



**CAMOSUN COLLEGE**  
**School of Arts & Science**  
**Fall 2008**  
**Biology 126 – Physiological Basis of Life**

**COURSE OUTLINE**

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The structure and functions of macromolecules, storage of information and replication of DNA as well as the role of DNA in protein synthesis and inheritance are described and related to the functions of whole organisms. Transport mechanisms, basic metabolism and hormonal and nervous regulation of function are explored with examples.

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Time and location:

Lectures:	T, Th,	4:30 - 5:20	F202
	F	12:30 – 1:20	F202
Lab:	Tu (Sec. 01A)	6:30 - 9:20	F 222
	Th (Sec. 01B)	6:30 - 9:20	F 244

Prerequisites: English 12 **or** assessment, **and** “C+” in Biology 12

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**Required Materials**

- 1) Textbook: Campbell, N. A. & J. B. Reece. 2007. Biology, 8<sup>th</sup> ed., Pearson Education, Inc., San Francisco, CA.
  - 2) Camosun College Biology Faculty. Fall 2008. Biology 126 Lab Manual, Camosun College, Victoria, B.C.
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**Instructor**

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**Office hours:** 9:00am to 10:30 Tu & Th  
**Campbell:** MBHULBERT33877  
**D2L:** Instructions to be provided

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**Basis of Student Assessment (Weighting)**

Lab Exam I	15%
Lab Exam II	15%
Midterm I	15%
Midterm II	15%
Final Lecture Exam	25%
Assignments, quizzes, vocabulary, lab reports, diagrams	15 %

\*\*\* Lab exams will be unit exams. Lecture exams will be cumulative.

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## **This course is about the Miracle of Life, as Einstein so appropriately described it.**

What does it mean to be sustainably alive? How do single cells like bacteria or complex multicellular organisms like we are function in life to survive, grow and reproduce? In this course you will have the opportunity to explore these questions from a biological perspective. Even if you don't become a biologist you will gain a broadened understanding of questions that may affect your life like: What is cancer? Why is crucial that women have children younger in life and less so for men? How do asthma, sickle cell anemia, and smoking affect every cell in the body? What should you take for diarrhea – a sugary drink or plain water or something else? What does cloning imply?

If you embrace and apply the ideas of this course you will understand how all living cells manage energy, interact and communicate with other cells, and then reproduce or die. Moreover you will understand what controls these processes and how their repetition determines the fate of each organism.

### **About this rigorous course**

To be successful, you must take responsibility for your own learning and participate as an active learner. This is not the type of class you can drop into occasionally; you really have to be actively involved. There will be group learning activities and individual learning activities. Both are necessary to process the amount of data, concepts and new language that you will be learning.

To take charge of your education, you must be willing to read and write. If you do not learn to communicate in words, you cannot formulate fully developed thoughts. To accomplish these goals, you will be given assignments that you will read, analyze, and think about between each class. You must also be willing to summarize and analyze data. To this end you will generate and analyze laboratory data and write lab reports. These assignments will help refine your thinking and understanding so that it becomes clearer, more precise, logical, and well-grounded in the scientific process.

### **Ways to Understand the Nature and Progress of your Learning.**

The following items will be used to evaluate your progress in reaching these goals while at the same time, providing you with feedback on your progress in understanding the course material:

1. Lecture and lab exams that are designed to assess your recall and understanding of the biological concepts relating to the molecular and physiological functioning of cells and organisms and the mechanisms of inheritance and diversity. The lecture exams will be cumulative. The goal is to encourage you to continue to learn and receive feedback on the critical concepts of the course.
2. Lab reports will integrate with the concepts presented in lecture and provide you with a hands-on experience in laboratory investigation with the opportunity to present that information in a scientifically acceptable format.
3. Ongoing quizzes, vocabulary, diagrams and assignments are designed to solidify and clarify concepts discussed in the course. These provide the necessary baseline data points upon which Biological concepts are woven. Life is a tapestry in and of itself, by itself. Learning about the tapestry of life is one that we will do together through a rigorous process of guided discovery.

