

NANOSCIENCE CO-OP (NANO:C)

Administered jointly by the Department of Chemistry and the Department of Physics, College of Engineering and Physical Sciences

Program Requirements

The Co-op program in Nanoscience is a five year program, including five work terms. Students must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <https://www.recruitguelph.ca/cecs/>).

Nanoscience Academic and Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic Semester 1	Academic Semester 2	Off
2	Academic Semester 3 COOP*1100	Academic Semester 4	COOP*1000 Work Term I
3	Academic Semester 5	COOP*2000 Work Term II	COOP*3000 Work Term III
4	Academic Semester 6	Academic Semester 7	COOP*4000 Work Term IV
5	COOP*5000 Work Term V	Academic Semester 8	N/A

To be eligible to continue in the Co-op program, students must meet a minimum 70% cumulative average requirement after second semester, as well as meet all work term requirements. Please refer to the Co-operative Education program policy with respect to work term performance grading, work term report grading and program completion requirements.

For additional program information students should consult with their Co-op Co-ordinator and Co-op Faculty Advisor, listed on the Co-operative Education web site.

Credit Summary

(22.50 Total Credits)

Code	Title	Credits
	First year science core	4.50
	Required science courses semesters 3 - 8	8.00
	Restricted Electives ¹	0.50-1.00
	Approved Science Electives (depending on restricted elective chosen above)	2.50-3.00
	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)	3.00
	Co-op Work Terms	2.50
	Total Credits	22.5

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Either NANO*4900 Advanced Studies in Nanoscience or NANO*4910 Nanoscience Research Project I

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the

4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

The recommended program sequence is outlined below.

Major (Honours Program)

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 - Fall		
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
CHEM*1040	General Chemistry I	0.50
IPS*1500	Integrated Mathematics and Physics I	1.00
NANO*1000	Introduction to Nanoscience	0.50
Semester 2 - Winter		
CHEM*1050	General Chemistry II	0.50
IPS*1510	Integrated Mathematics and Physics II	1.00
MATH*1160	Linear Algebra I	0.50
BIOL*1070	Discovering Biodiversity	0.50
or BIOL*1080	Biological Concepts of Health	
Semester 3 - Fall		
CHEM*2060	Structure and Bonding	0.50
COOP*1100	Introduction to Co-operative Education	0.00
MATH*2270	Applied Differential Equations	0.50
NANO*2000	Synthesis and Characterization of Nanomaterials I	0.50
PHYS*2330	Electricity and Magnetism I	0.50
CHEM*2820	Thermodynamics and Kinetics	0.50
or PHYS*2240	Thermal Physics	
Semester 4 - Winter		
CHEM*2070	Structure and Spectroscopy	0.50
NANO*2100	Synthesis and Characterization of Nanomaterials II	0.50
PHYS*2310	Mechanics	0.50
1.00 electives ²		1.00
Summer Semester		
COOP*1000	Co-op Work Term I	0.50
Semester 5 - Fall		
NANO*3200	Nanolithographic Techniques	0.50
NANO*3500	Thin Film Science	0.50
CHEM*3860	Quantum Chemistry	0.50
or PHYS*3230	Quantum Mechanics I	
1.00 electives		1.00
Winter Semester		
COOP*2000	Co-op Work Term II	0.50
Summer Semester		
COOP*3000	Co-op Work Term III	0.50
Semester 6 - Fall		
NANO*4100	Biological Nanomaterials	0.50

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NANO*4700	Concepts in Quantum Computing	0.50
1.50 electives		1.50
Semester 7 - Winter		
NANO*3300	Spectroscopy of Nanomaterials	0.50
NANO*3600	Computational Methods in Materials Science	0.50
1.50 electives		1.50
Summer Semester		
COOP*4000	Co-op Work Term IV	0.50
Fall Semester		
COOP*5000	Co-op Work Term V	0.50
1.50 electives		1.50
Semester 8 - Winter		
NANO*4200	Topics in Nanomaterials	0.50
2.00 electives		2.00

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To take PHYS*3230 Quantum Mechanics I in semester 5, then PHYS*2340 Electricity and Magnetism II must be selected as an elective in semester 4.

Note: In semesters 7 and 8, the student must select to do either NANO*4900 Advanced Studies in Nanoscience or NANO*4910 Nanoscience Research Project I.