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 all 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 most Canadian and American medical schools, but also address the requirements of most related professional schools (such as dentistry or physiotherapy). Students must register in a separate, primary major as well as the pre-medicine major and complete all of the requirements of both majors in order to graduate. Students 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
Students must already be admitted to their primary major at Bishop’s. Students must meet two criteria to be considered for entry into the B.Sc. Pre-medicine double major:

- 60 completed course credits (not including lab credits), including advanced credits
- An overall average of 75%. Students must maintain this average to graduate from the program.

Quebec students with a completed D.E.C. will be granted credit for Year 1 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  Introductory Biology I: Introduction to Cellular and Molecular Biology
   CHM 191  General Chemistry I
   CHM 192  General Chemistry II
   PHY 193  Physics for the Life Sciences I
   PHY 194  Physics for the Life Sciences II
   MAT 198  Calculus I for Life Sciences
   ENG 116  Effective Writing (or other ENG)
   HUM  (CLA, ENG, HIS, RSC, PHI or LIB ARTS)

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  Metabolism
   BIO 201  Cell and Molecular Biology
   BIO 233  Human Anatomy
   BIO 336  Animal Physiology I
   BIO 337  Animal Physiology II
   CHM 111  Organic Chemistry I
   CHM 211  Organic Chemistry II
   PHY 101  Statistical Methods in Experimental Science
   PSY 101  Introduction to Psychology
   PSY 102  Introduction to Psychology II
   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.
   BIO 208  Genetics
   BIO 311  Quantitative Methods in Health Sciences
   BIO 320  Programmed Cell Death
   BIO 428  Advanced Physiology
   CHM 121  Structure and Bonding
   CHM 131  Physical Chemistry I
   CHM 141  Analytical Chemistry
   CHM 311  Organic Chemistry III
   CLA 170  Greek and Latin Terminology for Medicine and the Life Sciences
   PBI 275  Health Psychology 1
   PBI 276  Health Psychology 2