

MAJOR AND HONOURS IN BIOLOGY

(Updated 10 February 2011)

www.mun.ca/biology/undergrad/

Note 1: This is advisory only. All degree requirements are as specified in the University Calendar. It is your responsibility to ensure you are following the specific requirements as described in the Calendar.

Note 2: Each Biology major is assigned a faculty advisor who should be consulted on academic problems, including course selection

Note 3: Enrollment in many Biology courses is limited and admission is determined by academic average (GPA).

Note 4: Biology 2040, 2041, 2120 and 3053 cannot be used as any of the required Biology courses for the Minor, Major or Honours programs in Biology.

1. GENERAL DEGREE - Major - Biology; Cell and Molecular Biology; Ecology and Conservation Biology; Marine Biology

Admission: Admission to the Biology majors program is competitive and is based on academic standing. Students wishing to major in Biology should submit an "Application for Admission to Biology majors Program" form to the Biology Department by June 1st for the Fall Semester and October 1st for the Winter Semester. To be admitted to the program, students must have completed **Biology 1001/1002 with an average of at least 65%**. In addition, students are expected to have a minimum **overall average of 60% in six other specified first-year courses** (two English, two Chemistry or Physics, two Mathematics - if Math 1000 only has been done, any other first year course may be used in the average of six).

Course Requirements: A General Degree with any Major in Biology requires 40 courses:

2 English courses (1080 and 1110 or 1101, 1102, 1103)

15 Biology courses (see specific major for details)

10 non-Biology required science courses (Chem* 1010/1011 or 1050/1051; Chem 2440;

Phys** 1020/1021 or 1050/1051; Math *** 1090/1000;

Biochem 2101 and 3106; Stats 2550)

1 Science elective (for a B.Sc. 26 courses must be in science)

12 General electives (may include additional Biology courses)

40 TOTAL

NB One or more of the organism courses (Biol 2122, 2210 and 2010) are **key prerequisites to many 3000 and 4000 level Biology courses and it is recommended that at least one be completed in second year.**

*Chemistry 1010/1011 (or 1050/1051) are **essential for timely progress and should be taken in first year.** They are prerequisite to Organic Chemistry (2440) in second year, which in turn is prerequisite or corequisite to Biology 2250, prerequisite to Biology 2060, prerequisite to Biochemistry 2101 etc.

**Physics 1021 (or 1051) is prerequisite or corequisite to Biology 2060 which is normally taken in the fourth semester.

***If only Math 1000 is done, an additional science course is needed to make up the required 26 science courses.

Minor for Biology Majors: The general degree programme also permits a student to have a minor in another Department's program. Some examples include Psychology, Earth Science, Biochemistry, History, English, Mathematics.

2. HONOURS IN BIOLOGY

Admission: Biology majors with a good academic record (i.e., a 'B' or better in each Biology course beyond first year or a 75% average in Biology courses) at the beginning of their third year (i.e., at the start of their fifth semester) may elect to do a B.Sc. (Honours). Students who wish to apply for the honours program must submit an "Application for Admission to Honours Program Faculty of Arts or Science" form to the Registrar's Office.

Read the more detailed "Information About Biology Honours" before you apply. This can be obtained from the office of the Biology Department.

Course requirements: An honours degree in Biology requires 40 courses:

2 English courses (1080 and 1110 or 1101, 1102, 1103)
7 Biology core courses (1001, 1002, 2060, 2250, 2600, 2900 and one of 3401, 3402, 4245 or 4404)
2 Honours dissertation (499A/499B)
14 Biology electives (2000*, 3000 and 4000 level)
10 non-Biology required science courses (Chem** 1010/1011 or 1050/1051; Chem 2440; Phys*** 1020/1021 or 1050/1051; Math**** 1090/1000; Biochem 2101 and 3106; Stats 2550)
5 General electives (may include additional Biology courses)
40 TOTAL

*One or more of the organism courses (Biol 2122, 2210 and 2010) **are key prerequisites to many 3000 and 4000 level courses and it is recommended that at least one be completed in second year.**

Chemistry 1010 and 1011 (or 1050 and 1051) are **essential for timely progress and should be taken in the first year. They are prerequisite to Organic Chemistry (2440) in second year, which is in turn prerequisite or corequisite to Biology 2250, prerequisite to Biology 2060, prerequisite to Biochemistry 2101 etc.

