**St. Athanasius Academy**

**High School Biology Syllabus**

**Fall and Spring of 2022/2023**

**Tuesday and Thursday at 11:00am**

**Instructor:**

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**Office hours: 9:00am Tuesday and Thursday by appointment**

**Rationale**

**The St. Athanasius Academy High School Biology course is designed to build a strong foundation in this basic, but vital, life science from an Orthodox perspective. This year long curriculum will cover each aspect of biology from the perspective of what makes something alive. Every organism to every species must fulfill the four characteristics of living things. Can they reproduce, maintain homeostasis, grow and develop and respond to their environment. We will view everything through the lens of what make something alive and its relationship to God’s creation. We will take a deep dive into cells, tissues, organs, organ systems and functional organisms. We will be looking at everything from simple cellular microorganism to plants, animals and the human body. We will also review and put into perspective the different theories of evolution, creationism, intelligent design, asexual and sexual reproduction and ecology from an Orthodox view.**

**Course Aims and Outcomes**

1. **Aims**

To understand the foundations of formation of life in this world

To understand the both the scientific method and God’s revelation in life

To write and speak about the material during class time

To answer the question on quizzes and exams.

1. Specific Learning Outcomes

By the end of this course, students will:

1. Use biology terminology to speak in normal conversation about the relationship of all live.
2. To have information available to engage in reasoned discourse about biological facts that contribute to positive growth and a prosperous life.
3. To understand the repeating process the DNA plays in every cell of your body
4. To know the interdependence of all organs within the human body
5. To map the similarities and difference between plants and animals.

**Format and Procedures**

1. Each class will start at 11:00am EST each Tuesday and Thursday for 16 classes in each semester for 8 weeks.
2. The exception is for stated school closures on Orthodox feast and fast days.
Attendance will be taken and a student will only be marked as present if their video and audio functions are on and you can respond with the word, “present”. Unless you are taking a bathroom break, your camera must be on or you will be considered “absent” from the class.
3. If a student is late signing into the class, and we have moved on to presentation material (videos and PowerPoint presentation), the student must wait until I can view the waiting room function and admit you to the class.
4. The first part of the class is reserved for questions and answers about the previous class material.
5. Participation will be factored into the grading for that week.
6. Lecture will take up a majority of the class to include videos and PowerPoint
presentations provided to you as links under the resource section of your class page.
7. Questions will be asked throughout the lecture to test your attention and comprehension of assigned material.
8. Questions can be asked at any time, but your microphone must be off and use of the screen hand or your hand must be used to be called on. I may not see questions in the “chat” section and participation is important.
9. Homework and test results will be discussed at the end of the class.
10. Quizzes and tests will be given at the end of each discussion on a particular Process some of the quizzes will be verbal by asking one question to each of the students. Or multiple questions asked in written format (usually 10 questions per test).
11. If the assignment is a research question, results should be submitted prior to the start of the next class, unless stated.

**My Assumptions**The study of Biology is a window into how God infuses His life giving presence (The Holy Spirit) into every living thing. The journey we will take, from the form and function of cell to the integration and synergy of the human organ systems will focus on “*energia*”. This is the production and use of energy; both naturally occurring and internally generated. Positive, life sustaining energy allows all creatures to grow, develop, reproduce, respond and maintain a balanced relationship with all other living things. The absence of this God infused energy results in the disintegration and death of all life.

We will also be looking at some the hard questions that students will face through social and scientific theories, hypothesis and assumptions. Questions about creationism vs. evolution and intelligent design will be address through discussion, research and mathematics. Issues of asexual and sexual reproduction, male and female roles in biology; and even the origins and extinctions of certain phylum and species will be addressed as a class study and discussion.

All life is interdependent and requires being in relationship within and without of its self. This interdependence adapts and responds to macro and micro environments in order to support growth, replication and awareness in this world which results in some amazing life forms. It will be the goal of this class to point out the reoccurring patterns and principles that make the study of living things so fascinating and necessary. We will start with the most basic patterns and build upon these themes until we have a full orchestra of simultaneous function and structures operating as one organism.

**Course Requirements**

1. Each students will need to master the vocabulary list in each section and understand the basic scientific principles behind each level of function
2. Course textbooks

**Required Text**

* Biology (Foundation Edition), by Miller & Levine, Pearson 2010.

