

# Bachelor of Science - Biology 2021 - 22

✓ 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 at <http://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
One of: PHIL 2223, PHIL 2229, PHIL 2291, GEOG 2445, or INST 3740
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, some courses are only offered in one semester. 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.

YEAR THREE - complete the following courses	
✓ <b>CORE course requirements:</b>	✓ <b>General Education and Electives:</b>
BIOL 3401 - Big Questions and Big Data in Biology	GNEC Tier 2 Cluster 2: _____
Concentration Course 1/Approved Option	GNEC Tier 2 Cluster 3: _____
Concentration Course 2/Approved Option	GNEC Tier 2 Cluster 4: _____
Concentration Course 3/Approved Option	Elective course:
Concentration Course 4/Approved Option	Elective course:

As you plan your courses be sure you are checking prerequisites at <http://catalog.mtroyal.ca/>

YEAR FOUR - complete the following courses	
✓ <b>CORE course requirements:</b>	✓ <b>General Education and Electives:</b>
Concentration Course 5/Approved Option:	GNEC Tier 3 (Cluster ____):
Concentration Course 6/Approved Option:	GNEC Tier 3 (Cluster ____):
Concentration Course 7/Approved Option:	GNEC 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 "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. 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 limits.

**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).

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.

**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 CMB I  
BIOL 4202 - Advanced CMB II  
BCEM 3201 - Protein Biochemistry  
1 Biology Approved Option

**Concentration 2: Ecology and Evolution (8 courses):**

Required courses:

BIOL 3106 - Evolutionary Biology  
BIOL 3108 - Conservation Biology  
BIOL 3301 - Animal Behaviour  
BIOL 4310 - Molecular Ecology  
BIOL 4401 - Population and Conservation Genetics  
BIOL 4xxx - Field Biology  
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 3204 - Histology  
BIOL 3205 - Human Physiology II  
BIOL 4102 - Pathophysiology  
BIOL 4207 - Embryology  
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 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 CMB I  
BIOL 4102 - Pathophysiology  
BIOL 4202 - Advanced CMB II  
BIOL 4207 - Embryology  
BIOL 4209 - Neuroscience  
BIOL 4210 - Sensorimotor Physiology  
BIOL 4211 - Applied Human Physiology  
BIOL 3299/4299 - Directed Readings  
BIOL 4310 - Molecular Ecology  
BIOL 4401 - Population and Conservation Genetics  
BIOL 5201 - Independent Studies I  
BIOL 5202 - Independent Studies II  
BCEM 3201 - Protein Biochemistry  
BCEM 3202 - Enzymes & Metabolic Systems  
GEOG 2553 - Geographic Information Systems  
GEOG 3553 - Spatial Analysis and GIS  
COMP 2001 - Comp. Based Problem Solving for the Sciences

**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.