming for Scientists and Engineers	3
6 credit hours from the Faculty of Arts, which should include the required "W" course ⁴		6
Hours		30
Year 2		
PHYS 2260 or PHYS 2610	Optics or Circuit Theory and Introductory Electronics	3
PHYS 2386	Introduction to Quantum Mechanics and Special Relativity	3
PHYS 2600	Electromagnetic Field Theory	3
PHYS 2650	Classical Mechanics 1 ⁵	3
3 credit hours of Physics ⁶		3
MATH 2020	Algebra 1	3
MATH 2080	Introduction to Analysis	3
MATH 2090	Linear Algebra 2	3
MATH 2150	Multivariable Calculus	3
MATH 2180	Real Analysis 1	3
Hours		30
Year 3		
MATH 3340	Complex Analysis 1	3
MATH 3440	Ordinary Differential Equations	3
MATH 3460	Partial Differential Equations	3
MATH 3474	Real Analysis 2	3
MATH 3476	Real Analysis 3	3
PHYS 3670	Classical Thermodynamics ⁵	3
PHYS 3650	Classical Mechanics 2 ^{5,7}	3
PHYS 3630	Electro - and Magnetostatic Theory ⁵	3
PHYS 3386	Quantum Mechanics 2 ⁵	3

3 credit hours from 3000 and 4000 level Physics Honours courses	3	
Hours	30	
Years 3-4		
Co-op Requirements (if selected):		
SCI 3980	Co-operative Education Work Term 1	0
SCI 3990	Co-operative Education Work Term 2	0
SCI 4980	Co-operative Education Work Term 3	0
SCI 4990	Co-operative Education Work Term 4 (if a 4th work term is selected)	0
Hours		0
Year 4		
MATH 3320	Algebra 2	3
MATH 3322	Algebra 3	3
3 credit hours of 4000 level Math		3
PHYS 3430	Honours Physics Laboratory	6
PHYS 4680	Statistical Mechanics ⁷	3
6 credit hours from the Department of Mathematics or the Department of Physics & Astronomy:		6
MATH 2030	Combinatorics 1	
MATH 2070	Graph Theory 1	
MATH 2160	Numerical Analysis 1	
MATH 2170	Number Theory 1	
Any 3000 or 4000 level Mathematics or Physics courses		
6 credit hours of electives ⁶		6
Hours		30
Total Hours		120

¹ Students are strongly advised to take MATH 1220, MATH 1230 and MATH 1232.
The following substitutions are allowed (but not advised), provided the grades indicated in brackets are achieved:

- MATH 1210 (A) or MATH 1300 (A) in place of MATH 1220,
- MATH 1500 (A) or MATH 1510 (A) in place of MATH 1230,
- MATH 1700 (A) or MATH 1710 (A) in place of MATH 1232.

² Students are advised to take PHYS 1050 and PHYS 1070.

³ Students may take STAT 1000 and STAT 2000 in lieu of STAT 1150.

⁴ As there are no electives in Year 2 of the program, students should complete the university written English requirement in Year 1. If not completed in Year 1, a "W" course must be completed prior to Year 3 in addition to the required Year 2 courses.

⁵ The corequisite or prerequisite of PHYS 2496 is waived for students in this program. It is recommended that students audit PHYS 2496 in second year and PHYS 3496 in third year.

⁶ These courses may not be used for credit in this program: MATH 1010, MATH 1018, MATH 1020, FA 1020, MATH 1080, MATH 1090, and PHYS 1018 may not count towards the 120 credit hours required for this degree.

⁷ The pre- or corequisite of PHYS 3496 is waived for students in this program. It is recommended that students audit PHYS 2496 in second year and PHYS 3496 in third year.

IMPORTANT: The joint Honours program need not be completed in the manner prescribed in the grid above. The grid indicates the recommended arrangement of the required courses and is meant to be a guide around which students can plan their program.

(Letters in brackets indicate minimum prerequisite standing for further study.)