

## Specialization in Zoology

### First year

BIOL 1506 Biology I  
 BIOL 1507 Biology II  
 CHMI 1006 General Chemistry I <sup>1</sup>  
 CHMI 1007 General Chemistry II  
 MATH 1036 Calculus I <sup>2</sup>

MATH 1037 Calculus II *or*  
 MATH1057 Linear Algebra I

PHYS 1006 Introductory Physics I *or*  
 PHYS 1206 Physics for Life Sciences I (recommended)

PHYS 1007 Introductory Physics II *or*  
 PHYS 1207 Physics for Life Sciences II (recommended)

*+ 6 credits in Social Sciences and/or Humanities*

### Second year

BIOL 2007 Genetics  
 BIOL 2026 Introduction to Microbiology  
 BIOL 2126 Cell Biology  
 BIOL 2356 Principles of Ecology  
 BIOL 2706 Vertebrate Form and Function  
 BIOL 2706 Vertebrate Form and Function  
 BIOL 2726 Diversity of Animals  
 CHMI 2426 Organic Chemistry I  
 STAT 2126 Introduction to Statistics *or*  
 STAT 2246 Statistics for Scientists  
*+ 6 credits in Social Sciences and/or Humanities*

### Third year

BIOL 3327 Experimental Methods  
 CHMI 2227 Biochemistry I  
*+ 12 credits from Zoology List A below*  
*+ 6 credits from Zoology List B below* <sup>3</sup>  
*+ 6 credits from any discipline*

### Fourth year

BIOL 4016 Field Camp and Report *or* equivalent <sup>4</sup>  
 BIOL 4035 Research and Seminar <sup>5</sup>  
*+ 9 credits from Zoology List A below*  
*+ 6 credits from Zoology List B below*  
*+ 6 credits from any discipline*

**Zoology List A**<sup>6</sup>

BIOL 2306 Diversity of Plants  
 BIOL 3006 Evolutionary Biology  
 BIOL 3706 General Entomology  
 BIOL 3726 Animal Histology  
 BIOL 3746 Animal Ecology  
 BIOL 3756 Vertebrate Physiology  
 BIOL 4717 Animal Behaviour  
 BIOL 4736 Developmental Biology  
 BIOL 4797 Environmental Physiology

**Zoology List B**<sup>3</sup>

BIOL 2757 Biological Aspects of Human Sexuality  
 BIOL 3117 Infectious Diseases  
 BIOL 3306 Vascular Plant Systematics  
 BIOL 3386 Mycology  
 BIOL 3807 Applied Entomology  
 BIOL 3977 Biodiversity and Conservation  
 BIOL 4066 Quantitative Ecology  
 BIOL 4216 Ontario University Program in Field Biology I  
 BIOL 4217 Ontario University Program in Field Biology II  
 BIOL 4346 Medical Mycology  
 BIOL 4747 Herpetology  
 BIOL 4756 Freshwater Biology  
 BIOL 4777 Wildlife Management  
 BIOL 4807 Advanced Genetics  
 BIOL 4907 Fisheries Science for Stressed Ecosystems  
 CHMI 2427 Organic Chemistry II  
 CHMI 3226 Biochemistry II  
 GEOL 2406 Paleobiology I  
 INTE 3107 Pathophysiology  
 PHIL 2215 Environmental Ethics

<sup>1</sup> Applicants lacking 12U-level Chemistry or the equivalent must complete CHMI 1041 prior to taking CMI 1006.

<sup>2</sup> Applicants with a grade of less than 60% in 12U-level Calculus or the equivalent must complete MATH 1912 prior to taking MATH 1036.

<sup>3</sup> Courses in List B are those recommended for specialization in Zoology. Students may substitute these credits for other third or fourth-year science courses in consultation with their academic advisor.

<sup>4</sup> Students must consult their academic advisor for a suitable replacement for BIOL 4016. BIOL 4216 may be a suitable replacement. BIOL 4016 (or its equivalent) can be taken in third year.

