UNIVERSITY OF SASKATCHEWAN

COURSE SYLLABUS

COURSE TITLE:	BIOL 121 The Diversity of Life		
COURSE CODE:	22165	TERM:	T2 2017/18
COURSE CREDITS:	3.0	DELIVERY:	Lecture & Practicum (Lab)
CLASS SECTION:	01	START DATE:	January 3ed, 2018
CLASS LOCATION:	Room HLTH 1150	LAB LOCATION:	Room BIOL 204
CLASS TIME:	12.30 to 01:20pm (MWF)	LAB TIME:	Varies with lab section
WEBSITE:	via Blackboard		

Course Description

Our world has at least 15 million species, all of which have adapted to particular environments and lifestyles and use energy to grow and reproduce. We examine these processes in representative organisms from all the major groups, and discuss factors influencing changes in biodiversity over time and space.

Prerequisite(s): Biology 30 or BIOL 107 or BIOL 108.
Note: Students with credit for BIOL 110 will not receive credit for BIOL 121.

Course Overview

This course is designed to introduce you to the vast and exciting field of biology, with a focus on biological diversity, evolution, adaptations of organisms to specific environments, and the evolutionary and ecological factors influencing changes in biodiversity over time and space.

Learning Outcomes

By the completion of this course, students will be expected to:

1. have an understanding of biological principles (concepts), and that evolution is the unifying principle in biology
2. gain an appreciation for biology as an experimental science [hence, provide necessary background for advanced study of biology and other related disciplines], an realize that an understanding of biological principles requires knowledge of other fields of science (chemistry, physics, geology, geography, mathematics, biochemistry) and many disciplines within biology (e.g. evolution, ecology, genetics, physiology, structure and function, ethology, parasitology, molecular biology, etc.).
3. obtain knowledge of the diversity and complexity of life, which includes how organisms are adapted to their environment and the variation (e.g. morphological, genetic, physiological, behavioral) that exists among individuals of the same species and between individuals of related species
4. be able to think critically regarding scientific issues in our society and understand the importance of relationships between organisms and their environment, and how biodiversity is constantly changing over time

Specifically, students should know:

- the characteristics that unite all living organisms, and why viruses and prions are considered non-living entities
- the differences between unicellular/multicellular organisms and heterotrophs/autotrophs
- that different organisms reproduce in different ways; sometimes using more than one mode of reproduction; and the advantages/disadvantages of asexual/sexual reproduction
- that water represents the matrix or solvent of life
- the biological species concept and other ways to define species; the hierarchical system of nomenclature
- that there is difference between species and variation among individuals in, for example, their morphology, genetics, ethology, ecology, physiological responses to the same environmental conditions, etc.
- that museums represent the catalogues of the diversity of life both in time and space
- the definition of biological diversity; and the problems with quantifying species diversity
- that species are not fixed in time; what Darwin saw and how he made conclusions about his observations that led to the theory of evolutionary change by means of natural selection; and the evidence to support this theory
- that some organisms are more suited (better adapted) to their environment, but that this is no guarantee of survival and opportunity to reproduce; the concept of reproductive fitness
- that variation is essential for natural selection to work; natural selection acts on individual organisms but evolutionary change take place at the population level
- the differences between microevolution/macroevolution; the principles of homology, analogy and homoplaisy; allopatric species, adaptive radiation, and that evolution is unidirectional
- the difference between natural selection/sexual selection; importance of the differences (diversity) between sexes
- the difference between biotic and abiotic factors; influence of abiotic factors on the reproductive fitness of organisms
- that there is considerable ecosystem diversity – and that environments and the organisms in them have changed over time
- what were the first organisms that lived on earth, the importance of O_2 in changing species diversity, why did multicellularity come about, the conquest of land and air (by multiple groups) and the challenges organisms faced and how they were overcome [examples of adaptation]
- when the ancestors of the representative organisms appeared on earth
- that species diversity has changed over time in response to major environmental changes; e.g. mass extinctions, climatic change [pre-human effects]
- what is symbiosis and the types of symbiotic relationship; coevolution [arms-race; predator-prey, parasite-host] and the role these play in changing biological diversity; the role of competition
- the interrelationships of organisms and biodiversity; concepts of niche, food webs/chains
- the relationship between species diversity and the theory of island biogeography
- the relationship between community structure (and trophic relationships) and species diversity in communities
- the effect of human (Anthropogenic) influences [fire, invasive species, habitat fragmentation, mining, etc.] on biodiversity over space and time [past, present, future]; including the Canadian prairies
- the concept of biological hotspots, and why the need to converse biological diversity

Note: The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: http://www.usask.ca/university_secretary/LearningCharter.pdf

