

**PHY 475 Numerical Methods and Simulations**

3-3-0

This course will cover selected topics in High Performance Computing including cellular automata, finite element methods, molecular dynamics, Monte Carlo methods, and multigrid methods. Applications of the algorithms to the study of classical fields, fluid dynamics, materials properties, nanostructures, and biomolecules will be addressed depending on the interests of the students.

See PHY 575. Students may not take this course for credit if they have received credit for PHY 575.

**PHY 476 Stellar Astrophysics**

3-3-0

An introduction to the properties of stellar atmospheres and interiors. The equations of stellar evolution, nuclear energy generation, radiative transport and stellar model building will be studied. Further topics include the formation of stars, and the physics associated with supernovae, white dwarfs, neutron stars, pulsars and black holes.

**PHY 480 Honours Research Dissertation**

6-1-6

Each student is required to carry out either an experimental or theoretical project under the supervision of a faculty member. A plan outlining the proposed research must be submitted for approval during the first four weeks of the course. Each student will present his/her results in the form of a seminar, an oral thesis defense, and a written dissertation.

*Prerequisite: U3 Honours Physics registration or permission of the department.*

# Pre-Medicine Double Major (B.Sc)

## Faculty

Administered by the  
Chair of Biology

## Program Overview (75 credits)

MAJMED

The Pre-Medicine double major allows students to complete the necessary pre-requisites to apply to medical schools while at the same time pursuing a liberal arts education. The required and optional courses listed below correspond to the entrance requirements of many Canadian and American medical schools, as well as address the requirements of most related professional schools (such as dentistry or physiotherapy).

It is important to note that every medical (and professional) school has its own specific set of prerequisite courses, and these occasionally change. Up-to-date prerequisites are usually listed on the admissions site for an MD program. A student in the Pre-Medicine major should consult the websites of any schools in which they are interested as they plan their optional courses.

To enter the Pre-Medicine major, a student must register in a separate primary major as well. A student can select their primary major from any discipline offered at Bishop's, including Biology, Biochemistry, Chemistry, Business, Liberal Arts, or Psychology. Courses can be double-counted towards both the primary major and the Pre-Medicine major.

### Entrance Requirements

The following criteria apply to entry into the B.Sc. Pre-medicine double major:

- a student must be admitted to a primary major at Bishop's;
- a student can be admitted directly into the Pre-medicine major from high school or CEGEP if entering with an overall average of 85% or greater;
- if not admitted directly, a student can add the Pre-medicine double major once they have completed 60 course credits (not including lab credits), including advanced credits, and have an overall average of 75% or greater;
- a student must maintain an overall average of 75% or greater at the end of each academic year to remain in the program.

Quebec students with a completed D.E.C. will be granted credit for Y1 Year courses (30 credits) if they successfully completed collegial courses in Chemistry (General Chemistry, Solutions Chemistry), Physics (Mechanics, Electricity and Magnetism), Mathematics (Differential Calculus, Integral Calculus) and Biology (General Biology, Cell and Molecular Biology). Students lacking any of these courses can take their equivalents at Bishop's, and their advanced credits will be reduced accordingly.

## Program Requirements

### 1. B.Sc. Y1 Year (27 credits; non-Quebec students)

BIO 196 / BIL 196	Introductory Biology I: Introduction to Cellular and Molecular Biology
CHM 191 / CHL 191	General Chemistry I
CHM 192 / CHL 192	General Chemistry II
MAT 191	Calculus I
MAT 192	Calculus II
PHY 193 / PHL 193	Physics for the Life Sciences I
PHY 194 / PHL 194	Physics for the Life Sciences II
ENG 116	Effective Writing (or other ENG)
HUM (CLA, ENG, HIS, RSC, PHI or LIB)	

*Note: Some Quebec medical schools require PHY 206 Waves and Optics in addition to PHY 193 and PHY 194. Students should research their preferred medical school to confirm whether or not they should take PHY 206.*

### 2. Pre-Medicine Required Courses: (36 Credits)

The following courses must be taken in order to meet the requirements of the major.

BCH 210	General Biochemistry
BCH 313 / BCL 313	Metabolism
BIO 201	Cell and Molecular Biology
BIO208 / BIL 208	Genetics
BIO 233	Human Anatomy
BIO 336	Animal Physiology I
BIO 337 / BIL 337	Animal Physiology II
CHM 111 / CHL 111	Organic Chemistry I
CHM 211 / CHL 211	Organic Chemistry II
PHY 101	Statistical Methods in Experimental Science
PSY 101	Introduction to Psychology
SOC 101	Introduction to Sociology

### 3. Pre-Medicine Required Options: (12 Credits)

*Note: These courses must be taken in addition to the Y1 Humanities and English requirements.*

At least 2 Second Language Courses.

At least 2 Courses in English Literature. This includes courses in literature and comprehension, not writing or composition.

### 4. Free Electives: (48 Credits)

These credits can be used to fulfill the requirements of the primary major.

## Useful Electives

These courses are not required for the Pre-Medicine Major, but will deepen your background in biomedical topics and may enhance your success in writing the MCAT, preparing your application essay, and/or performing well in the interview.

BCH 381	Immunology
BCH 411	Molecular Biology
BIO 311	Quantitative Methods in Health Sciences
BIO 320	Programmed Cell Death
BIO 352 / BIL 352	Microbiology
BIO 359	Human Genetics
BIO 411	Seminar in Health Sciences
CHM 121	Inorganic Chemistry I
CHM 131 / CHL 131	Physical Chemistry I
CHM 141 / CHL 141	Analytical Chemistry
CHM 341 / CHL 341	Principles and Practices of Chemical Spectroscopy and Mass Spectrometry
CLA 170	Greek and Latin Terminology for Medicine and the Life Sciences
PBI 275	Health Psychology 1
PBI 276	Health Psychology 2
PHY 206	Wave and Optics
PSY 102	Introduction to Psychology II