<sup>5</sup> A minimum average of 75% is required in all Biology courses, otherwise students must take BIOL 4017 and another senior Biology course (additional 3 credits from List A or B).

<sup>6</sup> Students must take at least 21 credits from List A in third and fourth years. Some courses are offered only every second year. Consult with your specialization advisor. Any remaining course can replace a course in Zoology List B.

## Specialization in Ecology

### First year

BIOL 1506 Biology I  
 BIOL 1507 Biology II  
 CHMI 1006 General Chemistry I <sup>1</sup>  
 CHMI 1007 General Chemistry II  
 MATH 1036 Calculus I <sup>2</sup>

MATH 1037 Calculus II *or*  
 MATH 1057 Linear Algebra I

PHYS 1006 Introductory Physics I *or*  
 PHYS 1206 Physics for Life Sciences I (recommended)

PHYS 1007 Introductory Physics II *or*  
 PHYS 1207 Physics for Life Sciences II (recommended)

*+ 6 credits in Social Sciences and Humanities*

### Second year

BIOL 2007 Genetics  
 BIOL 2026 Introduction to Microbiology  
 BIOL 2126 Cell Biology  
 BIOL 2306 Diversity of Plants  
 BIOL 2726 Diversity of Animals  
 BIOL 2356 Principles of Ecology  
 CHMI 2426 Organic Chemistry I  
 STAT 2126 Introduction to Statistics *or*  
 STAT 2246 Statistics for Scientists  
*+ 6 credits in Social Sciences or Humanities*

### Third year

BIOL 3327 Experimental Methods in Biology  
*+ 15 credits from Ecology List A below*  
*+ 15 credits from Ecology List B below*  
*+ 6 credits from any discipline*

### Fourth year

BIOL 4016 Field Camp and Report *or* equivalent <sup>3</sup>  
 BIOL 4035 Research and Seminar <sup>4</sup>  
*+ 15 credits among the Ecology List A below*  
*+ 15 credits among the Ecology List B below*  
*+ 6 credits from any discipline*

**Ecology List A**<sup>5</sup>

BIOL 2706 Vertebrate Form and Function  
 BIOL 3006 Evolutionary Biology  
 BIOL 3306 Vascular Plant Systematics  
 BIOL 3316 Plant Form and Function  
 BIOL 3317 Plant Ecophysiology  
 BIOL 3336 Plant Ecology  
 BIOL 3706 General Entomology  
 BIOL 3746 Animal Ecology  
 BIOL 3756 Vertebrate Physiology<sup>6</sup>  
 BIOL 4756 Freshwater Biology  
 CHMI 2227 Biochemistry I

**Ecology List B**<sup>5</sup>

BIOL 3026 Applied and Environmental Microbiology  
 BIOL 3056 Mineral Exploitation and the Biosphere  
 BIOL 3067 Winter Ecology  
 BIOL 3346 Ethnobotany  
 BIOL 3376 Restoration Ecology I: Concepts and Principles  
 BIOL 3386 Mycology  
 BIOL 3807 Applied Entomology  
 BIOL 3927 Forest Entomology  
 BIOL 3977 Biodiversity and Conservation  
 BIOL 4056 General Limnology  
 BIOL 4066 Quantitative Ecology  
 BIOL 4216 Ontario University Program in Field Biology I  
 BIOL 4217 Ontario University Program in Field Biology II  
 BIOL 4316 Advanced Plant Ecophysiology  
 BIOL 4336 Plant Geography  
 BIOL 4366 Soil Biology  
 BIOL 4376 Biology of Liverworts, Mosses and Lichens  
 BIOL 4386 Wetland Ecology and Conservation  
 BIOL 4717 Animal Behaviour  
 BIOL 4747 Herpetology  
 BIOL 4777 Wildlife Management  
 BIOL 4797 Environmental Physiology  
 BIOL 4807 Advanced Genetics  
 BIOL 4907 Fisheries Science for Stressed Ecosystems  
 GEOL 2406 Paleobiology I  
 PHIL 2215 Environment Ethics

<sup>1</sup> Applicants lacking 12U-level Chemistry or the equivalent must complete CHMI 1041 prior to taking CHMI 1006.

