



Course Syllabus

Course Number | Name: SCI143NT – Scientific Inquiry: Life Sciences with Lab

Course Credits: 3

Course Duration: 8 weeks

Course Description:

Through Scientific Inquiry: Life Sciences, students will gain scientific literacy. Students will apply scientific methodology and problem-solving in the study of biological concepts through a variety of experiments, activities, and discussions. The course examines the origin of life, the classification of life, the characteristics of life, cellular processes, body systems, genetics, and the omnipotence of God, the Creator. Throughout the course, emphasis will be placed on the societal relevance and application of biological concepts.

Course Learning Outcomes (CLOs):

#	CLOs	Bloom's*
1	Describe the basic functions of the biomolecules and biological concepts that are discussed in class.	2
2	Explain the concepts included in the Central Dogma of Biology and how those relate to genetics.	2
3	Explain the basic principles that define how the various systems of the body (respiratory, circulatory, digestive, nervous, endocrine, and reproductive systems) function and maintain homeostasis and explain the processes of some of the abnormalities and illnesses that result when these systems malfunction.	2
4	Apply the steps involved in the scientific method to a specific problem.	3
5	Critically interpret experimental results from a variety of sources, including experiments done in the lab and tables and graphs from other experiments by using scientific reasoning skills.	4
6	Evaluate biological concepts and current science news articles using scientific literacy skills and the Tenets of the Nature of Science.	5
7	Critically evaluate the role of science in the Christian faith, describing how God's omniscience and majesty is demonstrated at each level of life.	5

*Indicates Bloom's Taxonomy cognitive domain level.

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Biblical Worldview Integration Plan:

In this class, we will explore the biological world that God created, recognizing the intricacy of his work and delving into the ethical issues in biology that must be wrestled with from a Biblical worldview. Science and faith are not at odds, nor should they be compartmentalized. Instead, they complement each other. Through discussion, lab exercises, and current event assignments, we will learn about God’s creation, the scientific tools and mind God has given us, and how to steward God’s creation, as well as analyze current scientific findings (and their implications) from our Biblical worldview.

Required Media:

Fowler, S., Roush, R., & Wise, J. (April 25, 2013) *Concepts of Biology*. XanEdu Publishing Inc. ISBN-13: 978-1-938168-11-6. Hardcover, 978-1-50669-653-9. Paperback, 978-1-947172-03-6. Digital.

Carolina Biological Intro to Biology Distance Learning Lab Kit: The Order link is in the course Syllabus.

Grading Grid:

Assessments (# in parentheses) - # pts. each if > 1	Total Points
Discussions (8) - 25 pts. each	200
Weekly Quizzes (8) - 25 pts. each	200
Weekly Labs (7) - 40 pts. each	280
Current Event Assignments (3) – 40 pts. each	120
Papers (3) – 10 pts. each	30
Creative Project	50
Final Exam	120
Total Points:	1,000

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Course Schedule:

Week 1

Media:

1. Fowler, et. al, Chapter 1, Section 1.2
2. Philosophy of Science Video
3. Characteristics of Life Video
4. Fowler, et. al, Chapter 1, Section 1.1
5. Video
6. Lab Kit: Laboratory Safety Manual, pages 2-4 and 10-11
7. Lab Kit: DL Lab Safety Contract
8. CER (Claim, Evidence, Reasoning) in Biology Video
9. Introduction to Faster Plop, Plop, Fizz Lab Video

Assignments:

1. Assignment 1-1 Quiz #1
2. Assignment 1-2 DL Lab Safety Contract - See Instructions in the course
3. Assignment 1-3 Lab #1 - See Instructions in the course
4. Wk1 Discussion - See Instructions in the course

Week 2

Media:

1. Fowler, et. al, Chapter 2, Sections 2.1 and 2.2
2. Chemistry and Water Video
3. Water Characteristics Demonstration Video
4. Fowler, et. al, Chapter 2, Section 2.3
5. Macromolecules: Carbohydrates and Proteins Video
6. Protein Formation/Denaturation Video
7. Macromolecules: Lipids and Nucleic Acids Video
8. Fowler, et. al, Chapter 16, Section 16.2
9. The Digestive System and its relation to Macromolecules Video

Assignments:

1. Assignment 2-1 Quiz #2
2. Assignment 2-2 Lab #2 - See Instructions in the course
3. Assignment 2-3 Current Event Assignment #1 - See Instructions in the course
4. Wk2 Discussion - See Instructions in the course