***Physics 1021 (or 1051) is prerequisite or corequisite to Biology 2060 which is normally taken in the fourth semester.

****If only Math 1000 is done, you will have an additional general elective.

Minor for Honours students: You are unable to receive a Minor in many subjects (e.g. French, Anthropology, History) because of the low number of general electives available in the program. To receive a Minor in another subject, students must be able to complete the required 8 courses within the 40 courses required for the degree. If you exceed the 40 course requirement, it simply will be noted on your transcript that you have completed the requirements for a minor in that subject. For subjects such as Biochemistry, some courses required for the Biology degree may be used toward the minor.

Recommended Course Schedules

Note 1: These recommendations are based on 5 courses for each Fall and Winter Semester and allow you to complete the Major or Honours in Biology in 4 years. You may choose to do some courses in the Spring Semester (if they are offered) and or to extend you program over 5 years.

Note 2: These schedules are **advisory only**; it is the responsibility of the student to follow all University and Departmental regulations as set out in the Calendar.

NB:

It is essential to plan your program. You should list all the courses you want to do; check all of the prerequisites that you need; draw up a four year schedule and discuss it with your Faculty Advisor.

RECOMMENDED COURSE SCHEDULE FOR BIOLOGY MAJORS

FALL

WINTER

First Year

Engl 1080
Math 1090 or 1000
Biol 1000 (1st Year Biology)
Chem 1010/1050
Physics 1020/1050 or General elective

Engl 1110
Math 1000 or elective
Biol 1002 (1st Year Biology)
Chem 1011/1051
Physics 1021/1051 or General elective

Second Year

Biol 2600 (Ecology)
Biol 2250 (Genetics)
Chem 2440
Stats 2550
General elective or Physics 1020/1050

Biol 2060 (Cell)
Biol 2900 (Evolution)
Biol 2210¹ (Verts) **or** Biol 2010¹ (Botany)
or Biol elective
Biochem 2101
General elective or Physics 1021/1051

Third Year

Biochem 3106
Biol 2122¹ (Inverts) or Biol elective
Biol 3401² (Anim. Phys) **or** **4245**² (Biophys)
or Biol elective
2 General electives

Biol 3402² (Plant Phys) **or** **4404**² (Micro Phys)
or Biol elective
Science elective
Biol 2010¹ (Botany) **or** Biol elective
2 General electives

Fourth Year

Biol 3401² (Anim. Phys) **or** **4245**² (Biophys)
or Biol elective
Biol elective
3 General elective

Biol 3402² (Plant Phys) **or** **4404**² (Micro. Phys)
or Biol elective
Biol elective
3 General electives

¹ One or more of the organism courses (Biol. 2122, 2210 and 2010) are **key prerequisites to many 3000 and 4000 level Biology courses and it is recommended that at least one be completed in second year.**

²**At least one core physiology must be completed in the 3rd or 4th year. Biol. 3401 and 4245 are generally offered in the Fall Semester; Biol 3402 and 4404 are generally offered in the Winter Semester.**

NOTE: If you have not completed the 2nd year core by the end of your fourth semester of university there may be other possible schedules, such as that provided below, that should enable you to complete your program in a timely manner. Please consult with your Faculty Advisor.

