GENETICS, B.SC. MAJOR

Degree Requirements

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

Course	Title	Hours
Year 1		
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 Chemistry Techniques [1]	3
BIOL 1020	Biology 1: Principles and Themes	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions (C+)	3
One of:		3
STAT 1150	Introduction to Statistics and Computing [2]	
STAT 1000	Basic Statistical Analysis 1 [2]	
MATH 1500	Introduction to Calculus [3]	3
One of:		3
MATH 1240	Elementary Discrete Mathematics [3]	
MATH 1300	Vector Geometry and Linear Algebra [3]	
MATH 1700	Calculus 2 [3]	
	Hours	**24**
Years 1-2		
3 credit hours from the Faculty of Arts		3
3 credit hour "W" course		3
3 credit hours of electives		3
	Hours	**9**
Year 2		
BIOL 2500	Genetics 1	3
BIOL 2520	Cell Biology	3
CHEM 2100	Organic Chemistry 1: Foundations of 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
MBIO 1010	Microbiology I	3
MBIO 2020	Microbiology II	3
One of:		3
STAT 2150	Statistics and Computing [2]	
STAT 2000	Basic Statistical Analysis 2 [2]	
	Hours	**27**
Years 3-4		
BIOL 3500	Genetics 2	3
MBIO 3410	Molecular Biology	3
PLNT 3140	Introductory Cytogenetics	3
BGEN 3022	Introduction to Human Genetics A	3
BGEN 3024	Introduction to Human Genetics B	3
One of:		3
ANTH 2240	Plagues and People	
ANTH 2560	Anthropology of Illness	
ANTH 2860	Evolution and Human Diversity	
ANTH 2890	Human Population Biology	
30 credit hours from list of optional courses (a minimum of 15 of these credit hours must be 4000 level)		30
12 credit hours of electives		12
Co-op Requirements (if selected): [4]		
SCI 3980	Co-operative Education Work Term 1	0
SCI 3990	Co-operative Education Work Term 2	0
SCI 4980	Co-operative Education Work Term 3	0
SCI 4990	Co-operative Education Work Term 4	0
	Hours	**60**
	Total Hours	**120**

1 CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120. CHEM 1122 and CHEM 1126 are restricted to Price Faculty of Engineering Students.

2 STAT 1150 is recommended over STAT 1000; STAT 2150 is recommended over STAT 2000.

3
- MATH 1210, MATH 1220, or MATH 1310 may be taken in place of MATH 1300;
- MATH 1230, MATH 1510, the former MATH 1520, or MATH 1524 may be taken in place of MATH 1500;
- MATH 1232 or MATH 1710 may be taken in place of MATH 1700;
- MATH 1200 may be taken in place of MATH 1240.

4 Students in the Co-operative Option are advised to ensure that they are able to satisfy the prerequisites for all 3000 and 4000 level courses they plan to take.

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

Optional Courses for the Genetics Honours and Major Programs (Including Co-operative Options)

Biochemistry and Medical Genetics

Course	Title	Hours
BGEN 4010	Project Course in Human Genetics [1]	6

1 MBIO 4530 and BGEN 4010 are project courses. A research project is chosen in consultation with the Microbiology department (MBIO 4530) or Biochemistry and Medical Genetics (BGEN 4010) and the Genetics program committee, and is supervised by a staff member. Only one of MBIO 4530 or BGEN 4010 may be selected in this program. These are required courses for students registered in the Genetics Honours program and may be available to students registered in the Genetics Major program by departmental consent.

Biological Sciences

Course	Title	Hours
BIOL 2410	Human Physiology 1	3
BIOL 2420	Human Physiology 2	3
BIOL 3290	Medicinal and Hallucinogenic Plants	3
BIOL 3300	Evolutionary Biology	3
BIOL/PLNT 3400	Plant Physiology	3
BIOL 3542	Developmental Biology	3

BIOL 3560	Comparative Animal Histology	3
BIOL 4500	Molecular Genetics of Plant Development	3
BIOL 4510	Evolutionary Genetics	3
BIOL 4540	Developmental Molecular Biology	3
BIOL 4542	Genes and Development	3
BIOL 4560	Microtechnique	3
BIOL 4650	Biology and Society	3

Chemistry

Course	Title	Hours
CHEM 2110	Organic Chemistry 2: Foundations of Organic Synthesis	3
CHEM 2122	Experimental Organic Chemistry	3
CHEM 2600	Physical Chemistry 1	3
CHEM 3600	Physical Chemistry 2	3
CHEM 4360	Signalling and Regulation of Gene Expression	3
CHEM 4370	Glycobiology and Protein Activation	3
CHEM 4620	Biochemistry of Nucleic Acids	3
CHEM 4630	Biochemistry of Proteins	3

Microbiology

Course	Title	Hours
MBIO 2420	Introductory Virology	3
MBIO 3000	Applied Biological Safety	3
MBIO 3010	Mechanisms of Microbial Disease	3
MBIO 3032	Microbiology III: Physiology and Metabolism	3
MBIO 3430	Molecular Evolution	3
MBIO 3450	Regulation of Biochemical Processes	3
MBIO 3460	Membrane and Cellular Biochemistry	3
MBIO 4020	Immunology	3
MBIO 4410	Virology	3
MBIO 4530	Project in Microbiology [1]	6
MBIO 4540	Biological Energy Transduction	3
MBIO 4602	Molecular Genetics of Prokaryotes - Lectures	3
MBIO 4612	Molecular Genetics of Eukaryotes - Lectures	3
MBIO 4672	Applied Molecular Biology	3

[1] MBIO 4530 and BGEN 4010 are project courses. A research project is chosen in consultation with the Microbiology department (MBIO 4530) or Biochemistry and Medical Genetics (BGEN 4010) and the Genetics program committee, and is supervised by a staff member. Only one of MBIO 4530 or BGEN 4010 may be selected in this program. These are required courses for students registered in the Genetics Honours program and may be available to students registered in the Genetics Major program by departmental consent.

Computer Science

Course	Title	Hours
COMP 1010	Introductory Computer Science 1	3
COMP 1020	Introductory Computer Science 2	3
COMP 1500	Computing: Ideas and Innovation	3
COMP 1600	Navigating Your Digital World	3

Physics

Course	Title	Hours
PHYS 1020	General Physics 1	3
PHYS 1030	General Physics 2	3
PHYS 1050	Physics 1: Mechanics	3
PHYS 1070	Physics 2: Waves and Modern Physics	3

Animal Science

Course	Title	Hours
ANSC 3500	Principles of Animal Genetics	3
ANSC 4280	Applied Animal Genetics	3

Pharmacology

Course	Title	Hours
PHAC 4030	Drugs in Human Disease I	3
PHAC 4040	Drugs in Human Disease II	3

Plant Science

Course	Title	Hours
PLNT 2530	Plant Biotechnology	3
PLNT/BIOL 3400	Plant Physiology	3
PLNT 3520	Principles of Plant Improvement	3
PLNT 4330	Intermediate Plant Genetics	3
PLNT 4610	Bioinformatics	3

By an appropriate selection of courses from this list, students can obtain particular program emphasis in either plant, human or molecular genetics.

The Honours Co-op program must contain a minimum of 18 credit hours of 4000 level courses as options in Years 3 and 4.

Other suitable optional courses may be arranged through consultation with the Genetics program committee.