Bachelor of Science - Biology 2022 - 23

MOUNT ROYAL UNIVERSITY
Faculty of Science and Technology

✓	YEAR ONE - Fall	✓	YEAR ONE - Winter
	BIOL 1202 - Introduction to Cell Biology		BIOL 1204 - Evolution of Eukaryotes
	CHEM 1201- General Chemistry: Structure and Bonding		CHEM 1202 - General Chemistry: Introduction to Quantitative Chemistry
	MATH 1200 - Calculus for Scientists I		PHYS 1202 - Classical Physics II
	PHYS 1201 - Classical Physics I		GNED Foundation Cluster 2: one of GNED 1201, 1202, or 1203
	GNED Foundation Cluster 1: one of GNED 1101 or 1103		GNED Foundation Cluster 4: one of GNED 1401, 1403 or 1404

Many courses are prerequisites for upper year courses. Check prerequisites and scheduling at https://catalog.mtroyal.ca

✓	YEAR TWO - complete the following courses*
	BIOL 2101 - Genetics - *Fall*
	CHEM 2101 - Organic Chemistry I - *Fall*
	BIOL 2202 - Cellular and Molecular Biology - *Winter*
	BCEM 2201 - General Biochemistry - *Winter*
	BIOL 2105 - Microbiology I - *Winter*
	BIOL 2110 - Comparative Vertebrate Anatomy & Physiology
	BIOL 2213 - Principles of Ecology & Evolution
	MATH 2233 - Statistics for Biological Sciences
	Biology Ethics - one of: PHIL 2223, PHIL 2229, PHIL 2291, GEOG 2445, or INST 3740 *(or BIOL 2203**)*
	GNED Foundation Cluster 3: one of GNED 1301, 1303, or 1304

*The *Fall/Winter* notations indicate when you should be planning to take core courses. Certain core courses may have prerequisites that need to be completed in a particular sequence to avoid delays in graduation. **In addition, most senior courses are only offered once per year.** If there is no notation, this course should be completed in year two but may be offered in either semester. It is your responsibility to plan your schedule and make sure that you are meeting necessary requirements. Consider consulting your advisor if you are uncertain or require clarification.

**Students planning to pursue the Anatomy & Physiology concentration (see pg.2) should take BIOL 2203 in their second year of study to ensure the necessary prerequisites for BIOL 3104/3205/3204 in third year. In this case, the Ethics requirement can be completed in 3rd year or on.

YEAR THREE - complete the following courses

✓	CORE course requirements:	✓	General Education and Electives:
	BIOL 3401 - Big Questions and Big Data in Biology		GNED Tier 2 Cluster 2: _____
	Concentration Course 1/Approved Option		GNED Tier 2 Cluster 3: _____
	Concentration Course 2/Approved Option		GNED Tier 2 Cluster 4: _____
	Concentration Course 3/Approved Option		Elective course:
	Concentration Course 4/Approved Option		Elective course:

Be sure you are checking prerequisites and scheduling at https://catalog.mtroyal.ca

YEAR FOUR - complete the following courses

✓	CORE course requirements:	✓	General Education and Electives:
	Concentration Course 5/Approved Option:		GNED Tier 3 (Cluster ___):
	Concentration Course 6/Approved Option:		GNED Tier 3 (Cluster ___):
	Concentration Course 7/Approved Option:		GNED Tier 3 (Cluster ___):
	Concentration Course 8/Approved Option:		Elective course:
	One of: BIOL 5203, 5208, or 5301		Elective course:

Approved Option courses and Concentration courses are listed on page 2.
Take two Tier 3 courses from a minimum of two different clusters, take the third Tier 3 course from any cluster.

PLEASE READ:

Prerequisites and course descriptions can be found in the Academic Calendar under the *courses* link at https://catalog.mtroyal.ca

Planning your major: In addition to the core courses listed on the program planning guide, choose one area of concentration, OR an additional eight (8) Approved Options (AO), detailed on pg. 2 of this guide.

General Education: General Education approved courses, otherwise known as "GNED requirements" are designed to give you a well-rounded knowledge base and are organized into 4 thematic clusters. Each Cluster has three levels: tier 1 (foundation), tier 2 and tier 3.

Cluster 1: Numeracy & Scientific Literacy
Cluster 2: Values, beliefs & Identity
Cluster 3: Community & Society
Cluster 4: Communication

Students must take a foundation level from each of the four clusters, three tier 2 GNEDs (one from each of cluster 2, 3, and 4), and a total of three tier 3 GNEDs from at least two clusters, for a total of 10 GNED courses. Visit mru.ca/gned for more information and a list of GNED courses.

Junior courses are courses at the 1000 level. Students are allowed a maximum of 16 junior courses for graduation purposes.