FALL

WINTER

First Year

Engl 1080
Math 1090 or 1000
Biol 1000 (1st Year Biology)
Chem 1010/1050
Physics 1020/1050 or General elective

Engl 1110
Math 1000 or elective
Biol 1002 (1st Year Biology)
Chem 1011/1051
Physics 1021/1051 or General elective

Second Year

Biol 2600 (Ecology)
Biol 2122¹ (Inverts) or Biol elective
Chem 2440
Stats 2550
General elective or Physics 1020/1050

Biol 2210¹ (Verts) or 2010¹ (Botany) or Biol elective
Biochem 2101
Biol elective
General elective
General elective or Physics 1021/1051

Third Year

Biol 2250 (Genetics)
Biochem 3106
Biol 2122¹ (Inverts) or other Biol elective
Biol elective or Science elective
General elective

Biol 2060 (Cell)
Biol 2900 (Evolution)
Biol 2010¹ (Botany) or Biol elective or Sci. elective
2 General electives

Fourth Year

Biol 3401² (Anim Phys) or **Biol 4245**² (Biophys)
or Biol elective
Biol elective
3 General electives

Biol 3402² (Plant Phys.) or **4404**² (Micro. Phys.)
or Biol elective
Biol elective
3 General electives

¹ One or more of the organism courses (Biol 2122, 2210 and 2010) are **key prerequisites to many 3000 and 4000 level Biology courses and it is recommended that at least one be completed in second year.**

² **At least one core physiology must be completed in the 3rd or 4th year. Biol 3401 and 4245 are generally offered in the Fall Semester; Biol. 3402 and 4404 are generally offered in the Winter Semester.**

RECOMMENDED COURSE SCHEDULE FOR CELL AND MOLECULAR BIOLOGY MAJOR

FALL

WINTER

First Year

Engl 1080
Math 1090 or 1000
Biol 1001 (1st Year Biology)
Chem 1010/1050
Physics 1020/1050 or General elective

Engl 1110
Math 1000 or elective
Biol 1002 (1st Year Biology)
Chem 1011/1051
Physics 1021/1051 or General elective

Second Year

Biol 2600 (Ecology)
Biol 2250 (Genetics)
Chem 2440
Stats 2550
General elective or Physics 1020/1050

Biochem 2101
Biol 2060 (Cell)
Biol 2210¹ (Verts) or 2010¹ (Botany) or other Biol
elective
Biol 2900 (Evolution)
General elective or Physics 1021/1051

Third Year

Biochem 3106
Biol 2122¹ (Inverts) or other Biol elective³
Biol 3401² (Anim. Phys) or **4245**² (Biophys)
or Biol elective
2 General electives

Biol 3530
Biol 4241
Biol 3402² (Plant Phys) or **4404**² (Micro. Phys)
or **Biol recc**³
2 General electives

Fourth Year

Biol 3401² (Anim. Phys) or **4245**² (Biophys)
or Biol elective
Biol recc.³
3 General electives³

Biol 3402² (Plant Phys) or **4404**² (Micro Phys)
or Biol electives³
Science electives
3 General electives

¹ One or more of the organism courses (Biology 2122, 2210 and 2010) are **key prerequisites to many 3000 and 4000 level Biology courses and it is recommended that at least one be completed in second year.**

² **At least one core physiology must be completed in the 3rd or 4th year. Biology 3401 and 4245 are generally offered in the Fall Semester; Biol. 3402 and 4404 are generally offered in the Winter Semester.**

³ **Biology courses recommended for Cell and Molecular Biology must take at least TWO from this list: 3050, 3401, 3402, 3500, 3620, 3950, 4010, 4040, 4200, 4245, 4250, 4251, 4255, 4404, 4550, 4605**

RECOMMENDED COURSE SCHEDULE FOR ECOLOGY & CONSERVATION BIOLOGY MAJOR

FALL

WINTER

First Year

Engl 1080
Math 1090 or 1000
Biol 1001 (1st Year Biology)
Chem 1010/1050
Physics 1020/1050 or General elective

Engl 1110
Math 1000 or elective
Biol 1002 (1st Year Biology)
Chem 1011/1051
Physics 1021/1051 or General elective

Second Year

Biol 2600 (Ecology)
Biol 2250 (Genetics)
Chem 2440
Stats 2550
General elective or Physics 1020/1050

Biochem 2101
Biol 2060 (Cell)
Biol 2210¹ (Verts) or 2010¹ (Botany) or other Biol
elective⁴
Biol 2900 (Evolution)
General elective or Physics 1021/1051

Third Year

Biochem 3106
Biol 2122¹ (Inverts) or other Biol elective⁴
or **Biol 3401**² (Anim. Phys) or **4245**² (Biophys)
Biol 3295 (Biol recc.)³
2 General electives

