

# Bachelor of Science: Biology 2024/25

✓ 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	GNEC Foundation Cluster 2: one of GNEC 1201, 1202, or 1203
GNEC Foundation Cluster 1: one of GNEC 1101 or 1103	GNEC Foundation Cluster 4: one of GNEC 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 - <i>Fall</i>
CHEM 2101 - Organic Chemistry I - <i>Fall</i>
BIOL 2202 - Cellular and Molecular Biology - <i>Winter</i>
BCEM 2201 - General Biochemistry - <i>Winter</i>
BIOL 2105 - Microbiology I - <i>Winter</i>
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 ( <i>please see note re: BIOL 2203**</i> )
GNEC Foundation Cluster 3: one of GNEC 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 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 3<sup>rd</sup> year or on.**

YEAR THREE - complete the following courses	
✓ <b>CORE course requirements:</b>	✓ <b>General Education and Electives:</b>
BIOL 3401 - Big Questions & Big Data	GNEC Tier 2 Cluster 2: _____
Concentration Course/Approved Option	GNEC Tier 2 Cluster 3: _____
Concentration Course/Approved Option	GNEC Tier 2 Cluster 4: _____
Concentration Course/Approved Option	Elective course:
Concentration Course/Approved Option	Elective course:

Be sure you are checking prerequisites and scheduling at <https://catalog.mtroyal.ca>  
*Approved Option courses and Concentration courses are listed on page 2.*

YEAR FOUR - complete the following courses	
✓ <b>CORE course requirements:</b>	✓ <b>General Education and Electives:</b>
Concentration Course/Approved Option:	GNEC Tier 3 (Cluster ____):
Concentration Course/Approved Option:	GNEC Tier 3 (Cluster ____):
Concentration Course/Approved Option:	GNEC Tier 3 (Cluster ____):
Concentration Course/Approved Option:	Elective course:
Capstone, one of: BIOL 5203, 5208, or 5301 - <i>Winter</i>	Elective course:

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 eight (8) Approved Options (AO), detailed on pg. 2 of this guide.

**General Education:** General Education approved courses, otherwise known as "GNEC 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 GNECs (one from each of cluster 2, 3, and 4), and a total of three tier 3 GNECs from at least two clusters, for a total of 10 GNEC courses. Visit [mru.ca/gned](http://mru.ca/gned) for more information and a list of GNEC courses.

**Junior courses** are courses at the 1000 level. 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.

**Please note: most senior courses are only offered once per year, some alternate years - keep this in mind when planning, particularly when completing a reduced course load.**

**It is your responsibility to plan your schedule, ensure you meet prerequisites, and graduation requirements. If you require a reduced course load please consult your advisor for guidance when planning.**

This document is only intended to be a guide for students and should be cross-referenced with the current Mount Royal University Academic Calendar which states academic policies and degree requirements. This can change yearly and improve to allow for more options and new courses. Be sure to consult with your Academic Advisor to confirm these changes, graduation requirements, or if you have any questions at [scitechadvising@mtroyal.ca](mailto:scitechadvising@mtroyal.ca)

**Declare an area of concentration OR choose eight (8) Approved Options (AO) from the list below.**

When planning your courses review descriptions & prerequisite requirements (<https://catalog.mtroyal.ca>). All courses are subject to changes, availability, and scheduling, all of which can vary by semester and year.

**TIP: confirm the prerequisites for the capstone courses (one of BIOL 5203, 5208, or 5301 – last year, Winter) early on, and prepare accordingly, working backwards.**

**Please note:** most senior courses are only offered once per year, some alternate years, subject to changes

**Choose one Concentration:**

**Anatomy & Physiology (8 courses):**

Required courses:

BIOL 2203 - Human Anatomy <sup>2ND YEAR\*\*</sup>

BIOL 3104 - Human Physiology I <sup>FALL</sup>

BIOL 3204 - Histology

BIOL 3205 - Human Physiology II <sup>WINTER</sup>

Choose 2 of the following:

BIOL 3105 - Microbiology II

BIOL 3110 - Comparative Vertebrate Biomechanics

BIOL 4102 - Pathophysiology: Mechanisms of Disease

BIOL 4207 - Womb to Tomb: Embryology, Development & Aging <sup>FALL</sup>

BIOL 4209 - Neuroscience

BIOL 4210 - Sensorimotor Physiology

BIOL 4211 - Applied Human Physiology

BIOL 4212 – Human Metabolism

Choose 2 Approved Options ->

**Cellular Molecular Biology (8 courses):**

Required courses:

BIOL 3101 - Molecular Genetics <sup>FALL</sup>

BIOL 3102 - Cell Dynamics and Signaling <sup>WINTER</sup>

BIOL 4101 - Advanced Cellular Molecular Biology I <sup>FALL</sup>

BIOL 4202 - Advanced Cellular Molecular Biology II <sup>WINTER</sup>

2 Approved Options ->

2 of the following:

BIOL 3105 - Microbiology II

BIOL 3203 - Genomes

BCEM 3201 - Protein Biochemistry

**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 & Conservation Genetics

2 Approved Options ->

**OR Choose 8 Approved Options (AO):**

BIOL 2203 - Human Anatomy <sup>2ND YEAR\*\*</sup>

BIOL 2214 - Invertebrate Zoology

BIOL 3101 - Molecular Genetics <sup>FALL</sup>

BIOL 3102 - Cell Dynamics and Signaling <sup>WINTER</sup>

BIOL 3104 - Human Physiology I <sup>FALL</sup>

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 <sup>WINTER</sup>

BIOL 3301 - Animal Behaviour

BIOL 3299 or 4299 - Directed Readings (only one can count for graduation)

BIOL 4101 - Advanced Cellular & Molecular Biology I <sup>FALL</sup>

BIOL 4102 - Pathophysiology: Mechanisms of Disease

BIOL 4202 - Advanced Cellular & Molecular Biology II <sup>WINTER</sup>

BIOL 4207 - Womb to Tomb: Embryology, Development & Aging <sup>FALL</sup>

BIOL 4209 - Neuroscience

BIOL 4210 - Sensorimotor Physiology

BIOL 4211 - Applied Human Physiology

BIOL 4212 – Human Metabolism

BIOL 4310 - Molecular Ecology

BIOL 4320 - Field Biology Research Techniques

BIOL 4330 - Special Topics in Ecology and Evolution

BIOL 4401 - Population & Conservation Genetics

BIOL 4740 – Scientific Writing & Communication in Biology

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

GEOG 2553 - Geographic Information Systems

GEOG 3553 - Spatial Analysis & GIS

**Approved Option 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**

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