### **Intended Learning Outcomes**

1. Classify and describe the unique structure and function of the four groups of macromolecules and discuss how these relate to their properties within living cells.
2. Differentiate among the various transport mechanisms available to mobilize molecules across cell membranes.
3. Name and outline the pathways utilized by cellular respiration and photosynthesis and explain the importance of these processes to living organisms.
4. Describe the basic steps of DNA replication and indicate its role in cell division and inheritance.
5. Demonstrate knowledge of the basic steps of protein synthesis, identifying the roles of DNA, mRNA, tRNA, amino acids and proteins in the processes of transcription and translation.
6. Identify and explain the principles and consequences of the cell cycle, including both mitosis and meiosis.

7. Examine the basic principles of Mendelian genetics and describe how these relate to other topics encompassed in this course.
8. Describe and explain the role of growth regulators in the control of plant growth, development and physiology.
9. Describe and explain the diversity of control mechanisms in animal systems, including the role of the endocrine and nervous systems.
10. Conduct experiment tests and use analytical techniques in the laboratory to demonstrate a few biological properties of macromolecules, cellular respiration, photosynthesis, DNA technology and plant and animal control systems.

#### **ADDITIONAL INFORMATION**

- No programmable devices are allowed in exams.
- Assignments are due at the **beginning** of the class period on the due date. Assignments not handed in at the beginning of class will be considered late, for which there is a 15% penalty/day.  
**Note:** There is the option of 1 free late assignment. There will be no penalty provided the assignment is received **prior** to it being marked and returned to the class. Any assignment received after its return to the rest of the class will be marked but will not receive credit.
- You should plan on a minimum of 6 hours outside of scheduled class time for the completion of assignments and for general studying.

#### **LEARNING SUPPORT AND SERVICES FOR STUDENTS**

There are a variety of services available for students to assist them throughout their learning. This information is available in the College Calendar, Registrar's Office or the College web site at <http://www.camosun.bc.ca/services/learning-skills/>

#### **ACADEMIC CONDUCT POLICY**

There is an Academic Conduct Policy. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College web site in the Policy Section. <http://www.camosun.bc.ca/policies/Education-Academic/E-2-Student-Services-&-Support/E-2.5.pdf>

## Course Content and Schedule

The schedule, which follows, is an attempt to outline the weekly activities of the class. It is subject to change or modification as the need arises.

Week	Dates	Lecture Topic	Chap.	Laboratory Exercise
1	Sept. 2 - 5	Characteristics of Life	1,2,3	No Lab
2	Sept. 8 - 12	Metabolism– Introductory Stuff	4,5	Lab 1 - Tools for Scientific Discovery
3	Sept. 15 - 19	Glycolysis and Respiration	8, 9	Lab 2 Enzyme Activity
4	Sept. 22 - 26	An End to Respiration Animal Nutrition	9,41	Lab 3 Respiration
5	Sept. 29 – Oct. 3	Photosynthesis Plant Nutrition	10,47	Lab 4 Photosynthesis
6	Oct. 6 - 10	<b>Midterm Exam 1</b> The Cell Membrane	6,7	Lab 5 Movement of Molecules
<b>October 13 – Thanksgiving - Classes cancelled</b>				
7	Oct. 14 - 17	Intercellular Communication	7,11	<b>Midterm Lab Exam</b>
8	Oct. 20 - 21	Mitosis, and the Cell Cycle	12	Lab 6 Mitosis & Meiosis
9	Oct. 27 - 31	Meiosis and Sources of Variation	13	Lab 7 Mapping DA using Restriction Enzymes & Electrophoresis
10	Nov. 3 – 7	Inheritance	14,15	Lab 7 completion
11	Nov. 10, Nov. 12 - 14	<b>Midterm Exam 2</b> Inheritance	15	<b>No Lab</b>
<b>Nov. 11 – Remembrance Day – College closed</b>				
12	Nov. 17 - 21	DNA Replication	16	Lab 8 Fruit Fly eye Pigments
13	Nov. 24 - 28	Protein Synthesis	17	Lab 8 Fruit Fly eye Pigments
14	Dec. 1 - 5	Regulation of Gene Expression	18	<b>Final Lab Exam</b>

**Final lecture examination will be scheduled during formal exam period.**