

THEORETICAL PHYSICS (THPY)

Department of Physics, College of Engineering and Physical Sciences

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. Since some of the required courses are not offered every semester, students entering the Major in Theoretical Physics should plan their program in consultation with the Faculty Advisor.

Major (Honours Program)

This major requires the completion of 20.00 credits. At least 1.00 of these credits must be obtained from the completion of Liberal Education electives.

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: https://www.uoguelph.ca/bsc/revised_SS (https://www.uoguelph.ca/bsc/revised_SS/)

Code	Title	Credits
Semester 1 ¹		
CHEM*1040	General Chemistry I	0.50
CIS*1300	Programming	0.50
IPS*1500	Integrated Mathematics and Physics I	1.00
Select 0.50 credits from the following:		
BIOL*1070	Discovering Biodiversity	0.50
BIOL*1080	Biological Concepts of Health	0.50
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
Semester 2 ¹		
CHEM*1050	General Chemistry II	0.50
IPS*1510	Integrated Mathematics and Physics II	1.00
MATH*1160	Linear Algebra I	0.50
Select 0.50 credits from the following:		
BIOL*1070	Discovering Biodiversity	0.50
BIOL*1080	Biological Concepts of Health	0.50
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
Semester 3		
MATH*2200	Advanced Calculus I	0.50
MATH*2270	Applied Differential Equations	0.50
PHYS*2240	Thermal Physics	0.50
PHYS*2330	Electricity and Magnetism I	0.50
0.50 Liberal Education electives		0.50
Semester 4		
MATH*2210	Advanced Calculus II	0.50
PHYS*2180	Experimental Techniques in Physics	0.50
PHYS*2310	Mechanics	0.50
PHYS*2340	Electricity and Magnetism II	0.50
0.50 electives		0.50
Semester 5		

IPS*3000	Science Communication	0.50
PHYS*3130	Mathematical Physics	0.50
PHYS*3230	Quantum Mechanics I	0.50
PHYS*3400	Advanced Mechanics	0.50
0.50 electives		0.50

Semester 6

NANO*3600	Computational Methods in Materials Science	0.50
PHYS*3000	Optics: Fundamentals and Applications	0.50
PHYS*3510	Intermediate Laboratory	0.50
PHYS*4040	Quantum Mechanics II	0.50
0.50 electives		0.50

Semester 7

PHYS*4120	Atomic and Molecular Physics	0.50
PHYS*4180	Advanced Electromagnetic Theory	0.50
PHYS*4240	Statistical Physics II	0.50

Select 1.00 credits from the following:

0.50 electives		0.50
0.50 electives		0.50
PHYS*4001	Research in Physics	0.50
PHYS*4500	Advanced Physics Laboratory	0.50

Semester 8

MATH*3260	Complex Analysis	0.50
PHYS*4130	Subatomic Physics	0.50
PHYS*4150	Solid State Physics	0.50
PHYS*4002	Research in Physics (or 0.50 restricted electives)	0.50

0.50 electives		0.50
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Students who have taken physics courses other than IPS*1500 Integrated Mathematics and Physics I or PHYS*1080 Physics for Life Sciences in Semester 1 and IPS*1510 Integrated Mathematics and Physics II or PHYS*1010 Introductory Electricity and Magnetism in Semester 2, may proceed to semester 3 with the permission of the Department of Physics

Restricted Electives

Students must complete 2.00 credits from the following list:

Code	Title	Credits
CIS*2500	Intermediate Programming	0.50
MATH*2000	Proofs, Sets, and Numbers	0.50
MATH*2130	Numerical Methods	0.50
MATH*3100	Differential Equations II	0.50
MATH*3130	Abstract Algebra	0.50
MATH*3160	Linear Algebra II	0.50
MATH*3200	Real Analysis	0.50
MATH*3240	Operations Research	0.50

Credit Summary

(20.00 Total Credits)

Code	Title	Credits
	First year science credits	5.00
	Required science courses semesters 3 – 8	11.00
	Restricted Electives	2.00
	Liberal Education Electives	1.00
	Free Electives - any approved elective for B.Sc. students. , could be less if restricted electives do not count as science	1.00
Total Credits		20

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.