

# COMPUTER SCIENCE - PHYSICS & ASTRONOMY JOINT, B.SC. HONOURS

## Degree Requirements

### Joint Honours (Including Co-operative Option if Selected)

Course	Title	Hours
<b>Year 1</b>		
One of:		3
PHYS 1050	Physics 1: Mechanics (B) <sup>1</sup>	
PHYS 1020	General Physics 1 (B+)	
One of:		3
PHYS 1070	Physics 2: Waves and Modern Physics (B) <sup>1</sup>	
PHYS 1030	General Physics 2 (B+)	
One of:		3
COMP 1010	Introductory Computer Science 1 (B)	
COMP 1012	Computer Programming for Scientists and Engineers (B)	
COMP 1020	Introductory Computer Science 2 (B)	3
MATH 1300	Vector Geometry and Linear Algebra (B) <sup>2</sup>	3
MATH 1500	Introduction to Calculus (B) <sup>2</sup>	3
MATH 1700	Calculus 2 (B) <sup>2</sup>	3
6 credit hours from the Faculty of Arts, which should include the required 3 credit hour "W" course <sup>3</sup>		6
3 credit hours of electives <sup>4</sup>		3
<b>Hours</b>		<b>30</b>
<b>Year 2</b>		
One of: <sup>4,5</sup>		3
PHYS 2260	Optics	
Physics elective <sup>4</sup>		
PHYS 2386	Introduction to Quantum Mechanics and Special Relativity	3
PHYS 2496	Mathematical Physics 1	3
PHYS 2650	Classical Mechanics 1	3
MATH 1240	Elementary Discrete Mathematics <sup>2</sup>	3
MATH 2720	Multivariable Calculus	3
COMP 2080	Analysis of Algorithms	3
COMP 2140	Data Structures and Algorithms	3
COMP 2160	Programming Practices	3
COMP 2280	Introduction to Computer Systems	3
<b>Hours</b>		<b>30</b>
<b>Summer</b>		
<b>Co-op Requirements (if selected):</b>		
SCI 3980	Co-operative Education Work Term 1 <sup>6</sup>	0
<b>Hours</b>		<b>0</b>
<b>Year 3</b>		
PHYS 2600	Electromagnetic Field Theory	3
One of: <sup>4,5</sup>		3
PHYS 2610	Circuit Theory and Introductory Electronics	

Physics elective <sup>4</sup>		
PHYS 3386	Quantum Mechanics 2	3
PHYS 3670	Classical Thermodynamics	3
PHYS 3496	Mathematical Physics 2	3
COMP 3170	Analysis of Algorithms and Data Structures	3
COMP 3430	Operating Systems	3
6 credit hours of 3000 and/or 4000 level Computer Science courses		6
3 credit hours of electives <sup>4</sup>		3
<b>Hours</b>		<b>30</b>

<b>Summer</b>		
<b>Co-op Requirements (if selected):</b>		
SCI 3990	Co-operative Education Work Term 2 <sup>6</sup>	0
<b>Hours</b>		<b>0</b>

<b>Year 4</b>		
PHYS 4680	Statistical Mechanics	3
12 credit hours of 3000 and 4000 level Honours Physics courses, with at least 6 credit hours at the 4000 level		12
12 credit hours of 3000 or 4000 level courses from Computer Science, with at least 9 credit hours at the 4000 level by the end of Year 4		12
3 credit hours of electives <sup>4</sup>		3
<b>Hours</b>		<b>30</b>

<b>Summer</b>		
<b>Co-op Requirements (if selected):</b>		
SCI 4980	Co-operative Education Work Term 3 <sup>6</sup>	0
SCI 4990	Co-operative Education Work Term 4 (if a 4th work term is selected) <sup>6</sup>	0
<b>Hours</b>		<b>0</b>
<b>Total Hours</b>		<b>120</b>

<sup>1</sup> PHYS 1050 and PHYS 1070 are recommended.

- <sup>2</sup>
- MATH 1220 or MATH 1310 may be taken in place of MATH 1300;
  - MATH 1230, MATH 1510 or MATH 1520 may be taken in place of MATH 1500;
  - MATH 1232 or MATH 1710 may be taken in place of MATH 1700;
  - MATH 1690 may be taken in place of MATH 1500 and MATH 1700.
  - Students who have previously completed COMP 2130 may use it in lieu of MATH 1240.

<sup>3</sup> As there are no open 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.

<sup>4</sup> PHYS 1018 may not count towards the 120 credit hours required for this degree.

<sup>5</sup> Students are required to take at least one of PHYS 2260 or PHYS 2610.

<sup>6</sup> When chosen, the Co-operative Option work terms (SCI 3980, SCI 3990, SCI 4980, and SCI 4990 [if selected]) will normally be completed during the Summer Terms following years 2, 3, and 4 respectively.

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