

# PHYSICS AND ASTRONOMY, B.SC. MAJOR

## Degree Requirements

### Four Year Major (Including Co-operative Option if Selected)

Course	Title	Hours
<b>Year 1</b>		
One of: <sup>1</sup>		3
PHYS 1050	Physics 1: Mechanics (C+)	
PHYS 1020	General Physics 1 (B)	
One of: <sup>1,2</sup>		3
PHYS 1070	Physics 2: Waves and Modern Physics (C+)	
PHYS 1030	General Physics 2 (B)	
MATH 1300	Vector Geometry and Linear Algebra <sup>1</sup>	3
MATH 1500	Introduction to Calculus <sup>1</sup>	3
MATH 1700	Calculus 2 <sup>1</sup>	3
COMP 1012	Computer Programming for Scientists and Engineers <sup>3</sup>	3
6 credit hours from the Faculty of Arts including the "W" requirement		6
6 credit hours of electives <sup>4</sup>		6
<b>Hours</b>		<b>30</b>
<b>Year 2</b>		
One of: <sup>2</sup>		3
PHYS 2260	Optics	
PHYS 2610	Circuit Theory and Introductory Electronics	
PHYS 2386	Introduction to Quantum Mechanics and Special Relativity	3
PHYS 2496	Mathematical Physics 1	3
PHYS 2600	Electromagnetic Field Theory	3
MATH 2720	Multivariable Calculus	3
15 credit hours of electives <sup>4,5</sup>		15
<b>Hours</b>		<b>30</b>
<b>Year 3</b>		
PHYS 2650	Classical Mechanics 1 <sup>2</sup>	3
PHYS 3670	Classical Thermodynamics	3
PHYS 3496	Mathematical Physics 2	3
MATH 2090	Linear Algebra 2	3
<b>Hours</b>		<b>12</b>
<b>Years 3-4</b>		
12 credit hours of 3000 and/or 4000 level Physics and Astronomy courses, with at least 3 credit hours at the 4000 level		12
24 credit hours of electives <sup>4,5</sup>		24
<b>Co-op Requirements (if selected):</b>		
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
<b>Hours</b>		<b>36</b>

### Year 4

PHYS 3386	Quantum Mechanics 2	3
PHYS 3430	Honours Physics Laboratory	6
PHYS 3630	Electro - and Magnetostatic Theory	3
<b>Hours</b>		<b>12</b>
<b>Total Hours</b>		<b>120</b>

- PHYS 1050 and PHYS 1070 are recommended.
  - MATH 1220 may be taken in place of MATH 1300;
  - MATH 1230 or 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 do not take PHYS 1070 or PHYS 1030 in Year 1 must postpone PHYS 2600 until Year 3. PHYS 2260, PHYS 2610 and PHYS 2650 may be taken in Year 2 or Year 3 if the respective prerequisites are met.
- Students who have already taken COMP 1010 before joining the program may count COMP 1010 in lieu of COMP 1012. However, students who have not taken COMP 1010 before entering the program must then take COMP 1012.
- PHYS 1018 may not count towards the 120 credit hours required for this degree.
- Although they are not required courses in the Physics programs, MATH 2080, MATH 2180, and MATH 3340 are recommended electives for the Physics Honours and Four Year Major degrees.

**IMPORTANT:** The four year Major 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 refer to minimum prerequisite standing required for further study.)