

## BIOLOGY 40S COURSE OUTLINE

*“Statistically, the probability of any one of us being here is so small that you'd think the mere fact of existing would keep us all in a contented dazzlement of surprise. We are alive against the stupendous odds of genetics, infinitely outnumbered by all the alternates who might, except for luck, be in our places.”*

- Lewis Thomas

Welcome to Biology 40S. Here is a list of the major topics that we will be covering this year:

- Genetics
  - 1) Understanding Biological Inheritance, 2) Mechanisms of Inheritance
- Biodiversity
  - 3) Evolutionary Theory and Biodiversity, 4) Organizing Biodiversity, 5) Conservation of Biodiversity

### Your Responsibilities:

- 👉 Show **respect** while in this class (and preferably everywhere else too). This includes respect for your peers, teachers, the classroom, and others' belongings.
- 👉 Show up for every class and be ready to work. Class will begin once the bell has sounded. If you are not in the classroom, you will be considered late. Remember, lateness usually causes you to miss important information and you interrupt the lesson. It also reflects poorly on your character.
- 👉 Bring the following materials to every class: your biology binder, red and blue pens, pencil, eraser, and ruler. You may also be asked to bring other materials for specific activities or assignments. You will use a textbook in class from time to time and will be able to sign it out if necessary.
- 👉 Only touch equipment if instructed to do so.
- 👉 No food or drinks are allowed in the Biology lab, with the exception of tightly lidded to-go mugs and bottled water (try to bring your own reusable bottle instead of using plastic water bottles).
- 👉 It is your responsibility to ask for clarification or help with any of the course material that you may not understand. Do not wait until it is too late to ask for help.
- 👉 When you are absent, YOU are responsible for getting materials and catching up. Always check in with me as soon as you know that you will miss a class or as soon as you return from being away unexpectedly. I will not chase you. More on this topic later in this document.

### Cell Phones/Tablets/Electronic devices

Phones and other devices are a huge distraction in our classroom and, not only do they take away from your ability to focus on biology, they often prevent you from connecting with the people right next to you in that moment.

Cell phones and other devices will **not** be permitted in class during lessons or activities that require all of your attention, ie: discussions, lectures, watching a video, group work, labs, etc. Devices must be put away during these times. I will confiscate any devices that are visible or in use.

Some days I may ask you to use your phone. Other days, you will turn in your cell phones at the start of class. For example, if we have a test or if I believe that cell phones are becoming problematic I will start collecting phones before we begin the lesson.

Pictures and recordings may not be taken of your peers, me, or my materials without explicit permission.

Since I am responsible for designing your learning environment, I am going to make decisions based on what I feel you, my students, need to achieve your highest potential. These decisions about devices must be honoured.

## **Biology 40S Assessment**

### **How your grade will be calculated:**

Knowledge and Understanding	= 70%	}	75% of entire mark
Scientific Skills and Inquiry	= 15%		
Science, Technology, Society, and the Environment	= 15%		
Final Assessment – Exam		}	25% of entire mark

I reserve the right to make changes to the mark breakdown for calculating marks.

### **What are these categories?**

#### **Knowledge and Understanding**

- Outline Gregor Mendel's principles of inheritance, use Punnett squares to solve a variety of inheritance problems using appropriate terminology, use pedigree charts to illustrate and predict inheritance patterns in a family tree, discuss ethical issues related to genetic testing, describe meiosis and how it produces genetic variability in offspring, and explain and identify chromosomal abnormalities from karyotypes.
- Outline significant scientific contributions/discoveries that led to the current understanding of the structure and function of DNA, describe the structure of DNA and how it replicates, compare DNA and RNA, outline the steps involved in protein synthesis, relate the consequences of gene mutation to the final protein product, discuss how gene mutations contribute to variation, investigate an issue related to the application of gene technology in bioresources and/or humans.
- Define the term evolution and explain how it has led to biodiversity, describe and explain the process that led Charles Darwin to formulate his theory of evolution by natural selection, outline the main points of the theory, define the phrase "survival of the fittest," explain how natural selection leads to changes in populations – include different types of natural selection, distinguish between natural and artificial selection, outline how scientists determine changes in a gene pool and how genetic variation in a gene pool can be altered, describe how populations can become reproductively isolated, differentiate between convergent and divergent evolution, distinguish between the two models for the pace of evolutionary change.
- Define the concept of biodiversity, explain why it is difficult to determine the definition of species, describe the dynamic nature of classification and give examples, describe types of evidence used to classify organisms and determine evolutionary relationships, compare the characteristics of the domains of life, compare the characteristics of the kingdoms in the Eukarya domain, investigate a group of organisms.
- Discuss a variety of reasons for maintaining biodiversity, describe strategies used to conserve biodiversity, select and use appropriate tools or procedures to determine and monitor biodiversity in an area, investigate an issue related to the conservation of biodiversity.