More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at:
http://www.usask.ca/university_secretary/council/academiccourses.php

Class Schedule

Week Dates	Lecture Topics	Laboratory Activity
Week 1 Jan 3 & 5	Course Introduction, 25 representative organisms;pioneers and scholars in biology; inductive & deductive reasoning in study of science; scientific methods;introduction to life and water	NO LAB
Week 2 Jan 8, 10 & 12	Living &non-living entities; characteristics of life;hierarchy of life	LAB 1 - Introduction & Prokaryotes
Week 3 Jan 15, 17 & 19	Introduction to biodiversity; unicellular organisms; prokaryote vs eukaryote; bacteria; viruses, viroids and prions; classification of organisms; domains of life	LAB 2 - Protists
Week 4 Jan 22, 24 & 26	Introduction to biodiversity; plantae;fungi; protists	LAB 3 - Fungi
Week 5 Jan 29, 31 & Feb 2	Animalia; intraspecific & interspecific variation	LAB 4 - Green algae, mosses, ferns & club mosses
Week 6 Feb 5, 7 & 9	Microevolution & macroevolution; concepts of morphological, ecological species,biological species	NO LAB
Week 7 Feb 12, 14	Changes in biodiversity through time; theory of evolution of Darwin	LAB 5 - Conifers & angiosperms
Friday, Feb 16	Mid-Term Examination includes material to the end of Microevolution & Macroevolution 5:00-6:00 pm, Room TBA	LAB 5 - Conifers & angiosperms
Week 8 Feb 19, 21 & 23	**Midterm Break – no Lectures**	Midterm Break – no Lab
Week 9 Feb 26, 28 & Mar 2	Changes in biodiversity through time; evidence to support the theory of evolution	LAB 6 - Sponges, Cnidarians, Flatworms& Nematodes

	Variations; biological adaptation; adaptation by natural selection; sexual selection; geographic isolation;	
Week 10 Mar 5, 7 & 9	Diversity of life; evolution and evolutionary steps of life; allopatric speciation; adaptive radiation; history of earth; geologic time scale; living fossils	LAB 7 – Mollusks, Annelids& Arthropods
Week 11 Mar 12, 14 & 15	Interactions between organisms and effects on biodiversity; unknown species; dominant species, and keystone species	LAB 8 - Echinoderms & Chordates
Week 12 Mar 19, 21 & 23	Biodiversity hotspots; measurement of biodiversity; subfields of ecology; biotic and abiotic factors	Review lab
Week 13 Mar 26, 28	Types of species interactions; introduced and invasive species; functional extinction	Final lab exam **March 30th good Friday/No lecture or lab**
Week 14 Apr 2,4 & 5	Human influences on biodiversity and ecosystem; conservation of biodiversity course wrap-up and course review	
	Final Examination during regular exam period	

Laboratory class information:

1. Labs begin the week of Jan 8th.**Make sure you have registered for a lab on-line.** Students are expected to attend and be on time for all scheduled labs, review labs and final lab exams. The lab schedule is provided on the previous page of this document.

2. **The current edition of the Biology 121.3 lab manual is required for all labs** (this item can be purchased from the Bookstore in Marquis Hall). For your labs you may also need a 2H, 3H or 4H drawing pencil, an eraser, white (unlined) drawing paper or loose leaf paper for notes, a calculator and a metric ruler.

3. Any other questions regarding the lab should be directed to the laboratory staff in Room 216. See page 2 of the lab manual for contact telephone numbers.

Instructors, Course Coordinator & Lab Coordinator

Contact Information:

Mr. Joel Yurach Lab Coordinator	room 216 Biology Bldg joel.yurach@usask.ca	306-966-4423
Dr. Manar Angrini Lectures instructor	room 324 Biology Bldg manar.angrini@usask.ca	306-966-4437

Required Resources **(purchase from Main bookstore, Marquis Hall)**

Lab Manual: Biology 121.3 Laboratory Manual (2017-2018 Edition)

There is **NO** required textbook for this course

Downloads

These will be available as appropriate through the course Blackboard. The only document that you are required to download and read is the course syllabus. **Please note that instructor's Power-point slides or lecture notes may be provided to you as a courtesy**. You are not required to download or print these slides/notes. While the instructors will endeavor to have the lecture Power-point slides/notes posted sometime in advance of the lectures; however, they will not guarantee this. Each instructor will provide you with additional information about their downloads.

