

BIOPHYSICS

The organization and administration of the graduate program in biophysics are the responsibility of the Biophysics Interdepartmental Group (BIG). The group consists of those members of the graduate faculty whose research interests lie wholly or partly in biophysics. Biophysics spans all areas of the life sciences from molecular structure to human biology and uses the ideas and techniques of the physical sciences to solve biological problems. The specific sub-disciplines of BIG are molecular, cellular, structural, and computational biophysics.

Administrative Staff

Director and Graduate Program Coordinator

Hermann Eberl (MacN 508, Ext. 62622)
heberl@uoguelph.ca

Graduate Program Assistant

Janice Ilic (207 MacNaughton, Ext. 58176)
big@uoguelph.ca

Graduate Faculty

This list may include Regular Graduate Faculty, Associated Graduate Faculty and/or Graduate Faculty from other universities.

Josef D. Ackerman

B.Sc. Toronto, MA SUNY, PhD Cornell - Professor
Graduate Faculty

Madhur Anand

B.Sc., PhD Western Ontario - Professor
Graduate Faculty

France-Isabelle Auzanneau

Maitrise, DEA, PhD Paris XI-Orsay - Professor
Graduate Faculty

Leah Bent

B.Sc., M.Sc. Guelph, PhD British Columbia - Professor
Graduate Faculty

Leonid S. Brown

M.Sc., PhD Moscow State - Professor and Associate Dean (Graduate Studies and Research), College of Engineering and Physical Sciences
Graduate Faculty

Stephen H. M. Brown

BHK, MHK Windsor, PhD Waterloo - Associate Professor
Graduate Faculty

John Dawson

B.Sc. Wilfrid Laurier, PhD Alberta - Professor and Associate Dean (Academic), College of Biological Sciences
Graduate Faculty

John R. Dutcher

B.Sc. Dalhousie, M.Sc. British Columbia, PhD Simon Fraser - Professor
Graduate Faculty

Animesh Dutta

B.Sc. Bangladesh, M.Eng. Thailand, PhD Dalhousie, P.Eng - Professor
Graduate Faculty

Hermann J. Eberl

Dipl. Math (M.Sc.), PhD Munich Univ. of Tech. - Professor

Graduate Faculty

Khashayar Ghandi

B.Sc. Shiraz (Iran), M.Sc. Tehran (Iran), PhD Simon Fraser University - Professor
Graduate Faculty

Todd E. Gillis

B.Sc., M.Sc. Guelph, PhD Simon Fraser - Professor
Graduate Faculty

Steffen P. Graether

B.Sc., M.Sc., PhD Queen's - Professor
Graduate Faculty

Amy L. Greer

B.Sc., Mount Allison, M.Sc., Trent, PhD Arizona State - Associate Professor
Graduate Faculty

Marc Habash

B.Sc. Toronto, M.Sc. Western, PhD Guelph - Associate Professor
Graduate Faculty

Andreas Heyland

B.Sc., M.Sc. Zurich, PhD Florida - Professor
Graduate Faculty

Lorraine C. Jadeski

B.Sc. Guelph, M.Sc. Waterloo, PhD Western - Associate Professor
Graduate Faculty

Cezar Khursigara

B.Sc. Ryerson, PhD McGill - Professor
Graduate Faculty

Matthew S. Kimber

B.Sc., PhD Toronto - Associate Professor
Graduate Faculty

Stefan W. Kycia

B.Sc. McGill; MS Pennsylvania; PhD Iowa - Associate Professor and Interim Chair
Graduate Faculty

Vladimir Ladizhansky

BS Moscow Institute of Physics and Technology; MS, PhD Weizmann Institute of Science (Rehovot, Israel) - Professor
Graduate Faculty

Anna T. Lawniczak

M.Sc. Wroclaw, PhD Southern Illinois - Professor
Graduate Faculty

Huiyan Li

BEng Harbin, MSc Victoria, PhD McGill - Assistant Professor
Graduate Faculty

Jacek Lipkowski

M.Sc., PhD, D.Sc. Warsaw - Professor Emeritus
Associated Graduate Faculty

Alejandro G. Marangoni

B.Sc. McGill, PhD Guelph - Professor
Graduate Faculty

Genevieve S. Newton

B.Sc. Laurentian, DC Chicago, M.Sc., PhD Guelph - Scientific Director,
FRINGE, Online Education for Medical Professionals
Associated Graduate Faculty