<sup>2</sup> Applicants with a grade of less than 60% in 12U-level Calculus or the equivalent must complete MATH 1912 prior to taking MATH 1036.

<sup>3</sup> Students must consult their academic advisor for a suitable replacement for BIOL 4016.

<sup>4</sup> A minimum average of 75% is required in all Biology courses, otherwise students must take BIOL 4017 (Literature Review - 3 credits) and another senior biology course (additional 3 credits from List A or B).

<sup>5</sup> Students must take at least 24 credits of the 33 credits on List A in third and fourth year. Some courses are offered only every second year. Consult with your specialization advisor. Any remaining course can

*replace a course in Ecology List B.*

<sup>6</sup> *Students must take BIOL 2105, BIOL 2706 or an equivalent course before taking BIOL 3756 or obtain permission from the instructor.*

## Specialization in Restoration Biology

### First year

BIOL 1506 Biology I  
 BIOL 1507 Biology II  
 CHMI 1006 General Chemistry I <sup>1</sup>  
 CHMI 1007 General Chemistry II  
 MATH 1036 Calculus I <sup>2</sup>

MATH 1037 Calculus II *or*  
 MATH1057 Linear Algebra I

PHYS 1006 Introductory Physics I *or*  
 PHYS 1206 Physics for Life Sciences I (recommended)

PHYS 1007 Introductory Physics II *or*  
 PHYS 1207 Physics for Life Sciences II (recommended)

*+ 6 credits in Social Sciences and Humanities*

### Second year

BIOL 2007 Genetics  
 BIOL 2026 Introduction to Microbiology  
 BIOL 2126 Cell Biology  
 BIOL 2306 Diversity of Plants  
 BIOL 2306 Diversity of Plants  
 BIOL 2356 Principles of Ecology  
 BIOL 2726 Diversity of Animals  
 CHMI 2426 Organic Chemistry I  
 STAT 2126 Introduction to Statistics *or*  
 STAT 2246 Statistics for Scientists  
*+ 6 credits in Social Sciences and Humanities*

### Third year

BIOL 3327 Experimental Methods in Biology  
 BIOL 3376 Restoration Ecology  
*+ 15 credits from Restoration Biology List A below*  
*+ 3 credits from Restoration Biology List B below*  
*+ 6 credits from any discipline*

### Fourth year

BIOL 4006 Field Internship and Report *or*  
 BIOL 4016 Field Camp and Report *or* equivalent <sup>3</sup>  
 BIOL 4035 Research and Seminar <sup>4</sup>  
*+ 6 credits from Restoration Biology List A below*  
*+ 9 credits from Restoration Biology List B below*  
*+ 6 credits from any discipline*

**Restoration Biology List A**<sup>5</sup>

BIOL 3026 Applied and Environmental Microbiology  
 BIOL 3306 Vascular Plant Systematics  
 BIOL 3336 Plant Ecology  
 BIOL 3746 Animal Ecology  
 BIOL 3977 Biodiversity and Conservation  
 BIOL 4756 Freshwater Biology  
 CHMI 2227 Biochemistry I  
 CHMI 2316 Inorganic Chemistry I  
 ENVI 3136 Hydrology  
 GEOL 3397 Introduction to Soil Science

**Restoration Biology List B**

BIOL 3006 Evolutionary Biology  
 BIOL 3056 Mineral Exploitation and the Biosphere  
 BIOL 3067 Winter Ecology  
 BIOL 3316 Plant Form and Function  
 BIOL 3317 Plant Ecophysiology  
 BIOL 3386 Mycology  
 BIOL 3706 General Entomology  
 BIOL 3927 Forest Entomology  
 BIOL 4056 General Limnology  
 BIOL 4066 Quantitative Ecology  
 BIOL 4216 Ontario University Program in Field Biology I  
 BIOL 4217 Ontario University Program in Field Biology II  
 BIOL 4316 Advanced Plant Ecophysiology  
 BIOL 4336 Plant Geography  
 BIOL 4366 Soil Biology  
 BIOL 4376 Biology of Liverworts, Mosses and Lichens  
 BIOL 4386 Wetland Ecology and Conservation  
 BIOL 4396 Current Issues in Environmental Sustainability  
 BIOL 4747 Herpetology  
 BIOL 4777 Wildlife Management  
 BIOL 4907 Fisheries Science for Stressed Ecosystems  
 CHMI 3326 Aquatic Chemistry  
 GEOG 3036 Air Photo Interpretation  
 GEOG 3037 Remote Sensing of the Environment  
 GEOG 4056 Introduction to GIS  
 PHIL 2215 Environmental Ethics

