Division of Applied Science & Management
BIOL 102
3 Credit Course
Winter, 2020

COURSE OUTLINE

BIOL 102

Principles of Biology II

3 CREDITS

PREPARED BY: Tara Stehelin, Instructor
DATE: December 16, 2019

APPROVED BY: Stephen Mooney, Interim Dean, ASM
DATE: December 16, 2019

APPROVED BY ACADEMIC COUNCIL: Click or tap to enter a date
RENEWED BY ACADEMIC COUNCIL: Click or tap to enter a date

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Academic Council, Governance Office
Academic Council MyYC: Policies, Procedures and Forms

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BIOLOGY 102, Principles of Biology II

INSTRUCTORS: Tara Stehelin, BSc, MSc
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OFFICE LOCATION: A2806

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OFFICE HOURS: Fri 11:00 – 12:30,
or by appointment

CLASSROOM: Lecture A2402
Lab A2805

TIMES: Lecture: Tues/Thurs,10:30 – 12pm
Labs: Fri 9am-12pm OR 1-4pm

DATES: Jan. 7 – April 16, 2020

COURSE DESCRIPTION

A companion course to Bio 101, this introductory biology course emphasizes principles applicable to all living organisms, including an introduction to cell structure and function, macromolecules in cells, metabolism, processes of cellular reproduction and genetics, patterns of inheritance, molecular biology of genes, animal form and function, plant form and function, plant and animal nutrition and some of the major organ systems. This course is part of core introductory science, transferrable to most Canadian universities as one semester of a comprehensive first-year level Biology course. A comparative approach to the unity and diversity of organisms is stressed. Mandatory lab sessions reinforce subject matter presented in lectures.

PREREQUISITES

Admission to the Division of Applied Science and Management and successful completion of Bio 101 (C- or higher) *or permission of instructor*. Math 12 (MATH 060, or equivalent) is recommended as a prerequisite. Students are expected to use basic mathematical skills.

EQUIVALENCY OR TRANSFERABILITY

When taken with Biology 101, these two courses transfer as two semesters of first-year biology to most universities in British Columbia.
Please see the BC Transfer Guide or contact the School of Science for more information on transferability.

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to demonstrate understanding of

- general biochemistry and metabolism in cells
- the general structure of the cell and the organelles within cells and structure and function of membranes, mechanisms of transport at the cellular level
- the process and the steps involved in cellular reproduction,
- mechanisms by which genetic traits are inherited and various patterns of inheritance, DNA structure, DNA replication, transcription and translation,
- physiological divisions of tissue and cell types, as well as an understanding of organ functioning and some organs systems in both plants and animals, including immunity, endocrine control in both plants and animals, nervous control, and mechanisms of homeostasis in animals,
- animal sensory systems, muscle systems

Upon completion of mandatory lab sessions students will be able to perform basic lab skills such as prepare wet mounts of live cells, view slide preparations under the microscope, identify organelles within cells and conduct basic laboratory tasks such as incubation of test tube cultures in an incubator. Students will also be able to demonstrable understanding of patterns of inheritance, basic statistical tests on data, major vertebrate organ systems, such as digestion, gas exchange and circulation, immunity, excretion, and muscle systems. Students will also be able to demonstrate hands-on ability and understanding of detailed vertebrate dissection and lab protocol, including safety. Students will also be familiar with components required in a full lab report.

COURSE FORMAT
Material will be presented in two 1.5 hr lectures and one 3 hr lab session per week. Attendance in the laboratory is mandatory. *Students must pass the lab and lecture portions of the course independently.*

Attendance and Participation
Attendance is mandatory in labs and greatly encouraged in lectures.
Absence from labs results in a zero grade assigned for assignments and quizzes relevant to the missed lab. If the instructor is notified in advance of potential problems with attendance, alternate work may be assigned.
Students must attend the laboratory session assigned to them upon registration, once per week.

Participation
Students are expected to participate actively in laboratory exercises, including taking part in classroom discussions of results of lab activities and experiments.

LAB ASSIGNMENTS

Assignments are given during laboratory sessions and graded on the basis of understanding and applying principles involved as well as the correctness of answers to solutions. Most students finish assignments during the lab session, although they are not due until 12:00 noon the next week day. A lab quiz covering material from the previous lab as well as some material from that week's lab will be given each during each scheduled lab (except the first lab) to assess progress. *Students are expected to read the material for that day's lab before coming into lab.*

TESTS

Lecture

Quizzes/midterms on lecture material are given approximately once every two weeks. There are 5 quizzes in total, worth 10% each and a final exam worth 15% of the total mark. The final examination will be held at the end of the term and will cover material from the entire course, although it will focus mostly on the last portion of material. The examination date will be announced as soon as confirmed by administration.