Derek O'Flaherty

B.Sc., PhD Concordia - Assistant Professor
Graduate Faculty

Joanne M. O'Meara

B.Sc., PhD McMaster - Professor
Graduate Faculty

Michele L. Oliver

BPE McMaster, MPE, M.Sc., PhD New Brunswick, PEng. - Professor
Graduate Faculty

K. Peter Pauls

B.Sc., M.Sc., PhD Waterloo - Professor
Graduate Faculty

Erica Pensini

B.Sc., M.A.Sc. Milano, PhD Toronto, PEng. - Associate Professor
Graduate Faculty

Geoffrey A. Power

BKin, M.Sc. Memorial, PhD Western - Associate Professor
Graduate Faculty

W. Glen Pyle

B.Sc. Guelph, PhD Tennessee - Professor
Graduate Faculty

Scott Ryan

B.Sc. Memorial, PhD Ottawa - Associate Professor
Graduate Faculty

William R. Smith

BASc, MASc Toronto, M.Sc. PhD Waterloo - University Professor Emeritus
Associated Graduate Faculty

John Z. Srbely

B.Sc. Laurentian, DC Canadian Memorial Chiropractic College, PhD
Guelph - Associate Professor
Graduate Faculty

Lori A. Vallis

B.Sc., MA Ottawa, PhD Waterloo - Professor
Graduate Faculty

Robert Wickham

B.Sc. Toronto, PhD Chicago - Associate Professor
Graduate Faculty

Allan Willms

B.Math., M.Math. Waterloo, PhD Cornell - Professor
Graduate Faculty

Simon X. Yang

B.Sc. Peking, M.Sc. Sinica, M.Sc. Houston, PhD Alberta, PEng. - Professor
Graduate Faculty

MSc Program

Admission Requirements

Students may be admitted to the MSc program in biophysics from a range of undergraduate programs, including physics, biology, biochemistry, microbiology, chemistry, mathematics, engineering, or computing science. To be considered for admission, applicants should meet the minimum requirements of a four-year honours degree with a 73% (B) average during the final two years of study. Applicants should briefly indicate their research interests and, if possible, their preferred advisors.

Program Requirements

Students in the MSc program will be under the guidance of an interdepartmental advisory committee. A total of 1.5 credits are required, one of which is usually BIOP*6000 Concepts in Biophysics. In addition, all students are required to complete the seminar course BIOP*6010 Biophysics Seminar. The advisory committee may require additional courses. An average of 70% (B-) or better must be obtained in the prescribed courses. Further information may be obtained from the chair of the group. When the course work is satisfactorily completed, the submission and successful defence of an appropriate thesis on an approved topic completes the requirements for the MSc in Biophysics.

PhD Program

Admission Requirements

Applicants for the PhD program should have a recognized master's degree in an appropriate field, with a 77% (B+) average in their postgraduate studies. Applicants should briefly indicate their area of research interest and preferred advisor(s). It is often beneficial for applicants to talk with potential advisors before submitting an application.

Direct admission to the PhD program may be permitted for applicants holding a bachelor's degree with high academic standing. Students enrolled in the master's degree program who achieve a superior academic record and show a particular aptitude for research may be permitted to transfer to the PhD program. The application to transfer should be made to the chair of the biophysics program between the end of the second semester and the end of the fourth semester of work towards the master's degree.

