LIBERTY UNIVERSITY | ONLINE ACADEMY

Life Science

SCI0700

Course Description

Life science is an amazing journey that allows students to know God better through the study of His creation. This life science course will expand upon previous learning and set the foundation for science in high school. Students need to know the better they learn and understand the concepts presented in the life science course, the easier and more rewarding their high school courses will be. The student's understanding should encompass both the micro and macro aspects of life, and this life science course includes both. The major concepts covered are scientific inquiry, cells, organization of life, classification, cell processes, population dynamics, differences between and effects of biotic and abiotic factors, ecosystem dynamics, genetics and its applications, and change over time (micro-evolution vs. macro-evolution).

Rationale

Students at this level should show development in their ability and understanding of scientific inquiry. The units contain experiments and projects that seek to develop a deeper conceptual meaning for the student and actively engage the student. The continued exposure of science concepts and scientific inquiry will serve to improve the student's skill and understanding as well as teach the student how his or her life is affected by these factors and how he or she affects the environment in which they live. Scientific inquiry will be introduced in module one, but will be seen and utilized throughout a series of activities through this course. The goal is to ensure that each student has a thorough understanding and feel for the entire process of scientific inquiry.

Prerequisite

None

Biblical Integration Outcomes

A. The student will identify and describe Creation and the universe from a biblical worldview.

Measurable Learning Outcomes

A. The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by conducting investigations.
B. The student will investigate and understand that all living things are composed of cells.

C. The student will investigate and understand that living things show patterns of cellular organization.
D. The student will investigate and understand how organisms can be classified.
E. The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life.
F. The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment.
G. The student will investigate and understand that interactions exist among members of a population.
H. The student will investigate and understand interactions among populations in a biological community.
I. The student will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem.
J. The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic, change over time, and respond to daily, seasonal, and long-term changes in their environment.
K. The student will investigate and understand the relationships between ecosystem dynamics and human activity.
L. The student will investigate and understand that organisms reproduce and transmit genetic information to new generations.

Course Materials

See LUOA's Systems Requirements for computer specifications necessary to operate LUOA curriculum. Also view Digital Literacy Requirements for LUOA's expectation of users' digital literacy.

- Note: Embedded YouTube videos may be utilized to supplement LUOA curriculum. YouTube videos are the property of the respective content creator, licensed to YouTube for distribution and user access. As a non-profit educational institution, LUOA is able to use YouTube video content under the YouTube Terms of Service. For additional information on copyright, please contact the Jerry Falwell Library.

Course Grading Policies

The student's grades will be determined according to the following grading scale and assignment weights. The final letter grade for the course is determined by a 10-point scale. Assignments are weighted according to a tier system, which can be referenced on the Grades Page in Canvas. Each tier is weighted according to the table below. Items that do not affect the student's grade are found in Tier 0.

Grading Scale	
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

Assignment Weights	
Tier 0	0%
Tier 1	25%
Tier 2	35%
Tier 3	40%

In order for students to receive credit for a course, the following conditions have to be met:

1. All semester exams and module tests have to be completed,
2. All Tier 3 projects or papers have to be completed, and
3. Fewer than 10 zeros exist in the gradebook for blank submissions in a full credit course and 5 zeros for blank submissions in a semester course.

Course Policies

Students are accountable for *all* information in the Student Handbook. Below are a few policies that have been highlighted from the Student Handbook.

Types of Assessments

To simplify and clearly identify which policies apply to which assessment, each assessment has been categorized into one of four categories: Lesson, Assignment, Quiz, or Test. Each applicable item on the course Modules page has been designated with an identifier chosen from among these categories. Thus, a Quiz on the American Revolution may be designated by the title, "1.2.W *Quiz*: The American Revolution." These identifiers were placed on the Modules page to help students understand which Honor Code and Resubmission policies apply to that assessment (see the Honor Code and Resubmission policies on the pages that follow for further details).

- **Lesson:** *Any item on the Modules page designated as a "Lesson"*
  These include instructional content and sometimes an assessment of that content. Typically, a Lesson will be the day-to-day work that a student completes.
- **Assignment:** *Any item on the Modules page designated as an "Assignment"*
  Typical examples of Assignments include, but are not limited to, papers, book reports, projects, labs, and speeches. Assignments are usually something that the student should do his or her best work on the first time.
- **Quiz:** *Any item on the Modules page designated as a "Quiz"*
  This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Quizzes cover a smaller amount of material than Tests.
- **Test:** *Any item on the Modules page designated as a "Test"*
  This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Tests cover a larger amount of material than Quizzes.

