BIOLOGY

The minimum Foundation Year (U0) science requirements in the B.A. & Sc. may not satisfy the introductory science requirements of all medical/dental schools. Please see your departmental advisor for more information.

About Biology

Biology is the study of living things at the molecular, cellular, organismal, and ecosystem levels. It deals with fundamental questions such as:

- the origin and evolution of plants and animals**;**
- interactions between living organisms and their environment;
- mechanisms of embryonic development;
- structure and function of the living cell and individual molecules within it;
- molecular basis of inheritance;
- biochemical and genetic basis of human diseases; and
- how the brain and the nervous system control behaviour.

The study of biology also has vast practical applications. The knowledge, methods, and concepts developed through research in the various fields of biology are applied extensively in agriculture, medicine, pharmaceutical development, biotechnology, genetic engineering, environmental protection, and wildlife management.

The Department of Biology offers:

- Liberal program;
- Major program;
- Joint Majors with Computer Science and with Mathematics;
- Honours program;
- Joint Honours with Computer Science;
- **Minor** program;
- **Minor concentration** in Science for Arts students;
- Biology **Major** and **Honours option** in Quantitative Biology; as well as
- **Major** and **Minor concentrations** in the B.A. & Sc.

The programs in Biology provide you with an introduction to the broad spectrum of Biological Sciences in contrast to more specialized programs in Biochemistry, Microbiology, Pharmacology, Physiology, and Anatomy and Cell Biology. The B.Sc. degree in Biology prepares you for a wide range of employment opportunities as well as entry to professional schools in medicine, veterinary science, dentistry, agriculture, nursing, education, and library science. It also provides a solid background for those interested in careers related to environmental protection, wildlife management, biotechnology, and genetic engineering. The B.Sc. degree in Biology can also lead to post-graduate studies and research careers in universities, research institutes, hospitals, and industrial or governmental laboratories.

The Department of Biology's well-equipped research laboratories are located in the Stewart Biology Building, 1205 Docteur Penfield Avenue and in the adjacent Bellini Life Sciences Building as well as in the Duff Medical Building. The Department includes many biologists who are international leaders in their research fields, but who nevertheless remain deeply committed to undergraduate education. We have outstanding infrastructure for cell, developmental, and neurobiology research, and extensive links to biomedical scientists throughout McGill and all over the world. Our ecology and evolutionary biology group is also internationally prominent and dedicated to studying aquatic and terrestrial ecosystems.

Our core undergraduate program will expose you to the broad areas of biology at all of these levels of complexity. At the same time you will be able to focus on topics related to your specific interests through complementary and elective courses. Beyond the large introductory classes, our class sizes are relatively small and you will have lots of opportunities for contact with your instructors; this is one of our strengths! Biology's teaching and research resources are extended by affiliation with the Redpath Museum, the hospitals and research institutes of the McGill University Health Centre, the Montreal Neurological Institute, the Sheldon Biotechnology Institute, and the Smithsonian Tropical Research Institute in Panama. Field courses enable you to study biology in a natural setting, in local ecosystems (e.g., at McGill's Gault Nature Reserve), and in distant ones such as Barbados, Panama, and East Africa. The Biology Department is also deeply committed to providing individual research experiences to its undergraduates. U2- and U3-level students, not just Honours program students, can carry out semester- or year-long independent study projects for course credit in Biology department research labs. Numerous summer opportunities are also available.

Undergraduate students are represented by the MBSU (McGill Biology Students Union), in the Departmental Assembly and in Standing Committees.

Note to those interested in the B.A. & Sc. program: Both a major and a minor concentration in Biology are available to students pursuing the B.A. & Sc. degree. These concentrations are described on the Undergraduate B.A. & Sc. Biology page (p. 3).

Preprogram Requirements

Requirements for the Major and Honours programs in Biology are:

- two courses in elementary biology;
- two courses in general chemistry;
- two courses in mathematics (as per the Freshman science requirements);
- one or two courses in physics (mechanics and electromagnetism), depending on your choice of upper year courses.

