

BIOLOGY (SBI3U) COURSE OUTLINE

Course Title: Biology, Grade 11, University Preparation

Ministry Course Code: SBI3U

Name of School: Lighthouse Academy

Department: Science

Course Developer: Dr. A B M Shamsur Rahman OCT

Course Development Date: February, 2019

Course Revision Date: January, 2016

Course Length: One semester (110 hrs)

Credit Value: 1.0

Secondary Curriculum Document: The Ontario Curriculum Grades 11 and 12 Science, 2008 (Revised)

Pre-requisite: Science, Grade 10, Academic

Course Description/Rational:

This course furthers students' understanding of the processes that occur in biological systems. Students will study theory and conduct investigations in the areas of biodiversity; evolution; genetic processes; the structure and function of animals; and the anatomy, growth, and function of plants. The course focuses on the theoretical aspects of the topics under study, and helps students refine skills related to scientific investigation.

Curriculum Strands and Expectations

The expectations identified for the course describe the knowledge and skills that students are expected to develop and demonstrate in their class work, on tests, and in various other activities on which their achievement is assessed and evaluated.

Overall Curriculum Expectations:

By the end of this course, students will:

A. Scientific Investigation Skills and Career Exploration

- A1. demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating);
- A2. identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

B. Diversity of Living Things

- B1. analyse the effects of various human activities on the diversity of living things;
- B2. investigate, through laboratory and/or field activities or through simulations, the principles of scientific classification, using appropriate sampling and classification techniques;
- B3. demonstrate an understanding of the diversity of living organisms in terms of the principles of taxonomy and phylogeny.

C. Genetic Processes

- D1. evaluate the importance of some recent contributions to our knowledge of genetic processes, and analyse social and ethical implications of genetic and genomic research;
- D2. investigate genetic processes, including those that occur during meiosis, and analyse data to solve basic genetics problems involving monohybrid and dihybrid crosses;

- D3. demonstrate an understanding of concepts, processes, and technologies related to the transmission of hereditary characteristics.

D. Evolution

- C1. analyse the economic and environmental advantages and disadvantages of an artificial selection technology, and evaluate the impact of environmental changes on natural selection and endangered species;
- C2. investigate evolutionary processes, and analyse scientific evidence that supports the theory of evolution;
- C3. demonstrate an understanding of the theory of evolution, the evidence that supports it, and some of the mechanisms by which it occurs.

E. Animals: Structure and Function

- E1. analyse the relationships between changing societal needs, technological advances, and our understanding of internal systems of humans;
- E2. investigate, through laboratory inquiry or computer simulation, the functional responses of the respiratory and circulatory systems of animals, and the relationships between their respiratory, circulatory, and digestive systems;
- E3. demonstrate an understanding of animal anatomy and physiology, and describe disorders of the respiratory, circulatory, and digestive systems.

F. Plants: Anatomy, Growth, and Function

- F1. evaluate the importance of sustainable use of plants to Canadian society and other cultures.
- F2. investigate the structures and functions of plant tissues, and factors affecting plant growth;
- F3. demonstrate an understanding of the diversity of vascular plants, including their structures, internal transport systems, and their role in maintaining biodiversity.

Unit Titles

The course content has been divided into the following units of study, which has been developed to achieve the expectations outlined in Biology Grade 11 curriculum guideline.

Outline of the Course Content

Unit	Title	Hours
1	Diversity of Living Things	24
2	Genetic Processes	23
3	Evolution	23
4	Animals: Structure and Function	17
5	Plants: Anatomy, Growth, and Function	23
	TOTAL HOURS	110

* “Scientific Investigation Skills and Career Exploration” will be incorporated throughout the above units

Teaching Strategies

A wide variety of instructional strategies will be used to provide learning opportunities that accommodate a range of learning styles and interests. These include:

Direct instruction	Individual work/ team work	Computer aided demonstrations
Laboratory activities	Problem solving	Model construction
Multimedia presentations	Issue analysis and presentation	Discussion/ Question and answer sessions.

Learning Strategies

To ensure student's skills such as the ability to work independently or in a team, efficient work habits, study skills and initiative, a variety of learning strategies will be used in order to obtain optimal understanding and application.

Brainstorming Webs	Discussion
Cooperative Learning	Independent Study
Role-playing	Work sheets
Researching	Reports

Learning Skills

The following criteria will be used to assess Learning Skills:

- (i) Work habits (ii) Initiative (iii) Team Work (iv) Organization (v) Works independently

Assessment

For student success various assessment tools will be used such as a checklist, rubric, to assess their knowledge and skills. These criteria will be to ensure assessment as learning and assessment for learning (Growing Success- ministry of education) that needs to take place and will include strategies such as sharing learning goals and success criteria, providing feedback in relation to goals, and developing students' ability to self-assess – as a way of increasing student's engagement in and commitment to learning.