Resubmission Policy

Students are expected to submit their best work on the first submission for every Lesson, Assignment, Quiz, and Test. However, resubmissions may be permitted in the following circumstances:

- **Lesson:** Students are automatically permitted two attempts on a Lesson. Students may freely resubmit for their first two attempts without the need for teacher approval.
- **Assignment:** Students should do their best work the first time on all Assignments. However, any resubmissions must be completed before the student moves more than one module ahead of that Assignment. For example, a student may resubmit an Assignment from Module 3 while in Module 4, but not an Assignment from Modules 1 or 2. High School students may not resubmit an Assignment without expressed written permission from the teacher in a comment.
- **Quiz:** Students may NOT resubmit for an increased grade.
- **Test:** Students may NOT resubmit for an increased grade.

If a student feels that he or she deserves a resubmission on a Lesson, Assignment, Quiz, or Test due to a technical issue such as a computer malfunction, the student should message his or her teacher to make the request, and that request will need to be approved by a Department Chair.

Consequences for Violations to the Honor Code

Every time a student violates the Honor Code, the teacher will submit an Honor Code Incident Report. The Student Support Coordinator will review the incident and allocate the appropriate consequences. Consequences, which are determined by the number of student offenses, are outlined below:

- **Warning:** This ONLY applies to high school Lessons and elementary/middle school Assignments and Lessons. Students should view these actions as learning opportunities.
    - **Lessons:** A zero will be assigned for the question only.
    - **Elementary/Middle School Assignment:** The student must redo his or her work; however, the student may retain his or her original grade.
- **1st Offense:**
    - **Lesson, Quiz, or Test:** The student will receive a 0% on the entire assessment.
    - **Assignment:** The student will either:
        - Receive a 0% on the original assignment
        - Complete the Plagiarism Workshop
        - Retry the assignment for a maximum grade of 80%
- **2nd Offense:** The student will receive a 0% and be placed on academic probation.
- **3rd Offense:** The student will receive a 0% and the Faculty Chair will determine the consequences that should follow, possibly including withdrawal from the course or expulsion from the academy.

Scope and Sequence

Life Science

Module 1: The Nature of Science
Week 1: What is Scientific Knowledge?
Week 2: Scientific Investigations
Week 3: Tools of a Scientist

Module 2: Cell Structure & Development
Week 4: Scientist, Microscopes, and Cell Theory
Week 5: Cell Structure and Function
Week 6: Cell Structure and Organization

Module 3: Cells & Heredity
Week 7: Homeostasis and Cell Process
Week 8: Photosynthesis and Cellular Respiration
Week 9: Mitosis and Meiosis

Module 4: Heredity
Week 10: Reproduction and Genetics
Week 11: How Genetic Information is Passed On
Week 12: How Traits Can Change

Module 5: Evolution & Creationism
Week 13: Populations
Week 14: Evolution or Creationism
Week 15: Theory of Evolution
Week 16: ”Evidence” of Evolution
Week 17: History of Life on Earth: Evolution vs. Creation

Module 6: Semester Review
Week 18: Semester Review and Exam

Module 7: Bacteria, Protist, & Fungi
Week 19: Introduction to Classification
Week 20: Archaea, Bacteria, and Viruses
Week 21: Protist
Week 22: Fungi/Module Test

Module 8: Plants & Animals
Week 23: Plants
Week 24: Animals
Week 25: Animal and Plant Adaptations

Module 9: Ecology & Energy Transfer
Week 26: Ecology
Week 27: Energy Cycles
Week 28: Energy Transfer
Week 29: Niches

Module 10: Populations & Communities
Week 30: Four Cold Land Biomes
Week 31: Four Warm Land Biomes
Week 32: Aquatic Ecosystems
Week 33: Biome Project and Module Test

Module 11: Human Activity
Week 34: Changes in Ecosystems and Human Activity
Week 35: Call to Action

Module 12: Semester Review and Final Exam
Week 36: Semester Review and Exam