

BIOTECHNOLOGY, B.SC. MAJOR

Degree Requirements

Joint Four Year Major (Including Co-operative Option if Selected)

Note: As of Fall 2018, admission to the Biotechnology programs has been temporarily suspended. For further information, see the Faculty of Science office.

Offered Jointly by the Departments of Chemistry and Microbiology

Course	Title	Hours
Year 1		
BIOL 1020	Biology 1: Principles and Themes (C)	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties (C+)	3
CHEM 1120	Introduction to Chemical Techniques (C)	3
PHYS 1020 or PHYS 1050	General Physics 1 or Physics 1: Mechanics	3
MATH 1500	Introduction to Calculus ¹	3
STAT 1000	Basic Statistical Analysis 1	3
Hours		24
Years 1-2		
6 credit hours from the Faculty of Arts including the required "W" course		6
Hours		6
Year 2		
CHEM 2100	Organic Chemistry 1: Foundations of Organic Chemistry	3
CHEM 2110	Organic Chemistry 2: Foundations of Organic Synthesis	3
CHEM 2122	Experimental Organic Chemistry	3
CHEM/MBIO 2700	Biochemistry 1: Biomolecules and an Introduction to Metabolic Energy	3
CHEM/MBIO 2710	Biochemistry 2: Catabolism, Synthesis, and Information Pathways	3
CHEM 2720	Principles and Practices of the Modern Biochemistry Laboratory	3
CHEM 2510	Introduction to Analytical Chemistry	3
MBIO 1010	Microbiology I	3
MBIO 2020	Microbiology II	3
BIOL 2520	Cell Biology	3
Hours		30
Year 3		
CHEM 2520	Introduction to Analytical Chemistry Techniques	2
CHEM 3500	Instrumental Analysis	3
MBIO 3000	Applied Biological Safety	3

MBIO 3032	Microbiology III: Physiology and Metabolism	3
MBIO 3410	Molecular Biology	3
MBIO 3700	Experimental Microbiology Laboratory	3

Work Terms (if Co-op Selected):

SCI 3980	Co-operative Education Work Term 1	0
SCI 3990	Co-operative Education Work Term 2	0
Hours		17

Years 3-4

CHEM 3760	Advanced Methods for the Biochemistry Laboratory	4
9 credit hours of Optional Courses ²		9
15 credit hours of Required Program Stream Courses ²		15
9 credit hours of electives ³		9
Hours		37

Year 4

CHEM 4630	Biochemistry of Proteins	3
MBIO 4520	Industrial Bioprocesses	3

Work Terms (if Co-op Selected):

SCI 4980	Co-operative Education Work Term 3	0
SCI 4990	Co-operative Education Work Term 4 (if a 4th work term is selected)	0
Hours		6
Total Hours		120

¹ MATH 1230, MATH 1510 or MATH 1520 may be used in place of MATH 1500.

² Optional courses and program stream courses requirements can be found in course lists below.

³ Refer to list of recommended elective courses below prior to registration in your electives.

(Letters in brackets indicate minimum prerequisite standing for further study.)

Common Core Courses:

BIOL 2520, CHEM 2100, CHEM 2110, CHEM 2122, CHEM 2700/MBIO 2700, CHEM 2710/MBIO 2710, CHEM 2720, CHEM 2510, CHEM 2520, CHEM 3500, CHEM 3760, CHEM 4630, MBIO 1010, MBIO 2020, MBIO 3000, MBIO 3032, MBIO 3410, MBIO 3700, MBIO 4520

Optional Courses:

Appropriate prerequisites must be taken for all Optional courses.

CHEM 3520, CHEM 3700, CHEM 4360, CHEM 4670, MBIO 3430, MBIO 4020, MBIO 4410, MBIO 4440, BIOL 3300, BIOL 4554/BIOL 4556, BIOL 4540, BIOL 4560, PLNT 2530, PLNT 4610, COMP 3820

Program Stream Courses:

Analytical Biotechnology:

MATH 1700¹, CHEM 4370, CHEM 4590, CHEM 4670, CHEM 4700

¹ MATH 1232 or MATH 1710 may be used in place of MATH 1700.

Molecular Biotechnology:

BIOL 4544 or BIOL 4556, MBIO 3600, MBIO 4602, MBIO 4612, MBIO 4672

Note: In some instances prerequisites will be waived upon approval by the appropriate department.

Recommended General Electives if not required in Program stream:

Appropriate prerequisites must also be taken for all Electives.

BIOE 3200, BIOE 3530, BIOE 4510; BIOL 1300 (BOTN 1010), BIOL 2242 (BOTN 2010), BIOL 2380 (BOTN 2180/ZOOL 2180), BIOL 2260 (BOTN 2210), BIOL 2300 (BOTN 2370/ZOOL 2370), BIOL 3550 (BOTN 3190), BIOL 3290 (BOTN 3280), BIOL 3500 (BOTN 3460), BIOL 4500 (BOTN 4180), BIOL 3542 (BIOL 2540), BIOL 4540 (ZOOL 4150), BIOL 4544 (BIOL 3540); CHEM 4360, CHEM 4370, CHEM 4590, CHEM 4620, CHEM 4670, CHEM 4700; COMP 1010, COMP 1020, COMP 1260, COMP 1270; ENG 1420; ENTR 2020; MATH 1700¹; MBIO 3282, MBIO 3010, MBIO 3430, MBIO 4440 (MBIO 3440), MBIO 3450, MBIO 3460, MBIO 3472, MBIO 4480 (MBIO 3480), MBIO 4010, MBIO 4410, MBIO 4470, MBIO 4602, MBIO 4612, MBIO 4672; PHAC 4030, PHAC 4040; PHIL 2740, PHIL 2830; PLNT 3140, PLNT 3500, PLNT 3520, PLNT 3570, PLNT 4310, PLNT 4330, PLNT 4550, PLNT 4560, PLNT 4570, PLNT 4580, PLNT 4590, PLNT 4600; STAT 2000

¹ MATH 1232 or MATH 1710 may be used in place of MATH 1700.

Other suitable courses may be selected through consultation with the department heads