

*Hearken unto this, O Job: stand still, and consider the wondrous works of God.*

Job 37:14 (KJV)

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**Office Hours:** M & F from 10h00–11h00 & 13h00–15h00; W from 10h30–12h00. If you need to speak with me and these times don't work please email for an appointment.

## The course

**Time:** 08h55–09h55 MWF (lectures); 13h00–14h30 & 14h40–16h10 (Labs 1 & 2).

**Location:** VPH 207 (lectures); VPH 221 (labs)

### Textbooks:

- CAMPBELL ESSENTIAL BIOLOGY WITH PHYSIOLOGY by Simon, Reece and Dickey. 2013, 4th ed. Pearson Publ. ISBN: 0321772601.
- THE LANGUAGE OF GOD by Francis Collins. 2006, Free Press. ISBN: 0743286391.

This is a four credit course that caters for Biology non-majors who are compelled to complete Science courses. The purpose of this course is:

- for students to describe the *Ordering Principles* affecting life on Earth.
- for students to be able to identify the aforementioned ordering principles in Nature & be conversant in them.
- for students to be able to explain and apply the Scientific Method and be able to articulate reasoned positions pertaining to issues of Biology & Society.
- for students to learn of, and contemplate, the diversity of lifeforms & commonality of living processes.
- for students to explain how a knowledge of Biology can be used to illuminate Scripture and how Scripture can be used to add value to Science & Society.

Students will be expected to use the knowledge in the textbook and moral principles in Scripture to give reasoned opinions on matters pertaining to Biology. Students will be expected to give well reasoned, written answers in exams.

## Learning & Studying Biology

*Learning is an active process.* The idea of the brain storing discrete pieces of memory in defined areas is not correct. The brain assembles memories by using different parts of the brain, especially the sensory and motor parts of the brain concerned with touch, sight, hearing, talking and taking action. The more parts of

your brain you engage the better you will learn. Memories are also assembled on a foundation of existing memories—*prior learning*. In each class you must be prepared to participate in accessing the prior learning of the class and assembling new memories.

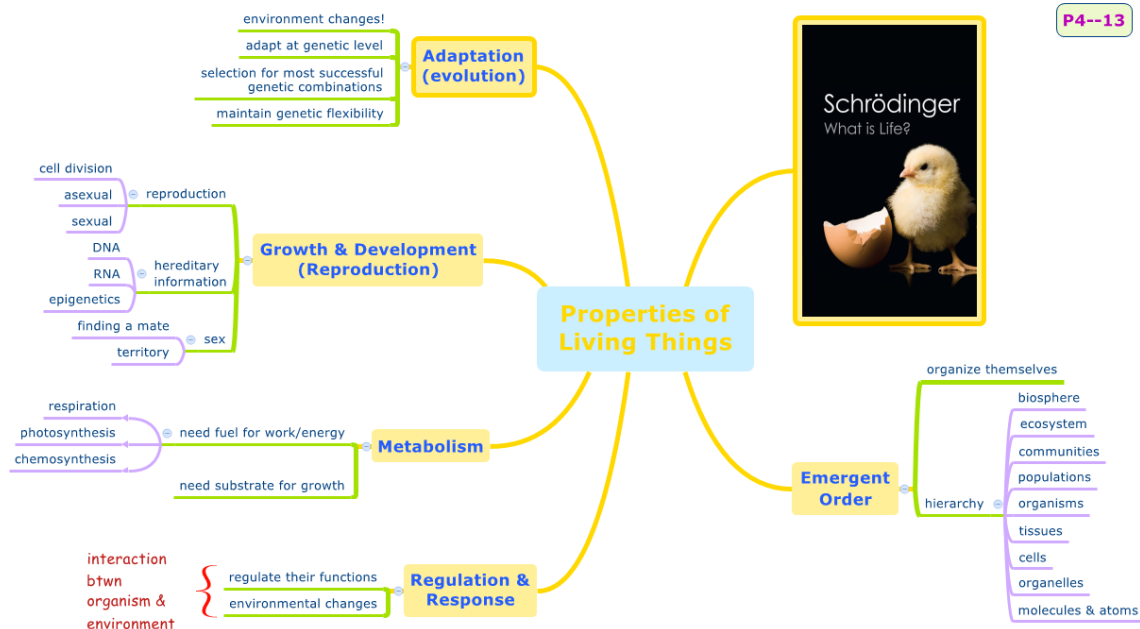


Figure 1: Example of a Mindmap based on the common properties of living things. For more information on how to make mindmaps see [https://en.wikipedia.org/wiki/Mind\\_map](https://en.wikipedia.org/wiki/Mind_map).

You will need to spend one to two hours studying outside of class for every hour in the class if you desire to do well in this course.

Lectures will focus on introducing students to biological terminology as well as illuminate the *Ordering Principles* that govern all life on Earth. Lectures will be given as a combination of Powerpoint, whiteboard and discussion. Labs will focus on gaining a practical understanding of Science and Biology. Student participation is essential in both instructional settings. Labs are designed to reinforce the material covered in the classroom. You will need to take note of the learning objectives associated with each lab.

The textbook will be used as a reference book and will not be systematically worked through (it is simply too big). Several themes of Biology will be explored and many *Ordering Principles of Biology* will be expounded upon. This course focuses on those ordering principles. The textbook will be used to explain and convey factual information related to these principles as well a source for biological vocabulary.

Lecture Powerpoints will be posted on Blackboard. You can use these to build your own notes. These will include learning objectives and key words and concepts you need to learn and be able to explain or identify as well as page numbers to relevant sections of the textbook. **These are your Study Guide.** To complete your notes you will need to take notes in class as well as consult the textbook. Additional readings will be assigned from the internet or other sources where necessary (everything isn't in the textbook).

