

## CONCENTRATIONS IN BIOLOGY 2018-19

For Advanced Majors and Honours students, we offer six areas of concentration, health sciences, ecology, cell and molecular biology, animal biology, plant biology and aquatic biology.

A concentration is included in a student's official academic record and appears on any transcript issued.

Students must complete at least 15 credits of the designated 300 & 400 level courses, including at least 3 credits at the 400 level, from the selected concentration.

"Health biology" designated courses provide a broad education in biology while introducing concepts and techniques appropriate for those interested in post graduate programs such as medicine, dentistry, veterinary science, pharmacy, audiology, optometry, occupational therapy, physiotherapy, speech pathology. Students are responsible for ensuring course selection fulfills any course requirements for their intended postgraduate program of study.

"Professional biology" designated courses prepare students for other post graduate programs as well as a variety of future careers (and not only in biology). Students interested in undertaking a postgraduate Master's degree or any program or training involving biological research are advised to obtain research experience by completing an Honours degree (Biol 475 & 493) or carrying out an independent research project (Biol 499) under supervision of a suitable faculty member. Please consult the Chair or Coordinator of Students for details.

Course Number & Title	Health Biol		Professional Biol				Course Prerequisites/Notes <i>See Also Information on Approved Electives at Bottom B = Biology, C = Chemistry, P = Physics, S = Statistics</i>	"x" Not Offered 2018-19
	Health	Ecology	Cell/Molecular	Animal	Plant	Aquatic		
301 Form and function in animals	x	x		x		x	B201 and P100 or P120	x
302 Evolution		x	x	x	x		B201/B204	
304 Vertebrate physiology	x		x	x			B201 or B251/B252 combination	
307 Field biology (first 2 weeks in May, numbers permitting)				x	x	x	B203	
308 Biology of populations		x		x	x		B203 or permission of the instructor	x
311 Coastal marine ecology		x		x	x	x	B203	
315 Introductory microbiology (designated core course)	x	x	x	x			B201/B204/ and C220 or combination of C225/C255	
317 Molecular biology	x		x	x	x		B204/B315	
320 Biology of Cancer	x		x	x			B204 plus one of B201 or B251/252 combination	
331 Statistical Methods	x	x	x				S231; Crosslisted as STAT 331	
335 Developmental biology	x		x	x			B201/B204	
342 Invertebrate zoology		x		x		x	B201	x
343 Comparative anatomy of vertebrates	x	x		x		x	B201	
345 Communities and ecosystems		x				x	B201/B202/B203	
360 Global change biology		x		x	x	x	B201/B202/B203	
374 Human neuropsychology (PSYC 373)	x						12 credits PSYC (Crosslisted as PSYC 373)	
381 Selected topics: Insect biology		x		x			B201	
391 Junior seminar (open to all, career & skills development)							Required for Junior Advanced Majors and Honours	
395 Cell biology	x		x	x			B201/B204 and C220 or 255	
407 Integrated resource management		x					B203	
411 Evolutionary developmental biology			x	x			B302 or B335	
416 Immunology	x		x	x			B315	

417 Microbial pathogenics	x		x	x		B315	x
419 Microbial pathogenics	x		x	x		B416	
452 Bioinformatics	x		x	x		B317 or permission of the instructor	
453 Advanced behaviour neuroscience I (PSYC 431)	x			x		<i>PSYC 230 (Crosslisted as PSYC 431)</i>	
454 Advanced behaviour neuroscience II (PSYC 432)	x			x		<i>PSYC 230 (Crosslisted as PSYC 432)</i>	x
468 Restoration ecology		x			x	B201/B202/B203 (B345 recommended)	x
472 Freshwater ecology		x			x	B203	
474 Environmental biology of soils		x			x	B203	
475 Accessing the biological literature						<i>Restricted to Honours students</i>	
481 Selected topics: The Physiology of Circadian Timekeeping	x		x	x		B201/204 and B251.252 or B304 or B335	x
484 Animal behaviour	x	x		x		B201 or PSYC230	x
491 Senior seminar						<i>Required for Senior Advanced Majors and Honours</i>	
493 Honours thesis						<i>Restricted to Honours students</i>	
499 Directed studies						<i>Faculty guided, tutorial-based learning</i>	