Lab

Quizzes on laboratory material are given every lab session (except the first lab) and cover material from the lab exercises the week before and from that day's lab. There is no final lab exam.

EVALUATION

On lecture material	
Quizzes (5) 10% each	50%
Final exam	15%
On laboratory material	
Assignments (12)	17.5%
Quizzes (10)	17.5%
Total	100%

REQUIRED TEXTBOOKS AND MATERIALS

Students can use the same textbook for Biology 101 and Biology 102.

Reece, J. B., L. A. Urry, M. L. Cain, S. A. Wasserman, P. V. Minorsky, B. Jackson, F. Rawle, D. Durnford, C. Moyes, S. Walde and K. Wilson. (2014) ***Campbell Biology, 2nd Canadian Edition***. Pearson, Benjamin Cummings ISBN 978-0-321-77830-7

Or

"Campbell Biology" 9th or 10th Edition, Reece, Urry, Cain, Wasserman, Minorsky, and Jackson. Pearson Benjamin Cummings

Lab Manual: assembled by instructor and handed out during first lab session.

ACADEMIC AND STUDENT CONDUCT
Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

PLAGIARISM
Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY
Yukon College recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

ACADEMIC ACCOMMODATION
Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC): lac@yukoncollege.yk.ca.

THE LORENE ROBERTSON WRITING CENTRE
All students are encouraged to make the Writing Centre a regular part of the writing process for coursework. The Lorene Robertson Writing Centre is staffed by helpful writing coaches from across the College and offers one-on-one

appointments to students in need of writing support. For in-person appointments, the Centre coaching office is located in the Academic Support Centre in room A2302. You can also participate in coaching appointments over the phone or online. See the Academic Support Centre schedule for English and writing support times.

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TOPIC OUTLINE

WEEK	TOPIC	Chapter
Cell Structure and Function		
3	Organelles, functions of each	6
Metabolism of cells		
1	Glycolysis and Cellular Respiration	9
2	Photosynthesis	10
		Quiz dates are set but topics are only approximate
		Quiz 1 Jan 23
	Membrane structure, the extra-cellular matrix	
4	Cell division, genetic inheritance	12, 13
5	Mendelian inheritance	14
		Quiz 2 Feb 6
6	The chromosomal basis of inheritance	15
	The molecular basis of inheritance	16
7	From gene to protein	17
		Quiz 3 Feb 27
Animal Anatomy and Physiology		
8	. Resource transport and gas exchange in plants	36
	. Soil and plant nutrition	37
	. Basic principles of Animal Form and Function (self-study and covered in labs)	40
9	. Animal Nutrition	41
		Quiz 4 Mar 12
10	. Circulation and Gas Exchange in animals	42
11	. Immune systems of plants and animals	Plants pgs. 905-907 Animals CH 43
Homeostasis of body fluids, liver, kidney function		
12	. Osmoregulation and excretion	44
13	. Hormones and the endocrine system	45
	. Sex hormones	Pages 1078 - 1084
	Reading Week March 16 - 20th	

		Quiz 5 April 2
14	. Neurons, nervous systems, the brain . *If we have time:* sensory receptors . Muscle function and muscle systems	48, 49 50
		Last class April 16th Final Exam(week of April 21 - 24)

LAB TOPICS AND SCHEDULE

Lab 1	The Cell – Cell Structure and function membranes
Lab 2	Metabolism: Glycolysis, Cellular Respiration and Photosynthesis
Lab 3	Cellular Reproduction – mitosis and meiosis
Lab 4	Genetics I, Mendelian patterns of inheritance using *Drosophila,* introduction to a basic statistical test, the *chi-square*
Lab 5	Genetics II, Mendelian patterns of inheritance using *Drosophila,* *sex-linked inheritance*
Lab 6	Animal Form and Function - Cell types, tissues, organs,
Lab 7	Digestive Systems - & *introduction to full lab report* *Vertebrate Dissection (start)*
Lab 8	Gas Exchange and Circulation
Lab 9	Immunity and introduction to Homeostasis
Lab 10	Homeostasis: osmoregulation and excretion
Lab 11	Nervous and Muscular Systems, the brain
Lab 12	Animal Behavior – field trip to Yukon Wildlife Preserve