Evaluation of Student Performance

Evaluation will be based on assessment of learning for grading and reporting. Evidence of student achievement for evaluation will be collected over time from three different sources – teacher observation, conversation, and student products using multiple sources of evidence to ensure the reliability and validity of the evaluation of student learning. Evaluation will be focused on student's achievement of the overall expectations based on the four Ministry of Education achievement categories: Knowledge and Understanding, thinking, communication and application. A single evaluation may include one, more than one, or all of the categories in the weighting listed below:

Category	Description	Weighting
Knowledge and Understanding	Subject-specific content acquired in course Assignment completion	30%
Thinking/Inquiry	Critical/creative thinking processes as follows: <ul style="list-style-type: none"> • Processing Skills (analyzing, evaluating) • Critical thinking processes (problem solving, decision making, research) 	20%
Communication	Conveying of meaning: Presentations, Participation, Written: reports portfolio Visual: Multimedia Presentation	25%
Application	The use of biological knowledge and skills to make connections with texts: Biology related problem solving, drawing diagrams of biological processes.	25%

Final Grade:

Term work will be 70% of the final evaluation and conducted throughout the course in all the four categories. Students will use a variety of checklists, rubrics, rating scales, marking schemes, provided by the teacher from time to time.

Final evaluation of **30%** will comprise an ISU of **10%**, and an exam of **20%**, which will incorporate the work of the whole term, meeting all the overall expectations of the course in each achievement category.

Percentage of Final Grade		Evaluation Components
70%	40 %	Test (Student Product) (Tests of 5% each on the following units) <ol style="list-style-type: none"> 1. Diversity of Living Things (2) 2. Genetic Processes (2) 3. Evolution (2) 4. Plants: Anatomy, Growth, and Function (2)
	30%	Assignments, Projects, and Labs (Observation, Conversation, Student Product) <ol style="list-style-type: none"> 1. Diversity of Living Things (Project) (5%) 2. Genetic Process (Assignment) (5%) 3. Plant Growth (Project) (5%) 4. Evolution (Assignment) (5%) 5. Animals: Structure and Function (Lab) (10%)
30%	10%	ISU (Observation, Conversation, Student Product) Research project on topics related to Animals: Structure and Function based on Ministry Guidelines Reports and Presentation
	20%	Final Exam (Student Product)

Rules and Regulations

1. **Plagiarism/Dishonest Activity:** It is the responsibility of every student to ensure that all assignments and projects which are to be evaluated are original, personal works and are accurately documented as outlined by the teacher. Examples of plagiarism are:
 - the submission of someone else's work (in whole or in part) as your own; giving work to someone else to be copied and submitted; directly copying an existing work and claiming it is your own original creation.
 - buying or selling of assignments and projects
 - submitting work from one course as work in another course

Consequences of Plagiarism

- the teacher will inform parents/guardians that the student has submitted work which is not original.
 - student caught plagiarizing in any other forms as well, will get a straight zero for that assignment, project or test as a penalty for cheating. It will be teacher's discretion to allow/decline the student to resubmit the assignment and project after having discussion with parents and approval/disapproval from the principal.
2. **Conduct:** Students must follow the school's Code of Conduct, participate fully in discussions, and complete all assignments in time to the best of their ability.
 3. **Responsibility:** It is also the student's responsibility to make up for any missed work during their absences.

Program and Planning

For an effective program related to biology, a variety of activities will be conducted that will integrate expectations from different strands and provide for the explicit teaching of knowledge and skills. It will provide frequent opportunities for students to rehearse, practice, and apply skills and strategies, and to make their own choices. These considerations may include, but not be limited to:

- Provide effective instructional approaches and learning activities draw on students' prior knowledge, capture their interest, and encourage meaningful practice both inside and outside the classroom.
- Provide students with opportunities to learn in a variety of ways – individually, cooperatively, independently, with teacher direction, through hands-on experiences, and through examples followed by practice.
- Provide activities and challenges that actively engage students in inquiries that honor the ideas and skills students bring to them, while further deepening their conceptual understandings and essential skills.
- Provide students with opportunities to use of a variety of equipments and materials that helps deepen and extend their understanding of scientific concepts and further extends their development of scientific investigation skills.
- Make sure to follow safe practices at all times and communicate safety expectations to students in accordance with school board and Ministry of Education policies and Ministry of Labour regulations.
- Motivate students to examine the opinions and values of others, detect bias, look for implied meaning in their readings, and use the information gathered to form a personal opinion or stance.
- Provides opportunities for students to engage in various oral activities in connection with expectations in all the strands, such as brainstorming to identify what they know about the new topic they are studying, discussing strategies for solving a problem, presenting and defending ideas or debating issues, and offering critiques of models and results produced by their peers.
- Encourage students to use ICT to support and communicate their learning.
- Motivate students to develop a variety of important capabilities, including the ability to identify issues, conduct research, carry out experiments, solve problems, present results, and work on projects both independently and as a team.
- Provide students with opportunities to explore various careers related to the areas of science under study and to research the education and training required for these careers.

Materials

Subject binder, stationary set; pen, pencils, eraser, sharpener, rule, geometry set, lined/grid graph paper, blank paper

Resources

A number of resources are included in this profile. Each activity lists specific resources that may include:

- 1. Text book:** Biology 11 McGraw-Hill Ryerson, ISBN 0-07-091580-6
 - 2. Handouts:** Relevant handouts will be given to students.
 - 3. Multimedia and presentation packages:** will be presented from time to time.
 - 4. Websites:** www.mcgrawhill.com/links
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Acknowledgment

I have read and understood the course expectations, learning skills, assessment and evaluation strategies, and school rules for this Biology 11 course outline.

Student's Name: _____

Student's Signature: _____ **Date:** _____

Parent's Signature: _____ **Date:** _____