

Molecular and Cellular Biotechnology

This focal area equips students with the scientific knowledge and skills necessary to innovate, develop, and effectively communicate marketable biotechnology solutions across diverse industries. It may be of interest if you are considering careers involving:

- Biotechnology and Bioinformatics
- Knowledge Translation and Technical Consulting
- Regulatory Affairs and Policy Analysis
- Product Research and Development

Please note:

- **Inclusion on this list does not guarantee enrolment in courses that have Priority Access or other restrictions in place**
- This guidance document provides an optional framework for tailoring your electives to your career interests and professional goals
- You are responsible for selecting courses that meet degree requirements for the BIOS major
- Verify admission requirements for any further education programs you're considering

A) Foundations

Common prerequisites for courses in this focal area, and/or relevant to all areas of application listed:

CIS*1500 Introduction to Programming
MCB*2050 Molecular Biology of the Cell
MICR*2420 Introduction to Microbiology
MICR*2430 Methods in Microbial Culture and Physiology
BIOC*3560 Structure and Function in Biochemistry
BIOL*3300 Applied Bioinformatics
MBG*3350 Laboratory Methods in Molecular Biology
MBG*3660 Genomics

B) Areas of Application

Agriculture and Animal Science

AGR*2470 Intro to Plant Agriculture
ENVS*2060 Soil Science
MBG*2400 Fundamentals of Plant and Animal Genetics
MBG*3060 Quantitative Genetics
ANSC*4050 Biotechnology in Animal Science
BIOM*4110 Mammalian Reproductive Biology
MBG*4160 Plant Breeding
PBIO*4750 Genetic Engineering of Plants

Conservation and Ecosystem Health

BIOL*2060 Ecology
BOT*2100 Life Strategies of Plants
ENVS*2080 Intro. Environmental Microbiology
BIOL*3040 Methods in Evolutionary Biology
BIOL*3130 Conservation Biology
PBIO*3750 Plant Tissue Culture
PBIO*4530 Plants & Environmental Pollution
MBG*4300 Plant Molecular Genetics

Nutrition and Food Science


FOOD*2620 Food Engineering Principles
FOOD*3240 Food Microbiology
HORT*3270 Medicinal Plants
NUTR*3210 Fundamentals of Nutrition
NUTR*3360 Lifestyle Genomics
NUTR*4090 Functional Foods & Nutraceuticals
NUTR*4360 Current Issues in Nutrigenomics
NUTR*4510 Toxicology, Nutrition & Food

Pharmacology and Biomedicine

CHEM*2700 Organic Chemistry I
TOX*2000 Principles of Toxicology
BIOM*3090 Principles of Pharmacology
MBG*3040 Molecular Biology of the Gene
MICR*3230 Immunology
BIOC*4050 Protein and Nucleic Acid Structure
BIOM*4090 Pharmacology
MBG*4240 Applied Molecular Genetics in Medicine and Biotechnology

C) Liberal Education and Transferable Skills




Additional skills and knowledge to help you market biotech innovations, navigate regulatory processes, engage in ethical research and development, and collaborate effectively.

- The BSc program and BIOS major include a limit on the number of 1000 level and non-science credits that can count toward the degree. See the [Academic Calendar](#) listing for full details
- DNA symbol () marks approved science electives. These courses may not be counted toward the Liberal Education degree requirement

Business and Management

MCS*1000 Introductory Marketing
HROB*2010 Foundations of Leadership
MGMT*2150 Introduction to Canadian Business Management
MGMT*3300 Project Management

Interpersonal Skills, Professional Relationships, and Communication

ENGL*1030 Effective Writing
BIOL*3660 Internship in Biological Science 
BIOL*4020 Integrative Problems in Biological Science 
HK*4510/11/12 Teaching, Learning, and Knowledge Transfer 

Public Policy and Economics

ECON*1050 Introductory Microeconomics
ECON*1100 Introductory Macroeconomics
POLS*2230 Public Policy
POLS*2250 Public Administration and Governance

Science, Ethics, and Technology

HIST*1250 Science & Technology in a Global Context
PHIL*2180 Philosophy of Science
PHIL*3450 Ethics in the Life Sciences
UNIV*2010 Anti-Discrimination & Anti-Oppression