<sup>1</sup> Applicants lacking 12U-level Chemistry or the equivalent must complete CHMI 1041 prior to taking CMI 1006.

<sup>2</sup> Applicants with a grade of less than 60% in 12U-level Calculus or the equivalent must complete MATH 1912 prior to taking MATH 1036.

<sup>3</sup> Students must consult their academic advisor for a suitable replacement for BIOL 4006 or BIOL 4016. BIOL 4216 may be a suitable replacement.

<sup>4</sup> A minimum average of 75% is required in all Biology courses, otherwise students must take BIOL 4017 (Literature Review - 3 credits) and another senior Biology course (additional 3 credits from List A or B).

<sup>5</sup> Students must take at least 21 credits of the 27 credits on List A in third and fourth year. Some courses are offered only every second year. Consult with your specialization advisor. Any remaining course can replace a course in Restoration Biology List B.

## Specialization in Biomedical Biology

### First year

BIOL 1506 Biology I  
 BIOL 1507 Biology II  
 CHMI 1006 General Chemistry I+  
 CHMI 1007 General Chemistry II  
 MATH 1036 Calculus I++

MATH 1037 Calculus II *or*  
 MATH1057 Linear Algebra I

PHYS 1006 Introductory Physics I *or*  
 PHYS 1206 Physics for Life Sciences I (recommended)

PHYS 1007 Introductory Physics II *or*  
 PHYS 1207 Physics for Life Sciences II (recommended)

ANTR 1006/1007 Introduction to Anthropology I/II *or*  
 PSYC 1105 Introduction to Psychology

*+ Students lacking 12U-level Chemistry or the equivalent must complete CHMI 1041 prior to taking CHMI 1006.*

*++ Students with a grade of less than 60% in 12U-level Calculus or the equivalent must complete MATH 1912 prior to taking MATH 1036.*

### Second year

BIOL 2007 Genetics  
 BIOL 2026 Introduction to Microbiology  
 BIOL 2105 Human Anatomy and Physiology  
 BIOL 2126 Cell Biology *or*  
 BIOL 3726 Animal Histology\*  
 BIOL 2706 Vertebrate Form and Function  
 CHMI 2426 Organic Chemistry I  
 CHMI 2427 Organic Chemistry II  
 CHMI 2227 Biochemistry I  
 STAT 2126 Introduction to Statistics *or*  
 STAT 2246 Statistics for Science

### Third year

BIOL 3117 Infectious Diseases  
 BIOL 3327 Experimental Methods in Biology  
 BIOL 2126 Cell Biology\* *or*  
 BIOL 3726 Animal Histology\*  
 CHMI 3226 Biochemistry II  
*+ 6 credits from Biomedical List\**  
*+ 6 credits from the Social Sciences or Humanities*  
*+ 6 credits from any discipline*