**Acceptable for Biology Course Credit with Permission, Advanced Majors & Honours Only**

CHEM 255 Introductory biochemistry (Advanced Majors & Honours)  
 CHEM 355 Advanced biochemistry (Advanced Majors & Honours)  
 CHEM 455 Medicinal Chemistry (Advanced Majors & Honours)  
 PHYS 101/102 Physics I & II (Honours)  
 CO-OP 405 Work term and integrated learning (Co-op students only)

**Some Approved Electives, Human Kinetics & Human Nutrition Courses of Biological Interest**

***Most math & science courses are approved electives, but not courses intended for non-science students (ask if in doubt about a course)***

**Professional Program Courses (May require approval of Department)**

HKIN Courses: Some are open to non-majors with permission of the professor and the department chair.

HNU 261 Introduction to nutrition  
 HNU 262 Principles of nutrition in human metabolism

**Suggested Approved Elective Science Courses of Biological Interest**

**Note: Most math & science courses are approved electives, but not courses intended for non-science students (ask if in doubt about a course)**

**See Department or Program Course Listings for Prerequisites & Other Courses**

AQUA 100 Intro to Aquatic Resources: Natural Science Applications (C&D summer course only)  
BIOL: Additional Biology courses are approved electives  
BIOL 382 Selected Topics: Time (Interdisciplinary Biology, Music, Phsics, Religion & Philosophy  
CHEM 355 Advanced biochemistry  
CHEM 455 Medicinal chemistry  
CSCI 225 Coding for Health Analytics  
ESCI 216 Earth History  
ESCI 266 Hydrology  
ESCI 272/CLEN 202 Understanding Climate Change  
ESCI 273 Health and the environment  
ESCI 274 Health impacts of global environmental changes  
ESCI 278/PHYS 278 Introduction to atmospheric physics  
ESCI 285/BIOL 285 Paleontology: The history of life  
MATH 287 Natural resource modelling NOT OFFERED 2018-19  
MATH 472 Selected Topics: Introduction to Epidemiology.  
PHYS 271 Astronomy: The solar system (NOT PHYS 171, an open elective only)  
PHYS 272 Astronomy: The stellar system (NOT PHYS 172, an open elective only)  
PHYS 278 Introduction to Atmospheric Physics  
PHYS 298 Selected Topics: Medical Imaging.  
STAT 231 Statistics for Students in the Sciences  
STAT 311 Survey Sampling Design  
STAT 331/BIOL 331 Statistical Methods  
**NOTE:** STATS 231 Is Required for Advanced Majors/Honours in Biology

**List of Approved Elective Arts Courses, Acceptable Due to Biological Content or Relevance (May Require Prerequisites & Dept. Approval)**

ANTH 218 Anthropology of health and illness  
ART 346 Botanical art and illustration: Drawing  
ART 347 Botanical art and illustration: Painting  
ART 351 Anatomy for the Artist: Drawing  
ECON 281 Environmental Economics NOT OFFERED 2018-19  
ECON 364 Health economics  
ECON 381 Natural Resource Economics NOT OFFERED  
HIS 324 Plagues and People  
PHIL 213 Philosophy of science  
PHIL 333 Environmental ethics  
PSCI 247/SOCI 247 Environmental social science I: Problems and paradigms  
PSCI 248/SOCI 248 Environmental social science II: Power and change NOT OFFERED  
PSCI 346 The politics of resource management NOT OFFERED  
PSCI 347 Politics of the environment NOT OFFERED  
PSYC 225 Sensation and perception  
PSYC 230 Brain and behaviour  
PSYC 313 Health Psychology  
PSYC 327 Psychology of pain  
PSYC 328 Neural mechanisms of pain and analgesia  
PSYC 367 Basics of psychopharmacology  
PSYC 368 Pharmacology of drugs of abuse  
PSYC 373/BIOL 374 Human Neuropsychology  
PSYC 431/BIOL 453 Advanced Behavioral Neuroscience I  
PSYC 432/BIOL 454 Advanced Behavioural Neuroscience II  
RELS 300 Health care ethics  
SOC 298 Selected Topics: Sociology of Health