

LISGAR COLLEGIATE INSTITUTE



DEPARTMENT: Science

COURSE NAME: Biology, Grade 12, University Preparation

COURSE CODE: SBI 4U

OVERVIEW

This course provides students with the opportunity for in-depth study of the concepts and processes associated with biological systems. Students will study theory and conduct investigations in the areas of metabolic processes, molecular genetics, homeostasis, evolution, and population dynamics. Emphasis will be placed on achievement of the detailed knowledge and refined skills needed for further study in various branches of the life sciences and related fields.

COURSE CONTENT

Metabolic Processes

Molecular Genetics

Homeostasis

Evolution

Population Dynamics

OVERALL CURRICULUM EXPECTATIONS

By the end of this course, students will:

- describe the structure and function of the macromolecules necessary for the normal metabolic functions of all living things, and the role of enzymes in maintaining normal metabolic functions;
- conduct laboratory investigations into the transformation of energy in the cell, including photosynthesis and cellular respiration, and into the chemical and physical properties of biological molecules;
- explain ways in which knowledge of the metabolic processes of living systems can contribute to technological development and affect community processes and personal choices in everyday life.
- explain the concepts of gene and gene expression and the roles of DNA, RNA, and chromosomes in cellular metabolism, growth, and division, and demonstrate an awareness of the universality of the genetic code;
- explain, through laboratory activities and conceptual models, processes within the cell nucleus;
- describe some of the theoretical issues surrounding scientific research into genetic continuity; the general impact and philosophical implications of the knowledge gained; and some of the issues raised by related technological applications.
- describe and explain the physiological and biochemical mechanisms involved in the maintenance of homeostasis;
- analyse, through experiments and the use of models, the feedback mechanisms that maintain chemical and physical homeostasis in animal systems;
- analyse how environmental factors (physical, chemical, emotional, and microbial) and technological applications affect/contribute to the maintenance of homeostasis, and examine related societal issues.
- analyse evolutionary mechanisms, and the processes and products of evolution;
- evaluate the scientific evidence that supports the theory of evolution;
- analyse how the science of evolution can be related to current areas of biological study, and how technological development has extended or modified knowledge in the field of evolution.
- analyse the components of population growth, and explain the factors that affect the growth of various populations of species;

- investigate, analyse, and evaluate populations, their interrelationships within ecosystems, and their effect on the sustainability of life on this planet;
- evaluate the carrying capacity of the Earth, and relate the carrying capacity to the growth of populations, their consumption of natural resources, and advances in technology.

LEARNING SKILLS

The development of sound learning skills is essential to the success of our students. Teachers and students will work together to understand and further the development of student learning skills in the areas of initiative, work habits, organization, team work, and independent work. Teachers report on learning skills on the midterm and final report cards.

ASSESSMENT METHODS

Students' understanding of the course material will be assessed and evaluated using unit tests, quizzes, in-class and take-home assignments, lab activities and reports, a summative project, and a final exam. Marks from the various assignments will be broken down and recorded in the following categories. Please refer to the Lisgar Assessment and Evaluation Policy.

EVALUATION

Course Work (70%)

1. Application	10 %
2. Knowledge/Understanding	25 %
3. Communication	10 %
4. Thinking/Inquiry/Problem Solving	25 %

Summative (10%)

Summative Due Date(s): week of January 12, 2009

Exam (20%)

The final exam will cover the entire course.

ATTENDANCE

If you are absent from class, you are expected to catch up what you missed and complete any relevant homework. When you return to class, you must show your teacher an Absence Verification Form.

If you know in advance that you will be absent for a test, please see your teacher **before** the scheduled test date to arrange an alternate time to write it.

If you are unexpectedly absent for a valid reason on the day of a scheduled test, please let your teacher know why. When you return to class, remember to show an Absence Verification Form from your homeroom teacher and a note from your parents indicating that they are aware you missed the test. An **unjustified absence** for a test may result in a **mark of zero**.

SUPPLEMENTARY NOTES

Text: Nelson Biology 12 (Thomson Nelson)

Each Student will be assigned a textbook. If it is lost or damaged, the replacement cost is \$111.25.

Texts are to be covered with sturdy paper.

Prerequisite: Biology, Grade 11, University Preparation

Homework:

The importance of regular completion of homework cannot be overemphasized.

* Record homework assignments in your agenda at the end of each class.

* Homework must be completed before the end of next day's class.

Extra help: See your teacher about arranging a mutually convenient time for extra help.

Please see page 25 in the Lisgar Student Planner under the heading "Extra help In A Subject".