Students entering the B.A. & Sc., the Liberal program, and the Biology Science Minor have the same biology, chemistry, and mathematics requirements. The physics requirements will vary according to their future direction. Note that satisfying the minimum Freshman science requirements does not necessarily qualify students for medical or dental school admissions requirements.

Students planning to take one of the joint majors or the Quantitative Biology Major or Honours options should consult:

Undergraduate Advisor
Stewart Biology Building, Room N7/9B
Telephone: 514-398-4109
Email: nancy.nelson@mcgill.ca
Website: mcgill.ca/biology/undergraduate-studies/advising-planning/biology-advising

to ensure they are taking the appropriate prerequisites.

Biology Concentrations

Note: The concentrations set out below are only guidelines for specialized training. They do not constitute sets of requirements.

Note: Courses used to satisfy the complementary course components of the Major program must be at the 300+ level. Any 200 level courses listed below must be taken as electives.

Note: Please confirm the guidelines and policies for taking courses outside Arts and Science.

If you are interested in advanced studies in any biological discipline, you are strongly advised to develop your skills in computing as appropriate. As an aid to students wishing to specialize, key and suggested courses are listed by discipline.

CEEB: Conservation, Ecology, Evolution, and Behaviour

Expand allContract all

Course	Title	Credits
BIOL 304	Evolution.	3
BIOL 305	Animal Diversity.	3
BIOL 308	Ecological Dynamics.	3
BIOL 309	Mathematical Models in Biology.	3
BIOL 310	Biodiversity and Ecosystems.	3
BIOL 311	Advanced Methods in Organismal Biology.	3
BIOL 320	Evolution of Brain and Behaviour.	3
BIOL 331	Ecology/Behaviour Field Course.	3
BIOL 334D1	Applied Tropical Ecology.	1.5
BIOL 334D2	Applied Tropical Ecology.	1.5
BIOL 335	Marine Mammals.	3
BIOL 352	Dinosaur Biology.	3
BIOL 377	Independent Reading Project.	3
BIOL 413	Directed Reading.	1
BIOL 418	Freshwater Invertebrate Ecology.	3
BIOL 428	Biological Diversity in Africa.	3
BIOL 429	East African Ecology.	3
BIOL 432	Limnology.	3
BIOL 436	Evolution and Society.	3
BIOL 441	Biological Oceanography.	3
BIOL 451	Research in Ecology and Development in Africa.	3
BIOL 465	Conservation Biology.	3
BIOL 466	Independent Research Project 1.	3
BIOL 467	Independent Research Project 2.	3
BIOL 468D1	Independent Research Project 3.	3
BIOL 469D1	Independent Research Project 4.	4.5
BIOL 507	Animal Communication.	3
BIOL 510	Advances in Community Ecology.	3
BIOL 515	Advances in Aquatic Ecology.	3
BIOL 517	Cognitive Ecology.	3
BIOL 540	Ecology of Species Invasions.	3
BIOL 553	Neotropical Environments.	3
BIOL 569	Developmental Evolution.	3
BIOL 573	Vertebrate Palaeontology Field Course.	3
BIOL 592	Integrated Bioinformatics.	3
BIOL 594	Advanced Evolutionary Ecology.	3
GEOG 302	Environmental Management 1.	3
GEOG 305	Soils and Environment.	3
GEOG 308	Remote Sensing for Earth Observation.	3
GEOG 322	Environmental Hydrology.	3
GEOG 470	Wetlands.	3
REDM 400	Science and Museums.	3
MAC Campus:		
PARA 424	Fundamental Parasitology.	3
PLNT 358	Flowering Plant Diversity.	3
PLNT 460	Plant Ecology.	3
WILD 307	Natural History of Vertebrates.	3
WILD 350	Mammalogy.	3
WILD 415		3
WILD 420	Ornithology.	3
WILD 421	Wildlife Conservation.	3