Grading Scheme

Midterm exam	15
Final exam	45
Lab Assignments & quizzes	20
Lab exam	20
Total	100%

Evaluation Components

Midterm Exam:

Value: 15% of final course grade
Date: ***This midterm lecture exam will be held on Friday, February 16th*** at 5:00 pm.
Length: 50 minutes
Format: 40 multiple-choice questions; machine marked
Description: Will include all lecture's material to end of Microevolution & Macroevolution. Calculators and all other electronic devices are not allowed.

Final Exam:

Value: 45% of final course grade
Date: Consult Final Exam Schedule
Length: 3 hours
Format: 100 multiple-choice questions; machine marked
Description: The exam is comprehensive in that it will cover all lecture material. However, material delivered after the midterm exam will be emphasized. Calculators and all other electronic devices are not allowed.

Laboratory Assignments & Quizzes:

Value: 20% of final course grade
Date: see Laboratory Schedule
Format: Quizzes (written); spot tests; flower project
Description: The quizzes will be 15-20 minutes in duration and test material from the previous two or three lab exercises. The questions will generally require a short written answer. Spot tests involve images shown in PowerPoint and short questions about the specimen shown. No phones, laptops, tablets or other material allowed. Additional information about the lab quizzes can be found in your lab manual, and will be given in the weeks prior to the assignment.

Laboratory Exam:

Value: 20% of final course grade
Date: Week of March26th, 2018
Length: 1.5 hours
Format: This will be a mixture of spot test, short written answers and possibly practical questions (slide prep, etc.)
Description: The exam is comprehensive in that it will cover all laboratory classes. Calculators and all other electronic devices are not allowed.

University of Saskatchewan Grading System

Students in BIOL 121 are reminded that the University has established a grading system to be used in all of its courses. Information on literal descriptors for grading at the University of Saskatchewan (reproduced below) can be found at:
http://students.usask.ca/current/academics/grades/grading-system.php

Scheduling of Exams

Students must bring their current University of Saskatchewan student card to all exams and be prepared to present it for verification purposes. Entry into certain campus buildings where exams may be held, also requires a valid student card.

It is forbidden for students to utilize in any way during an exam, any electronic device (e.g., cell phone, dictionary, palm pilot, translator, etc.). This includes calculators because these are not required for any exam.

Midterm and final examinations, and the lab exam, must be written on the date scheduled. Final examinations may be scheduled at any time during the examination period in August2017; students should therefore avoid making prior travel, employment, or other commitments for this period.

In the event that a student is absent from the **midterm exam** through no fault of his/her own due to a medical emergency, death in the family, or other valid reasons, documentation must be provided explaining the absence, to assist in the determination of whether permission will be granted for the student to write a deferred mid-term exam. Students absent for the Mid-Term Lecture Exam **must advise their Instructor in person or by telephone (not by email) and initiate arrangements for writing a Deferred Mid-Term Exam, within 3 working days of the missed exam**, in order to avoid being assigned a grade of zero for the exam.

If a student is absent from the **final exam** through no fault of his or her own for medical or any other valid reason, **he/she must apply to the Dean's Office of the College in which he/she is registered for an opportunity to write a Deferred Final Exam**, **within 3 working days of the missed exam**. Documentation must also be provided to explain the absence from the final exam. Deferred exams may utilize a different format than the regular exam, at the sole discretion of the instructors.

Consult page 2 of the 2017-2018 Lab Manual for the procedure to follow for a missed Lab Exam.

Students are encouraged to review all examination policies and procedures:
http://www.usask.ca/calendar/exams&grades/examregs/

Student Feedback

Marks from machine-graded exams are usually available within one week. The multiple-choice questions will not be posted after the exam. Students will be encouraged to meet with the instructor to review their performance.

Attendance Expectations for Laboratory Classes

Students are expected to attend all scheduled lab periods. Students are advised to consult the lab manual for further information aboutBIOL 121 procedures to follow when they are too ill to attend the lab period (and/or lab exam) or are facing extenuatingpersonal circumstances.

Integrity Defined (from the Office of the University Secretary)

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Websiteand avoid any behaviorthat could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct (http://www.usask.ca/university_secretary/honesty/StudentAcademicMisconduct.pdf) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (http://www.usask.ca/university_secretary/honesty/StudentNon-AcademicMisconduct2012.pdf)

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at:
http://www.usask.ca/university_secretary/pdf/dishonesty_info_sheet.pdf

Important Note: *Additional information about student misconduct specific to BIOL 121 can be found in the laboratory manual. BIOL 121 students are required to read and understand the information about misconduct that is presented in the laboratory manual.*

Examinations with Access and Equity Services for Students (AES)

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services for Students (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals. In order to access AES programs and supports, students must follow AES policy and procedures. For more information, check http://www.students.usask.ca/disability/, or contact AES at 306-966-7273 or aes@usask.ca.

Students registered with AES may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.