**Assessment will be based on test/quizzes, assignments, and research projects.**

Scientific Skills and Inquiry

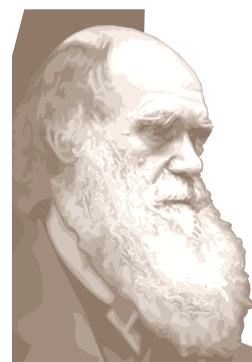
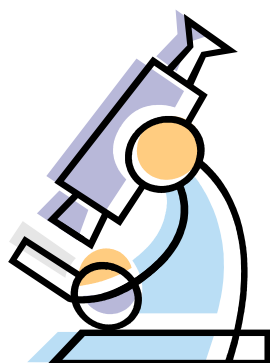
- make predictions/hypotheses about a scientific problem
- able to use equipment to make accurate measurements
- make relevant observations, collect data and information, measure, and make calculations based on measurements
- analyze and interpret data to draw conclusions that explain the data
- identify possible sources of error and suggest ways to make the experiment better
- pose questions and search for explanations
- follow dissection instructions, investigate specimens, identify structures, and relate information back to theory/lessons

**Assessment of the above and related items will be based on lab experiments and other activities.**

Science, Technology, Society, and Environment

- describe scientific and technological developments, past and present, and understand their impact on society and the environment
- identify factors that affect health and explain relationships between lifestyle choices and human health
- apply scientific and technological knowledge to decisions
- clarify issues, critically evaluate all available research, generate and examine possible courses of action, make thoughtful decisions about issues, and examine impacts of the decisions
- identify different views or perspectives based on varying information
- discuss ethical issues related to individuals, society, and the environment
- investigate issues and describe economic implications, a variety of perspectives, and personal/societal/global implications of the issue

**Assessment of the above and related items will be based on tests/quizzes, assignments, and other major projects.**



**Completion of course work (assignments, projects, labs, quizzes, tests, etc.)**

1. Your work needs to be handed in on the due date, unless prior arrangements have been made with me.
2. Any work not submitted by the communicated due date will be considered late and you will need to abide by SCI’s assessment policy (see below). This includes work missing from when you have had any absences, excused or unexcused.
3. If you have been away, you should
  - a. see me immediately upon return to the building to arrange to complete missed work.
  - b. be prepared to write any quizzes or tests upon your return.
4. Late original assignments **will not be accepted** after the procedure below has been carried out.

The following is taken from SCI’s assessment policy and will be adhered to in this course:

**Creating the Grade:**

- Grades will be based only on the demonstration of an individual student’s knowledge and skills of the outcomes for each course:
  - Only items marked by the teacher will determine a student’s grade
  - Grades are based on individual student achievement, not group achievement
- When determining a grade, the teacher will decide whether there is sufficient evidence of achievement. If not, the mark can be reported as an “/N” (incomplete). Teachers will determine with students and parents/guardians a plan for completion of work.

**Establish, communicate, and apply consequences for late and missing work:**

Students must understand that there will be consequences for not completing assignments that provide evidence of learning or for submitting those assignments late. If, after establishing and clearly communicating expectations regarding assignments, setting and communicating timelines for assignments, and supporting student learning using the strategies provided above, student work is still late or missing; teachers will apply the following strategies:

- confer with the student and, where appropriate, with the student's parent/guardians about the reasons for not completing the assignment, and consider the legitimacy of reasons;
- develop an agreement with the student to complete the work;
- require the student to complete missing work during lunch by attending the Assessment Completion Centre (ACC).

If, after completing the steps above, the student does not hand in the assessment by the agreed upon deadline, a zero may be used as a mark as the student has not demonstrated any knowledge or skill of the outcome.

The consequence for not completing work is to complete the work. Late marks will not be subtracted from an assignment as it is purely punitive and doesn’t measure learning. The assignment will either be completed or given a zero.

The full policy is available on the SCI website under “Student Handbook”.

 I have read/followed along and I understand my responsibilities for this course. -----

\_\_\_\_\_  
Student Name (print)

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date