#### Fourth year

27 credits from the Biomedical List\*  
 + 3 credits from any discipline

#### Biomedical List

BIOL 2726 Diversity of Animals  
 BIOL 2757 Biological Aspects of Human Sexuality  
 BIOL 3026 Applied and Environmental Microbiology  
 BIOL 3346 Ethnobotany  
 BIOL 3386 Mycology  
 BIOL 3756 Vertebrate Physiology  
 BIOL 4017 Literature Review  
 BIOL 4035 Research and Seminar  
 BIOL 4717 Animal Behaviour  
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 BIOL 4717 Animal Behaviour  
 BIOL 4736 Developmental Biology  
 BIOL 4797 Environmental Physiology\*\*\*  
 BIOL 4807 Advanced Genetics\*\*\*  
 ANTR 2016 Human Biological Variation, Adaptations and Health\*\*  
 ANTR 2017 Human Evolution\*\*  
 ANTR 3036 Human Skeletal Biology\*\*, \*\*\*\*  
 ANTR 3046 Human Ecology and Palaeoecology\*\*  
 ANTR 3047 Public Health and Epidemiology\*\*  
 ANTR 3086 Medical Anthropology: Medicine, Culture and Society\*\*  
 ANTR 3087 Ethnomedicine: Cross-Cultural Healing\*\*  
 ANTR 4006 Food and Disease Prevention\*\*  
 ANTR 4007 Origins of Sickness and Medicine\*\*  
 CHMI 2031 Natural Products: Organic and Biochemical Features\*\*\*  
 CHMI 3206 Applied Bioinformatics\*\*\*  
 CHMI 3427 Introduction to Medicinal Chemistry  
 CHMI 4216 Biochemistry of Nucleic Acids  
 CHMI 4217 Biomembranes, Structure and Function  
 CHMI 4226 Recombinant DNA Technology\*\*\*  
 CHMI 4227 Recombinant DNA Technology II\*\*\*  
 CHMI 4287 Biochemical Toxicology\*\*\*  
 CHMI 4297 Biochemistry of the Immune System  
 CHMI 4486 Advanced Medicinal Chemistry  
 FORS 3036 Forensic Anatomy of Human Skeleton \*\*\*\*  
 PHYS 2606 Biophysics of Fluids  
 PHYS 2616 Physics of Hearing and Vision  
 PHYS 3306 Radiobiology and Radiation Protection  
 PHYS 3616 Use of Lasers and Fiber Optics in Health Sciences  
 PHYS 3626 Radiation Biophysics and Physics of Medical Imaging  
 PSYC 2606 Brain and Behaviour\*\*\*  
 PSYC 2617 Human Neuropsychology\*\*\*  
 PSYC 3506 Neuropharmacology\*\*\*  
 PSYC 3507 Behavioural Neurobiology\*\*\*

*\* Certain core courses and senior-level courses are offered on alternate years. These courses must be chosen in consultation with the Academic Advisor. As such, the timetables of the respective departments must be consulted to identify each year's course offerings.*

*\*\* to a maximum of 12 ANTR credits in third and fourth years*

*\*\*\* In consultation with the Academic Advisor*

*\*\*\*\* Either ANTR 3036 or FORS 3036 (but not both) can be taken.*

## General Biology 3-year B.Sc.

### First year

BIOL 1506 Biology I  
 BIOL 1507 Biology II  
 CHMI 1006 General Chemistry I <sup>1</sup>  
 CHMI 1007 General Chemistry II  
 MATH 1036 Calculus I <sup>2</sup>

MATH 1037 Calculus II *or*  
 MATH 1057 Linear Algebra I

PHYS 1006 Introductory Physics I *or*  
 PHYS 1206 Physics for Life Sciences I (recommended)

PHYS 1007 Introductory Physics II *or*  
 PHYS 1207 Physics for Life Sciences II (recommended)

*+ 6 credits in Social Sciences and Humanities*

### Second year

BIOL 2007 Genetics  
 BIOL 2026 Introduction to Microbiology  
 BIOL 2126 Cell Biology  
 BIOL 2356 Principles of Ecology  
 CHMI 2227 Biochemistry I  
 CHMI 2426 Organic Chemistry I  
 STAT 2126 Introduction to Statistics

*+ 3 cr. among*

BIOL 2306 Diversity of Plants  
 BIOL 2706 Vertebrate Form and Function  
 BIOL 2726 Diversity of Animals  
 CHMI 2427 Organic Chemistry II <sup>3</sup>  
*+ 6 credits in Social Sciences and Humanities*