Program Requirements

Students in the PhD program will be under the guidance of an interdepartmental advisory committee. For students who completed the MSc degree in a program other than Biophysics at the University of Guelph, a total of 1.0 graduate course credits are required, one of which is usually BIOP*6000 Concepts in Biophysics. For students who transfer directly into the PhD program from the MSc program in Biophysics, or who complete the MSc program in Biophysics at the University of Guelph, no additional course credits are required. In the case of students who enter the PhD program from the BSc degree, 1.5 graduate course credits are required, one of which is BIOP*6000 Concepts in Biophysics. In addition, all students are required to complete the non-credit seminar course, BIOP*6010 Biophysics Seminar. The advisory committee may require additional courses for any student. An average of 70% (B-) or better must be obtained in the prescribed courses. As early as feasible, but no later than the final semester of the minimum duration, a PhD student is required to complete a qualifying examination to assess their knowledge of the subject. This examination should normally be taken within the first five semesters of registration as a PhD student. When the

qualifying examination and the course work are satisfactorily completed, the submission and successful defense of an acceptable thesis on an approved topic completes the requirements for the PhD in Biophysics.

Courses

BIOP*6000 Concepts in Biophysics Winter Only [0.50]

This course will emphasize basic concepts in molecular, cellular and structural biophysics arising from key journal publications and their impact on present day research trends.

Department(s): Dean's Office, College of Engineering and Physical Sciences

Location(s): Guelph

BIOP*6010 Biophysics Seminar Unspecified [0.00]

This public research seminar is based on presentations by all PhD students in the Biophysics program in yearly intervals after passing the qualifying exam and by all MSc students in their second year of studies. Students are required to attend all seminars presented during the semester in which they are registered for the course.

Department(s): Dean's Office, College of Engineering and Physical Sciences

Location(s): Guelph

BIOP*6100 Scientific Communication and Research Methods in Biophysics Unspecified [0.50]

The development and refinement of the skills of scientific communication, emphasizing oral presentation and writing skills, in the context of developing a literature review or thesis proposal. All Biophysics students will normally take this within 4 semesters of entering the program.

Department(s): Dean's Office, College of Engineering and Physical Sciences

Location(s): Guelph

BIOP*6950 Advanced Topics in Biophysics Unspecified [0.50]

This course provides opportunities for graduate students to study special topics in contemporary biophysical research under the guidance of graduate faculty members with pertinent expertise. Proposed course descriptions are considered by the Director of the Biophysics program on an ad hoc basis, and the course will be offered according to demand.

Department(s): Dean's Office, College of Engineering and Physical Sciences

Location(s): Guelph

With approval of the Advisory Committee a student can take courses offered by other departments in Life, Physical and Engineering Sciences. Example courses could be, but not limited to:

Courses in Related Subjects

Biomedical Sciences

Code	Title	Credits
BIOM*6110	Research Methods in Biomedical Sciences	0.50
BIOM*6160	Cellular Biology	0.50

Chemistry

Code	Title	Credits
CHEM*7360	Regulation in Biological Systems	0.50
CHEM*7370	Enzymes	0.50
CHEM*7380	Cell Membranes and Cell Surfaces	0.50
CHEM*7310	Selected Topics in Biochemistry	0.50

Computing and Information Science

Code	Title	Credits
CIS*6050	Neural Networks	0.50
CIS*6060	Bioinformatics	0.50
CIS*6080	Genetic Algorithms	0.50
CIS*6420	Soft Computing	0.50

Engineering

Code	Title	Credits
ENGG*6070	Medical Imaging	0.50
ENGG*6130	Physical Properties of Biomaterials	0.50
ENGG*6150	Bio-Instrumentation	0.50
ENGG*6560	Advanced Digital Signal Processing	0.50

Human Health and Nutritional Sciences

Code	Title	Credits
HHNS*6440	Nutrition, Gene Expression and Cell Signalling	0.50

Mathematics and Statistics

Code	Title	Credits
MATH*6051	Mathematical Modelling	0.50
MATH*6071	Biomathematics	0.50
STAT*6761	Survival Analysis	0.50
STAT*6950	Statistical Methods for the Life Sciences	0.50

Molecular and Cellular Biology

Code	Title	Credits
MCB*6310	Advanced Topics in Molecular and Cellular Biology	0.50
MCB*6370	Protein Structural Biology and Bioinformatics	0.50

Physics

Code	Title	Credits
PHYS*7010	Quantum Mechanics I	0.50
PHYS*7020	Quantum Mechanics II	0.50
PHYS*7040	Statistical Physics I	0.50
PHYS*7050	Statistical Physics II	0.50