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Week 3

Media:

1. Fowler, et. al, Chapter 3
2. Introduction to Cells Video
3. Transport Across a Membrane Video
4. Macromolecules: Lipids and Nucleic Acids Video
5. Osmosis Case Study (for Discussion Board, part 1) PDF
6. Eukaryotic Cells Video
7. Varied usage of flagella and cilia Video
8. Cell Networks Video
9. Do Fish Drink Water? Video

Assignments:

1. Assignment 3-1 Quiz #3
2. Assignment 3-2 Lab #3 - See Instructions in the course
3. Assignment 3-3 Paper #1 - See Instructions in the course
4. Wk3 Discussion - See Instructions in the course

Week 4

Media:

1. Fowler, et. al, Chapter 13, Section 13.1
2. Bacteria Video
3. Pickles, Probiotics, and Why Rotten Food is Good For You Video
4. Superbugs and Antibiotic Resistance Video
5. Fowler, et. al, Chapter 13, Section 13.4
6. Fowler, et. al, Chapter 17, Section 17.1
7. Fungi and Viruses Video
8. Why Can Mosquitos Transmit Zika But Not the Flu? Video
9. Fowler, et. al, Chapter 17, Sections 17.2-17.3
10. Immune System Video
11. Epidemiology Video

Assignments:

1. Assignment 4-1 Quiz #4
2. Assignment 4-2 Lab #4 - See Instructions in the course
3. Assignment 4-3 Current Event Assignment #2 - See Instructions in the course
4. Assignment 4-4 Paper #2 - See Instructions in the course
5. Wk4 Discussion - See Instructions in the course

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Week 5

Media:

1. Fowler, et. al, Chapter 4
2. Chapter 4 – Where does the energy for life come from? Video
3. Enzymes (UPDATED) Video
4. Cellular Respiration (UPDATED) Video
5. Fermentation Video
6. Lab Introduction Video

Assignments:

1. Assignment 5-1 Quiz #5
2. Assignment 5-2 Lab #5 - See Instructions in the course
3. Assignment 5-3 Paper #3 - See Instructions in the course
4. Wk5 Discussion - See Instructions in the course

Week 6

Media:

1. Fowler, et. al, Chapter 14
2. Plant Diversity and Structures Video
3. Fowler, et. al, Chapter 5
4. Photosynthesis Video
5. Photosynthesis (UPDATED) Video
6. Where do plants get their mass? Video
7. Introduction to lab Video

Assignments:

1. Assignment 6-1 Quiz #6
2. Assignment 6-2 Lab #6 - See Instructions in the course
3. Assignment 6-3 Current Event Assignment #3 - See Instructions in the course
4. Wk6 Discussion - See Instructions in the course

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Week 7

Media:

1. Fowler, et. al, Chapter 6, Sections 6.1-6.2
2. Fowler, et. al, Chapter 7
3. Fowler, et. al, Chapter 8
4. Cell Cycle Video
5. Mitosis Video
6. Mitosis video Video
7. Meiosis Video
8. Meiosis video Video
9. Mitosis and Meiosis Comparison Video
10. Modifications from Meiosis Video
11. Genetics Video

Assignments:

1. Assignment 7-1 Quiz #7
2. Assignment 7-2 Lab #7 - See Instructions in the course
3. Wk7 Discussion - See Instructions in the course

Week 8

Media:

1. Fowler, et. al, Chapter 19
2. Fowler, et. al, Chapter 20, Section 20.1
3. Fowler, et. al, Chapter 21
4. Ecology Video
5. Population Ecology: The Texas Mosquito Mystery – Crash Course Ecology #2 Video
6. The threat of invasive species – Jennifer Klos Video
7. Australia’s Most Destructive Creature Video
8. How Lionfish Took Over the Mediterranean Sea Video
9. Conservation and Restoration Ecology: Crash Course Ecology #12 Video
10. How Wolves Change Rivers Video
11. How Amphibians Restore Balance to the Land Video
12. De-extinction: a game-changer for conservation biology: Stanley Temple at TEDxDeExtinction Video
13. De-extinction may be inevitable, but we should still ask questions | Amy Fletcher | TEDxChristchurch Video

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Assignments:

1. Assignment 8-1 Quiz #8
2. Assignment 8-2 Creative Project - See Instructions in the course
3. Assignment 8-3 Final Exam
4. Wk8 Discussion - See Instructions in the course