Electives are *any* 3-credit course. It is advised that students in this major select senior level electives wherever possible to avoid exceeding the 16 junior course limit.

Advising Plan: This guide will allow you to complete your degree in four years provided you complete five courses per semester and attain the necessary required grade (C-) in your prerequisites. To be considered full time, a student must be enrolled in a minimum of three, three-credit courses.

Please make note that core third and fourth year courses are normally offered only *once per year* and should be noted if a reduced course load is being considered.

Students should check the Spring/Summer course listings in March when the schedule of classes is released to determine what offerings *may be* available for Spring/Summer. (Spring/Summer terms are 6.5 weeks in duration and are considered optional).

This document is only intended to be a guide for students and should be used together with the Mount Royal University Academic Calendar which states academic policies and degree requirements. Be sure to consult with your Academic Advisor to confirm graduation requirements or if you have any questions at scitechadvising@mtroyal.ca

In addition to the core courses listed on the program planning guide (pg 1), declare an area of concentration OR choose eight (8) Approved Options (AO) from the list below. When planning your courses review prerequisite requirements (https://catalog.mtroyal.ca) and verify when courses may be offered. All courses are subject to availability. ***Please note: most senior courses are only offered once per year.***

Concentration 1: Cellular Molecular Biology (8 courses):
Required courses:
BIOL 3101 - Molecular Genetics
BIOL 3102 - Cell Dynamics and Signaling
BIOL 3105 - Microbiology II
BIOL 3203 - Genomes
BIOL 4101 - Advanced Cellular Molecular Biology I
BIOL 4202 - Advanced Cellular Molecular Biology II
BCEM 3201 - Protein Biochemistry
1 Biology Approved Option

Concentration 2: Ecology & Evolution (8 courses):
Required courses:
BIOL 3106 - Evolutionary Biology
BIOL 3108 - Conservation Biology
BIOL 3301 - Animal Behaviour
BIOL 4310 - Molecular Ecology
BIOL 4320 - Field Biology Research Techniques
BIOL 4401 - Population and Conservation Genetics
2 Biology Approved Options

Concentration 3: Anatomy & Physiology (8 courses):
Required courses:
Choose ***six*** courses from:
BIOL 2203 - Human Anatomy
BIOL 3104 - Human Physiology I
BIOL 3105 - Microbiology II
BIOL 3110 - Comparative Vertebrate Biomechanics
BIOL 3204 - Histology
BIOL 3205 - Human Physiology II
BIOL 4102 – Pathophysiology: Mechanisms of Disease
BIOL 4207 – Womb-to-Tomb: Embryology, Development, and Aging
BIOL 4209 - Neuroscience
BIOL 4210 - Sensorimotor Physiology
BIOL 4211 - Applied Human Physiology
Choose 2 Biology Approved Options

OR Choose eight Approved Options (AO):
BIOL 2203 - Human Anatomy
BIOL 2214 - Invertebrate Zoology
BIOL 3101 - Molecular Genetics
BIOL 3102 - Cell Dynamics and Signaling
BIOL 3104 - Human Physiology I
BIOL 3105 - Microbiology II
BIOL 3106 - Evolutionary Biology
BIOL 3108 - Conservation Biology
BIOL 3110 - Comparative Vertebrate Biomechanics
BIOL 3201 - Common Ground: Learning from the Land
BIOL 3203 - Genomes
BIOL 3204 - Histology
BIOL 3205 - Human Physiology II
BIOL 3301 - Animal Behaviour
BIOL 4101 - Advanced Cellular Molecular Biology I
BIOL 4102 – Pathophysiology: Mechanisms of Disease
BIOL 4202 - Advanced Cellular Molecular Biology II
BIOL 4207 – Womb-to-Tomb: Embryology, Development, and Aging
BIOL 4209 - Neuroscience
BIOL 4210 - Sensorimotor Physiology
BIOL 4211 - Applied Human Physiology
BIOL 3299 or 4299 - Directed Readings (only one can count for graduation)
BIOL 4310 - Molecular Ecology
BIOL 4320 - Field Biology Research Techniques
BIOL 4401 - Population and Conservation Genetics
BIOL 5201 - Independent Projects I
BIOL 5202 - Independent Projects II
BCEM 3201 - Protein Biochemistry
BCEM 3202 - Enzymes & Metabolic Systems
COMP 2001 - Computer Based Problem Solving for the Sciences
GEOG 2553 - Geographic Information Systems
GEOG 3553 - Spatial Analysis and GIS

Approved Options Restrictions:
- Maximum of two courses at 2000-level.
- Maximum of two non BIOL-prefixed courses.
- Minimum of two courses at the 4000-level or higher.