

# BIOLOGICAL SCIENCES (BIOL)

## BIOL 7100 Core Skills in Biological Sciences Research 3 cr

Learning skills for a career in scientific research in Biological Sciences including: using the scientific method, applying for NSERC funding, maintaining a CV, abstract writing, ethics in research, research protocols and biosafety and biohazards, statistical designs and their assumptions, literature searching, critical thinking, critiquing the scientific literature, making teaching and research presentations. Not to be held with Methodology of Research ANAT 7090.

## BIOL 7140 Advanced Physiology 6 cr

An in-depth study of topics related to how changing internal and external environments influence life sustaining physiological processes. Topics include plant and animal stress, endocrine & electrophysiology, metabolism and molecular biology of solute transport.

**Equiv To:** ZOOL 7140

## BIOL 7142 Advanced Physiology 3 cr

An in-depth study of topics selected from physiological research of the department including plant, animal, stress physiology, ecophysiology, electrophysiology, endocrine or neurophysiology and others. Topics will be focused on the research area of each student to acquire specialized knowledge in a particular topic.

## BIOL 7202 Evolutionary Biology 3 cr

An in-depth study of topics selected from research interests within the department that may cover an evolutionary theme. This course will allow students to acquire or expand on specialized knowledge in a particular evolutionary topic through a series of readings or a combination of readings and lectures.

## BIOL 7220 Critical Thinking in Biological Sciences 3 cr

A core graduate level course within the Ph.D. program designed to stimulate discussion and thought in key areas applicable to the student's research discipline.

## BIOL 7230 Advanced Topics in Zoology 6 cr

A seminar on current research topics in Zoology.

**Equiv To:** ZOOL 7230

## BIOL 7240 Wetland Ecology 6 cr

A study of marsh, bog, and fen communities, with emphasis on their history, soil-plant relationships, and species distribution. Field work at the University Field Station (Delta Marsh) and nearby bog and fen sites will be an integral part of the course.

**Equiv To:** BOTN 7240

## BIOL 7250 Advanced Evolution and Systematics 3 cr

This course will first consider theoretical and practical aspects of systematics, and then consider how systematic and population-level studies have illuminated our understanding of evolutionary processes.

## BIOL 7302 Environmental Biology and Ecology 3 cr

An in-depth study of topics selected from environment and ecology interests of the department, including population ecology, fisheries biology, plant/animal interactions, animal behaviour, ecosystem dynamics and restoration. Topics will be chosen to acquire specialized knowledge in a particular topic.

## BIOL 7352 Aquatic Biology 3 cr

An in-depth study of topics covering all aspects of aquatic biological interests in the department including wetland ecology, limnology, oceanography, toxicology, conservation, and others. Topics will focus on the research interests of students so they may acquire specialized knowledge in particular areas.

## BIOL 7360 Problems in Biological Statistics 3 cr

The course discusses statistical problems and techniques which specifically apply to biological research. Laboratory exercises will be based primarily on examples from field research.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: STAT 3130 or the consent of the instructor.

**Equiv To:** ZOOL 7360

## BIOL 7370 Special Topics in Algal Ecology 6 cr

Directed study and project(s) in selected aspects of the ecology of freshwater phytoplankton, periphyton and metaphyton.

**Equiv To:** BOTN 7370

## BIOL 7440 Methods and Approaches to the Analysis of Biological Data

### Part 1 3 cr

Methods for handling biological data arising from field surveys; planning and undertaking biological studies. Theory of experimental design, vegetation sampling, multivariate analysis, techniques of remote sensing, spatial analysis and modeling.

**Equiv To:** BOTN 7440

**Mutually Exclusive:** BIOL 4312

## BIOL 7450 Methods and Approaches to the Analysis of Biological Data

### Part 2 3 cr

Analysis of complex biological data sets arising from field surveys, vegetation sampling and remote sensing using techniques from Part 1.

**Equiv To:** BOTN 7450

## BIOL 7502 Cell and Developmental Biology 3 cr

An advanced topics course which will be an in-depth study of current research topics in cellular and developmental biology. An undergraduate background in cell and developmental biology or related areas is required.

## BIOL 7540 Methods for Analysing Biological Data 3 cr

A survey of methods and approaches for analyzing biological data containing many variables, suitable for graduate students. Offered in alternate years. Not to be held with BIOL 4312.

**Equiv To:** BIOL 4312, BIOL 4650, BOTN 7440

## BIOL 7554 Molecular Biology of Eukaryotes (DNA) 3 cr

This is a lab intensive techniques course designed for 4th year undergraduate and graduate students interested in understanding the theory application of molecular methods specifically focusing on eukaryotic DNA. Students will learn essential and cutting-edge molecular techniques involved in gene-structure, amplification, transformation and sequencing.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: BIOL 2520 (Cell Biology) or equivalent.

## BIOL 7556 Molecular Biology of Eukaryotes (RNA) 3 cr

This is a lab intensive techniques course designed for 4th year undergraduate and graduate students interested in understanding the theory and application of molecular methods specifically focusing on eukaryotic RNA. Students will learn essential and cutting-edge molecular techniques involved in identifying messenger RNA expression of a particular target protein in plant or animal tissue.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: BIOL 2520 (Cell Biology) or equivalent.

## BIOL 7580 Topics in Plant Pathology 3 cr

Current and specialized aspects of plant pathology studied through lectures, seminars, prescribed readings and laboratory projects.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: BIOL 4250 or equivalent, or consent of department head.

**Equiv To:** BOTN 7380

**BIOL 7590 Pathology of Trees and Shrubs 3 cr**

Lectures, seminars and readings focusing on special problems relating to the pathology of woody plants. Emphasis on ornamental shrub, shade tree, and forest tree species of local importance.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: BIOL 4250 or equivalent, or consent of department head.

**Equiv To:** BOTN 7390

**BIOL 7600 Topics in Biological Sciences 3 cr**

A general topics course to reflect an in-depth study of current interest topics to extend or acquire specialized knowledge in a particular area of biological interest. A subtitle may be added to the current title to reflect specialized interests.

**BIOL 7602 Directed Studies in Biological Sciences 3 cr**

A course to provide a broad knowledge of different topics within Biological Sciences peripheral to the specific topic of the student's thesis and will not become the introductory chapter of the thesis. Students will complete assignments by themselves but will participate and be evaluated as a group.

**BIOL 7880 Ecology Project Course 3 cr**

This course provides experience in the organization and execution of team research into current ecological issues. Teams consist of a graduate student team leader, 3-6 undergraduates, and a faculty advisor. Each project team identifies a specific research question, creates a proposal for answering it, and presents their results in a public forum.

**Equiv To:** BOTN 7880, ZOOL 7880