

**BIOL 108****Introduction to Biodiversity**

*3 Credits, 3 hours lecture, 3 hours lab per week*

In this course we will examine the interplay between our planet and the organisms which inhabit it. We will discuss the history of life on our planet and the methods used to infer evolutionary histories and classify organisms. The principles which unite all living things and the unique adaptations which characterize the major lineages will be discussed using examples from bacteria, fungi, protists, animals, and plants. Upon completion of this course, students should have an understanding of some of the major principles of evolution and systematics. Laboratories will survey the diversity of biological form and function, and introduce students to data collection and scientific writing. Through an overview of the three biological domains, students should gain an appreciation of the remarkable diversity of living organisms with which we share the planet.

*Prerequisites BIOL 030*

**Instructor**

Dr. David Smith  
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**Office Hours**

Monday – Friday 11:00 – 11:50

**Hours and Location of Instruction**

Monday 1:00 – 1:50 Room 228  
Tuesday 2:00 – 4:50 Room 234  
Wednesday and Friday 8:00 – 8:50 Room 215

**Required Resources****Textbook title,**

\*Campbell, N. A., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V. and Jackson, R. B. 2012. *Biology, Canadian Edition*. Benjamin/Cummings Publishing Company. San Francisco, California, USA. ISBN: 978-0-321-77830-7

\* *The 9<sup>th</sup> edition of Biology is also acceptable*

**Course Outcomes**

Upon successful completion of this course, students will be able to:

- 1) Explain basic principles of ecology, evolution, and Mendelian genetics, with a focus on the origin and diversity of life.
- 2) Use current phylogenetic and taxonomic nomenclature to describe the diversity of life on earth, and explain how evolutionary history is reflected in the nomenclature of organisms, including reference to major evolutionary innovations.

3) Use scientific inquiry to ask and answer questions about the world around them. This includes understanding the strengths and limitations of scientific inquiry and recognizing common mis-uses/mis-understandings.

### Evaluation

Clearly outline what students must do in order to pass or complete the course.

Assignments	4 @ 5% = total of 20%, due every 3 weeks
Midterm 1	10%, week of Jan. 26
Midterm 2	20%, week of Feb. 16
Lab exam	20%, week before final exams
Final Exam	30%, week of April 20
Total	100%

*A grade of C- is required for progression or transfer.*

### Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory <b>Progression</b>	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor <b>Minimum Pass</b>	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

**Proposed Schedule of Lecture Topics**

Lecture Topic	Textbook Reading
Jan. 5 - Introduction – The scientific method and the scale of biology	1.1-1.3
Jan. 5 - Darwin and natural selection	22.1-22.3
Jan. 12 - Evolution of populations (microevolution)	14.1-14.2; 23.1-23.4
Jan. 12 - The origin of species (speciation)	24.1-24.4
Jan. 19 - Taxonomy, systematics, phylogeny, and classification	26.1-26.5
Jan. 19. 2 - A brief history of time: the origin of life, fossils and their relevance	25.1-25.4
Jan. 26 - Prokaryotes	27.1-27.6
Jan. 26 - Endosymbiosis and the evolution of eukaryotes	25.3, 26.6
Feb. 9 - Reproductive strategies: why does sex exist?	12.1-12.2; 13.1-13.4
Feb. 16 - Protists	28.1-28.7
Mar. 2 - Plant diversity I: bryophytes and pteridophytes	29.1-29.3
Mar. 2 - Plant diversity II: seeded plants	30.1-30.4
Mar. 9 - Functional anatomy of seed plants	35.1-35.4; 36.3-36.4
Mar. 16 - Fungi	31.1-31.5
Mar. 23 - Animal development and classification	32.1; 32.3-32.4
Mar. 30 - Animal diversity I: invertebrates	33.1-33.5
April 6 - Animal diversity II: chordates and vertebrates	34.1-34.8

**Proposed Schedule of Laboratory Topics**

Jan. 5	No lab
Jan. 12	No lab
Jan. 19	Lab 1 – Biological tools and aseptic techniques, discuss primary literature assignment
Jan. 26	Lab 2 – Mechanisms of evolution (dot lab)
Feb. 2	Lab 3 – Population genetics (bead lab) Assignment on Labs 1-3 – 5% due Feb. 16
Feb. 9	Lab 4 – Domain Bacteria and sterile technique Lab report assigned for “Efficacy of Antimicrobial Products”, worth 5 %, report due week of March 2
Feb. 16	Lab 5 – Domain Bacteria continued (data collection) and survey of Kingdom Fungi
Mar. 2	Lab 6 - Student presentations of primary literature – 5%
Mar. 9	Lab 7 - Kingdom Plantae and selected photosynthetic Protists of importance to the evolution of Kingdom Plantae
Mar. 16	Lab 8 – Kingdom Animalia – part 1
Mar. 23	Lab 9 – Kingdom Animalia – part 2
Mar. 30	Review
April 6	Lab exam

**Please Note:**

Date and time allotted to each topic is subject to change. It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College Credit Calendar.

**Performance Requirements****Laboratory Safety**

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering

the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

### **Student Attendance**

Class attendance is useful for two reasons. First, class attendance maximizes a student's learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

### **Academic Misconduct**

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment

Penalties for academic offences range from a verbal reprimand to dismissal from the College, and in certain circumstances may involve legal action.

### **Specialized Supports**

#### **Counselling and Disability Services**

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

#### **SKILL Centre**

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

**Authorization**

This course outline has been reviewed and approved by the Program Chair.

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David Smith, Instructor

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Louis Dingley, Chair

Date Authorized

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Guy Harmer, Dean

Date Authorized

**Signed copies to be delivered to:**

Instructor

Registrar's Office