ISBN-13: [9780133669510](https://www.alibris.com/search/books/isbn/9780133669510)

Recommended text: (optional)

* Biology Workbook (Foundation Edition), by Miller & Levine, Pearson 2010

ISBN-13: 978-0133687187

**Expectations for Parents**

1. Set aside a calm, quiet, distraction-free space for your child(ren) to work every day.
2. Ensure virtual learning equipment is available and charged.
3. Establish routines and expectations and a basic schedule for completing classwork.
4. Help students ‘own’ their learning.
5. Check Edmodo for communications from teachers and help students print off resources
that are provided.
6. Stay abreast of teacher feedback in the form of grades or other messages.
7. Proctor tests, quizzes, or other assessments as scheduled by the teacher. Parents ensure
academic integrity because they are on the “live” side of the screen.
8. Communicate with teachers regularly via email or Edmodo regarding any questions or issues that arise.
9. If your child is having trouble completing work, email teachers to schedule a time for an online meeting.

**Grading Procedures**
Grades will be weighted on the following scale:
(a) 100-90%
(b) 90-80%
(c) 80-70%
(d) 70-65%

(e) Class participation will make up 30% of the semester’s final grade
(f) Assignments and tests submitted late will be accepted without penalty prior to the following class. Material submitted after a second class period will count only 50% (F)

**Academic Integrity**

1. Each student in this course is expected to abide by the Cornell University Code of Academic
2. Integrity. Any work submitted by a student in this course for academic credit will be the student's own work.
3. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. One great way to assess what you know is to teach the idea to a peer! You may also work together on problem sets and give "consulting" help to or receive "consulting" help from your peers. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in any form (e.g. email, Word doc, Box file, Google sheet, or a hard copy). Assignments that have been previously submitted in another course may not be submitted for this course.
4. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty
for violation of this Code can also be extended to include failure of the course and University disciplinary action.
5. During examinations, you must do your own work. Talking or discussion is not permitted during
the examinations, nor may you compare papers, copy from others, or collaborate in any way.
6. Any collaborative behavior during the examinations will result in failure of the exam and

**Tentative Course Schedule for Fall of 2022**

**Date Topics Reading assignment Reference material**

**8/16/22 Orientation Table of Contents Syllabus**

8/18/22 Orientation Table of Contents Syllabus

8/23/22 The Science of Biology Chapter 1.1-1.2 PowerPoint

8/25/22 The Science of Biology Chapter 1.2-1.3 Video review

8/30/22 The Chemistry of Life Chapter 2.1-2.2 PowerPoint

9/01/22 The Chemistry of Life Chapter 2.3-2.4 Video Review

9/06/22 Energy Producers Chapter 3.1-3.2 Handouts

9/08/22 No Class *Nativity of the Theotokos*

9/13/22 Terrestrial Ecosystems Chapter 4.2-4.3 Handouts

9/15/22 Aquatic Ecosystems Chapter 4.5 Handouts

9/20/22 Creationism vs. Evolution Handouts Video Review

9/22/22 Intelligent Design Handouts/Lecture Video Review

9/27/22 Cell Structure and Function Chapter 7.1-7.2 PowerPoints

9/29/22 Transport and Homeostasis Chapter 7.3-7.4 Handouts

10/04/22 Photosynthesis Chapter 8.1-8.2 Video Review

10/06/22 Process of Photosynthesis Chapter 8.3 Handouts

10/11/22 Cellular Respiration Chapter 9.1-9.2 PowerPoint

10/13/22 Cellular Fermentation Chapter 9.3 Handouts

10/18/22 Cell Growth, Division Chapter 10.1-10.2 PowerPoint

10/20/22 Cell Regulation/Reproduction Chapter 10.3-10.4 Video Review

Date Topic Reading Assignment Reference material

10/25/22 Genetics/ Meiosis Chapter 11.1-11.4 Video Review

10/27/22 DNA, RNA Chapter 12.1-13.4 Video/PowerPoint

11/01/22 Genetic Engineering/Ethics Chapter 15.1-15.4 Video/PowerPoint

11/03/22 Darwin, Natural selection Chapter 16.1-16.4 Handouts/Video

11/08/22 Intelligent Design Project Handouts/Video

11/10/22 Construction of Chromosome Handouts PowerPoint/video

11/15/22 Classification, Phylum/species Handouts PowerPoint

11/17/22 Precambrian explosion Research, Handouts Video/PowerPoints

11/22/22 Thanksgiving Break Research Video Review

11/24/22 Thanksgiving

11/28/22 Viruses and Prokaryotes Chapter 20.1-20.3 Handouts

12/01/22 Viruses and Bacteria Chapter 20.3 Video/Handouts

12/06/22 Protists and Fungi Chapter 21.1-21.2 Handouts

12/08/22 Ecology of Protists Chapter 21.3-21.4 Handouts

12/13/22 Review for Exam Chapters 1-21 Oral quiz

12/15/22 Semester Exam Chapter 1-21