### Third year

*24 cr. from among <sup>5,6</sup>*

BIOL 2105 Human Anatomy and Physiology  
 BIOL 2306 Diversity of Plants <sup>5</sup>  
 BIOL 2726 Diversity of Animals <sup>5</sup>  
 BIOL 2757 Biological Aspects of Human Sexuality  
 BIOL 3006 Evolutionary Biology  
 BIOL 3026 Applied and Environmental Microbiology  
 BIOL 3056 Mineral Exploitation and the Biosphere  
 BIOL 3067 Winter Ecology  
 BIOL 3117 Infectious Diseases  
 BIOL 3306 Vascular Plant Systematics  
 BIOL 3316 Plant Form and Function  
 BIOL 3317 Plant Ecophysiology

BIOL 3327 Experimental Methods in Biology  
 BIOL 3336 Plant Ecology  
 BIOL 3346 Ethnobotany  
 BIOL 3376 Restoration Ecology  
 BIOL 3386 Mycology  
 BIOL 3706 General Entomology  
 BIOL 3726 Animal Histology  
 BIOL 3746 Animal Ecology  
 BIOL 3746 Animal Ecology  
 BIOL 3756 Vertebrate Physiology  
 BIOL 3807 Applied Entomology  
 BIOL 3927 Forest Entomology  
 BIOL 3977 Biodiversity and Conservation  
 CHMI 3226 Biochemistry II <sup>4</sup>

*+ 6 credits from any discipline*

<sup>1</sup> *Applicants lacking 12U-level Chemistry or the equivalent must complete CHMI 1041 prior to taking CHMI 1006.*

<sup>2</sup> *Applicants with a grade of less than 60% in 12U-level Calculus or the equivalent must complete MATH 1912 prior to taking MATH 1036.*

<sup>3</sup> *Students who intend to take CHMI 3226 in third year must complete CHMI 2427 and CHMI 2227.*

<sup>4</sup> *Students who have not completed CHMI 2427 complete 3 additional BIOL credits instead of CHMI 3226.*

<sup>5</sup> *Students must include BIOL 2726 and BIOL 2306 if not taken already.*

<sup>6</sup> *Certain 4th-year courses may also be taken in consultation with the Academic Advisor.*

## Major in Biology

### Required courses (6 cr):

*Mandatory courses for all students:*

BIOL 1506 Biology I

BIOL 1507 Biology II

### Elective courses (36 cr):

The courses must be taken in sequence with respect to pre-requisites. Several 3<sup>rd</sup> and 4<sup>th</sup>-year courses are not offered

every year, and it is recommended to contact the Academic Advisor for course selection.

*12 credits among the following 2nd-year courses:*

BIOL 2007 Genetics

BIOL 2026 Introduction to Microbiology

BIOL 2126 Cell Biology

BIOL 2356 Principles of Ecology

BIOL 2306 Diversity of Plants **OR**

BIOL 2726 Diversity of Animals

*+ 15 BIOL credits from 3000 and 4000-level courses (may not include BIOL 4016 and BIOL 4035)*

*+ 9 additional BIOL credits*

**Total:** 42 Biology credits

## Minor in Biology

### Required courses (6 cr):

*Mandatory courses for all students:*

BIOL 1506 Biology I

BIOL 1507 Biology II

### Elective courses (18 cr):

The courses must be taken in sequence with respect to pre-requisites. Several 3<sup>rd</sup> and 4<sup>th</sup>-year courses are not offered

every year, and it is recommended to contact the Academic Advisor for course selection.

*12 credits from among the following 2<sup>nd</sup>-year courses:*

BIOL 2007 Genetics

BIOL 2026 Introduction to Microbiology

BIOL 2105 Human Anatomy and Physiology

BIOL 2126 Cell Biology

BIOL 2306 Diversity of Plants

BIOL 2356 Principles of Ecology

BIOL 2706 Vertebrate Form and Function

BIOL 2726 Diversity of Animals

+ 6 BIOL credits from 3000 and 4000-level courses (may not include BIOL 3067, BIOL 4016 and BIOL 4035)

Total: 24 Biology credits