MCDB: Molecular, Cellular, and Developmental Biology

Expand allContract all

Course	Title	Credits
BIOL 300	Molecular Biology of the Gene.	3
BIOL 301	Cell and Molecular Laboratory.	4
BIOL 302	Fundamentals of Genetics and Genomics.	3
BIOL 303	Developmental Biology.	3
BIOL 306	Neural Basis of Behaviour.	3
BIOL 309	Mathematical Models in Biology.	3
BIOL 313	Eukaryotic Cell Biology.	3
BIOL 314	Molecular Biology of Cancer.	3
BIOL 316	Biomembranes and Organelles.	3
BIOL 377	Independent Reading Project. (course retired)	3
BIOL 413	Directed Reading.	1
BIOL 416	Genetics of Mammalian Development.	3
BIOL 466	Independent Research Project 1.	3
BIOL 467	Independent Research Project 2.	3
BIOL 468D1	Independent Research Project 3.	3
BIOL 469	Independent Research Project 4.	9
BIOL 518	Advanced Topics in Cell Biology.	3
BIOL 524	Topics in Molecular Biology.	3
BIOL 544	Genetic Basis of Life Span.	3

BIOL 546	Genetics of Model Systems.	3
BIOL 551	Principles of Cellular Control.	3
BIOL 565	Cell and Tissue Mechanobiology.	3
BIOL 568	Topics on the Human Genome.	3
BIOL 569	Developmental Evolution.	3
BIOL 588	Advances in Molecular/Cellular Neurobiology.	3
BIOL 592	Integrated Bioinformatics.	3
BIOC 311	Metabolic Biochemistry.	3
HGEN 400	Genetics in Medicine.	3
MIMM 314	Intermediate Immunology.	3

NBB: Neurobiology and Behaviour

Expand allContract all

Course	Title	Credits
BIOL 300	Molecular Biology of the Gene.	3
BIOL 303	Developmental Biology.	3
BIOL 304	Evolution.	3
BIOL 305	Animal Diversity.	3
BIOL 306	Neural Basis of Behaviour.	3
BIOL 307	Behavioural Ecology.	3
BIOL 309	Mathematical Models in Biology.	3
BIOL 320	Evolution of Brain and Behaviour.	3
BIOL 377	Independent Reading Project.	3
BIOL 389	Laboratory in Neurobiology.	3
BIOL 413	Directed Reading.	1
BIOL 414	Invertebrate Brain Circuits and Behaviours .	3
BIOL 466	Independent Research Project 1.	3
BIOL 467	Independent Research Project 2.	3
BIOL 468D1	Independent Research Project 3.	3
BIOL 469D1	Independent Research Project 4.	4.5
BIOL 506	Neurobiology of Learning.	3
BIOL 507	Animal Communication.	3
BIOL 517	Cognitive Ecology.	3
BIOL 530	Advances in Neuroethology.	3
BIOL 532	Developmental Neurobiology Seminar.	3
BIOL 580	Genetic Approaches to Neural Systems.	3
BIOL 588	Advances in Molecular/Cellular Neurobiology.	3
BIOL 592	Integrated Bioinformatics.	3
ANAT 321	Circuitry of the Human Brain.	3
ANAT 322	Neuroendocrinology.	3
NEUR 310	Cellular Neurobiology.	3
PHAR 562	Neuropharmacology.	3
PHGY 311	Channels, Synapses and Hormones.	3
PHGY 314	Integrative Neuroscience.	3
PHGY 425	Analyzing Physiological Systems.	3
PHGY 451	Advanced Neurophysiology.	3
PHGY 556	Topics in Systems Neuroscience.	3
PSYC 311	Human Cognition and the Brain.	3
PSYC 318	Behavioural Neuroscience 2.	3
PSYC 342	Hormones and Behaviour.	3
PSYC 410	Special Topics in Neuropsychology.	3
PSYC 470	Memory and Brain.	3
PSYC 455		3
PSYT 500	Advances: Neurobiology of Mental Disorders.	3

Available Programs

- Biology - Cell/Molecular Minor Concentration (B.A. & Sc.) (19 credits)
- Biology - Organismal Minor Concentration (B.A. & Sc.) (19 credits)
- Biology Major Concentration (B.A. & Sc.) (36 credits)

Location

Faculty of Science
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Montreal QC H3A 1B1
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