Simply transcribing information from one book into another is a giant waste of time. Your brain constructs memories by making associations. Mindmaps are the best way to study the information and internalize it. I strongly encourage Mindmaps for study! An example is given in Figure 1. This simple Mindmap (below) will form the focal point of this course.

# Evaluation

Your efforts will be evaluated by seven means:

Assessment	Description	% of grade
Midterm exams	4 mid term exams (75 pts each.)	40
Critical Thinking	Four written reports or worksheets that critically explore biological principles encountered in society. Group or individual work. Variable points	20
Final Exam	1 exam, comprehensive. (100 pts)	15
Class quizzes	There will be ≈30 5 pt class quizzes. The best 20 will be used to tabulate your final grade. If you miss the quiz, you miss the quiz. These cannot be made-up later. Some quizzes will take the form of take-home written questions and other will be multiple choice.	10
Online quizzes	Taken on Blackboard, in parallel with classes. Quizzes close the day of the exam. 10–20 questions per lesson.	5
Lab assignments	Written report or worksheet. Group or individual work. Variable points.	5
Journaling	Four Language of God journals. Individual work. Handed in online or by email.	5
		100

Exam format is 15 points of matching words to their definitions; 30–40 points of multiple choice and true or false; and 20–30 points of written questions. Online quizzes are multiple choice and true or false and are examples of what you can expect in the exams.

Letter grades will be awarded according to the following scheme:

A	≥ 93%	B+	≥ 87%	C+	≥ 77%	D+	≥ 65%
A–	≥ 90%	B	≥ 83%	C	≥ 73%	D	≥ 60%
		B–	≥ 80%	C–	≥ 70%	D–	≥ 55%

Over the years the class average has ranged from a C+ to a B and only one person failed (they didn't hand in any of the assignments!!!).

## Student Obligations

*But I discipline my body and keep it under control, lest after preaching to others I myself should be disqualified.*  
1 Corinthians 9:27 (ESV)

You, as the student, expect that I will be in class every day and on time; that I will be prepared for class and labs; that I will return graded work in a timely manner; and be available for consultation. It is expected that you will attend class and exams. Class Quizzes are used as an attendance roster. If you are involved in one or another extracurricular activity and you know in advance that you will not be in class for the exam **let me know before hand** so you can write the exam in a timely manner. In the case of an emergency your exam can be rescheduled.

Please see the [Student Handbook](#) (pages 12 and 13) with regards to Academic Integrity, Cheating and Plagiarism<sup>1</sup>. It is your responsibility to know the rules. It is expected that you will respect the privacy of other students (see page 12) and try to avoid seeing another student's grade. Due to the nature by which exams and quizzes are returned this is not always practical. (If you are very sensitive about your grades let me know

<sup>1</sup>Plagiarism: to use the words or ideas of another person as if they were your own words or ideas. If you quote something from a website or book (by, for example, cutting-and-pasting), the correct thing to do is to cite the source.

in advance.) Also see Accommodations for Students with Disabilities (page 3) and again, please let me know in advance if you need assistance in accommodating your learning needs (e.g. extra time, a computer for written exams etc...).

**Policy on electronic devices:** Talking and texting in class is rude and disruptive. Please refrain from such behavior. The use of tablets and notebook computers are permitted for study purposes. Using them to play games in class is distracting to others and is not permitted. A soft-touch keyboard would be best for all should you decide to use a computer in class. If you want to use a computer or tablet in class, please sit along the periphery of the class so as not to be a temptation to others.

## Course Outline

This is a tentative outline of the course. The sequence of class topics may change. There will be a revision class before each exam. After the January 22<sup>nd</sup> test dates will not be moved (but exam content may be altered as needed). Please check other class syllabi to determine if there are any exam date conflicts. Some lecture headings/topics may change to meet the interests of the class.

Examination	Class Topics	Lab Date	Lab Topic
Exam 1: Organization Wednesday Feb 3 100 points Task due dates: Jan 29 Critical Thinking 1 Feb 1 LoG (Ch1–3)	What is Science? What is life? Hierarchical organization of life Life needs water Living things are made up of molecules Cells are the basic unit of life Tissues form organs	Jan 13 Jan 20 Jan 27	Scientific Method Molecules of life Cells & Tissues
Exam 2: Life uses energy Wednesday March 2 100 points Task due dates: Feb 26 Critical Thinking 2 Feb 29 LoG (Ch4–6)	Energy flows through organisms The Economy of the Cell Chemical Energy & Metabolism Chemical Recycling Organisms need to eat	Feb 17 Feb 24	Respiration Physiology Lab
Exam 3: Homeostasis Wednesday April 6 100 points Task due dates: April 1 Critical Thinking 3 Mar 29 LoG (Ch7–9)	Regulation & Response Obtaining information, taking action Response against invasion Communication & Control Receiving messages & taking action Organisms need to eat	March 16 March 23	Genetics Bacteria & Fungi
Exam 4: Reproduction Wednesday April 27 100 points Task due dates: April 22 Critical Thinking 4 April 29 LoG (Ch10–end)	Reproduction & Response Genetic information Cell Division Patterns of Inheritance Human Reproduction & Development Reproduction in other organisms Biotechnology	April 6 April 13 April 20	Plants & Algae Invertebrates 1 Invertebrates 2
Final Exam: Wednesday May 11 14h00–16h00 150 points	Diversity is Survival Taxonomy	May 4	Rat dissection