Biol 4650
Biol 3402² (Plant Phys) or **4404**² (Micro. Phys)
or Biol elective⁴
or **Biol recc.**
Science elective
2 General electives

Fourth Year

Biol 3401² (Anim. Phys) or **4245**² (Biophys)
or Biol elective
Biol electives⁴
3 General electives

Biol 4651
Biol 3402² (Plant Phys) or **4404**² (Micro. Phys)
or Biol electives⁴
3 General electives

¹ One or more of the organism courses (Biol 2122, 2210 and 2010) are **key prerequisites to many 3000 and 4000 level Biology courses and it is recommended that at least one be completed in second year.**

² **At least one core physiology must be completed in the 3rd or 4th year. Biol 3401 and 4245 are generally offered in the Fall Semester; Biol 3402 and 4404 are generally offered in the Winter Semester.**

³ 3295 is one of the prerequisites for 4651

⁴ **Biology courses recommended for Ecology and Conservation must take at least two from this list.**

3041, 3050, 3295, 3300, 3610, 3620, 3640, 3709, 3710, 3711, 3714, 3715, 4040, 4141, 4180, 4182
4306, 4307, 4360, 4405, 4505, 4605, 4620, 4630, 4701, 4710, 4750, 4810

RECOMMENDED COURSE SCHEDULE FOR MARINE BIOLOGY MAJOR

FALL

WINTER

First Year

Engl. 1080
Math 1090 or 1000
Biol 1001 (1st Year Biology)
Chem 1010/1050
Physics 1020/1050

Engl 1110
Math 1000 or elective
Biol 1002 (1st Year Biology)
Chem 1011/1051
Physics 1021/1051

Second Year

Biol 2600 (Ecology)
Biol 2250 (Genetics)
Biol 2122 (Biol elective)
Chem 2440
Stats 2550

Biochem 2101
Biol 2060 (Cell)
Biol 2210¹ (Verts) **or** Biol 2010¹ (Botany) **or** other
Biol elective
Biol 2900 (Evolution)
General elective

Third Year

Biochem 3106
Biol 3710
Biol 3711 or
Biol 3401² (Anim Phys) **or** **4245**² (Biophys)
2 General electives

Biol 3402² (Plant Phys) **or** **4404**² (Micro Phys.)
or Biol recc.³
Biology elective³
3 General electives

Fourth Year

Biol 3401² (Anim Phys) **or** **4245**² (Biophys)
or Biol recc.³
Biol 3711 or Biol elective
3 General electives

Biol 3402² (Plant Phys) **or** **4404**² (Micro Phys.)
or Biol elective³
Science elective
3 General electives

¹ One or more of the organism courses (Biol 2122, 2210 and 2010) are **key prerequisites to many 3000 and 4000 level Biology courses and it is recommended that at least one be completed in second year.**

² **At least one core physiology must be completed in the 3rd or 4th year. Biol 3401 and 4245 are generally offered in the Fall Semester; Biol 3402 and 4404 are generally offered in the Winter Semester.**

³ **Biology courses recommended for Marine Biology, must take at least two from this list.**

3050, 3620, 3640, 3709, 3712, 3714, 3715, 4014, 4122, 4141, 4182, 4601, 4605, 4620, 4630, 4710, 4750, 4810, 4912

NB. Five of the recommended courses for Marine Biology can be completed during a Spring Semester at Bonne Bay Field Station. See <http://www.bonnebay.ca/undergraduates.htm>

Course Number, Name and Prerequisite List (updated October 6)

In order to graduate in a timely fashion, it is necessary to plan the schedule of courses so you have the necessary prerequisites to complete all of the courses you plan to take.

Note: * = the course may be taken as a corequisite.

KEY: BC = Biochemistry; C = Chemistry; ES = Earth Science; M = Math; S = Statistics ; CS = Computer Science

Number	Name	Prerequisites
1001	First Year	
1002	First Year	1001
2010	Biology of Plants	1001, 1002, C1010 or 1050
2060	Principles of Cell Biology	1001, 1002, 2250, C2440 or 2400, P1021 or 1051*, BC2101*
2122	Biology of Invertebrates	1001, 1002
2210	Biology of Vertebrates	1001, 1002
2250	Principles of Genetics	1001, 1002, C1010/1011 or 1050/1051, C2440 or 2400*
2600	Principles of Ecology	1001, 1002
2900	Principles of Evolution	1001, 1002, 2250, S2550 or equivalent*
3050	Microbiology	1001, 1002, BC. 2101
3052	Food Microbiology	3050
3202	Comp. Vertebrate. Anatomy	1001, 1002
3295	Population &. Evol. Ecol.	2600, one of 2010, 2122 or 2210
3300	Introductory Entomology	2600
3401	Animal Physiology	2060, 2210, BC3106*
3402	Principles of Plant Physiology	2060, 2010, BC3106*
3500	Histology	2060, 2210
3530	Molecular & Developmental Bio.	2060, 2250 or BC2100
3610	Boreal Ecol.	2010, 2250, 2600, 2900, S2550 or equivalent
3640	Environmental Physiology of Animals	2060, 2210, BC 3106
3709	Field Marine Princ. & Techniques	2600, S2550 or equivalent
3710	Biological Oceanography	2122, 2600
3711	Principles of Marine Biology	2122, 2600
3712	Benthic Biology	2122, 2600
3714	Estuarine Fish Ecol	2600
3715	Ecology & Evolution of Fishes	2210, 2600, 2900
3750	Anim. Behaviour I	1001, 1002, S2550 or equivalent
3811	Paleontology	2122 & 2210
3950	Res. Methods in Genetic Biotechnology	2060, 2250 or BC2100
3951	Introduction to Bioinformatics	2060 or BC 2101, CS course excluding 1600,2000
4010	Virology	2900, 3050
4012	Phycology	2060, 2600
4014	Boreal & Arctic Seaweeds	2600 or equivalent
4040	Mycology	2060, 3050
4050	Advanced Topics in Microbiology	3050
4122	Advanced Topics in Marine Invertebrates	2122, 2600, 2900
4141	Nematology	2010,2122, 2600
4180	General Parasitology	2122, 2210, 2600
4182	Fish Wildlife Parasitology	4180
4200	Immunology	2060, 3050
4241	Advanced Genetics	2250, BC2101
4245	Biophysics	2060, BC2101
4250	Evolutionary Genetics	2250, 2900
4251	Genomics	2060; 2250
4255	Proteomics	2060, 2250, BC3106
4306	Applied Biol.	2060, 2250, 2600, 2900, one of 2010, 2122, 2210
4307	Global Change Biology	2600, 2900
4360	Community & Ecosystem Ecol.	2250, 2600, 2900, one of 2010, 2122, 2210, S2550 or equivalent
4404	Microbial Physiology	2250, 3050
4405	Landscape Ecology	2600, 18 credit hrs in Biology, S 2550 or equivalent*
4505	Syst. & Biogeography	2250, 2600, 2900, one of 2010, 2122, 2210
4550	Endocrinology	3401, BC3106
4601	Functional Biol. Fish	2060, 2210, 3401

4605	Quantitative Methods	S2550 or equivalent
4620	Ornithology	2210, 2600
4630	Mammalogy	2210, 2600
4650	Conservation Biology I: Cons in Bio.&Geog	21 credit hrs in Biology or 30 credit hrs in Geography
4651	Conservation Biology II: Conservation in Practice	2900, 3295, 4650
4701	Anim. Behaviour II	3750
4710	Experimental Marine Ecology of Nfld. Waters	2600
4750	Fish Ecology	2600
4800	Adv. Paleontology	3811 & one of S2510, S2550 or M2000
4810	Research Field course in Marine Biol.	3710 & two of 2010, 2122 or 2210
4820	Field Terrestrial	2010, 2122, 2210, 2600
4910	Vertebrate Diversity and Adaptation	2210
4911	Applied Biology	2 nd yr. Biology Core
4912	Marine Mammals	30 credit hrs. in Biology