Ephrata High School
Course Syllabus

Foundations of Biology
4025

I. Course Description

The curriculum contains the core content determined by the Pennsylvania State Standards. Foundations of Biology is a Level 2 course. The material is presented from two different perspectives. The first perspective is on organisms from the cellular and molecular level. Molecular components of cells and their function will be addressed during this section. Heredity and the function of DNA will be included here. The second perspective will be the ecosystem and how organisms fit into the biosphere. Time will be spent on interaction of organisms at the population, community, and ecosystem level. Study of adaptations and evolution will tie the study of the two perspectives together.

The content meets core requirements and is enriched in certain areas of study. Some topics will be developed in greater detail and depth. This course is designed for students who possess strong math, science and English skills. Emphasis will be placed upon developing ***independent*** study skills as well as analytical thinking and deductive reasoning skills.

II. Materials & Equipment

Biological Science: An Ecological Approach, published by Kendall Hunt Publishing, is the textbook used for this course. The instructor provides all laboratory equipment.

III. Course Goals & Objectives

1. Acquire a body of knowledge regarding living organisms
2. Attempt to understand the organization of the biological world
3. Develop an appreciation of the diversity of life forms
4. Become acquainted with the uses of biological knowledge
5. Develop appreciation for molecular biology and genetic research and its role in future health.

IV. Course Topics (Summary Outline)

Biochemistry
- Carbon
- Carbohydrates
- Lipids
- Proteins and Enzymes
- Nucleic Acids

Microscopes

Cells, Cell Membrane and Transport
- Cell Theory
- Cell types
- Organelles
- Active and Passive Transport

Photosynthesis and Cellular Respiration
Cell Division
- Mitosis
- Meiosis

Development
DNA Structure and Function
- Transcription, Translation, and Replication

Genetics
- Mendelian Genetics
- Types of Inheritance
- Probability and Solving Genetic Problems
- Biotechnology
  - Cloning and stem cells

Ecology – Interdependence of Life
- Populations Ecology
- Communities
- Ecosystems structure and function
- Flow of Matter and Energy

Evolution
- Adaptation
- Natural Selection
- Mechanisms of Evolution
- Evidence

Classification
- 6 Kingdoms
- Biodiversity
- Taxonomy of Living Things
- Viruses/Bacteria

Animals
- Fetal Pig Dissection

V. Assignments & Grading

A combination of tests, quizzes, laboratory reports, classroom assignments, homework, projects, and participation will be used to evaluate students. Everyone is expected to be an active class participant. Projects will be assigned throughout the year; a minimum of one project per marking period will be assigned. Each project and its evaluation will be described in detail when the assignment is made. A **comprehensive** final exam will be given and counts for **one fifth of the total grade** in this course. This means the final exam will be averaged with the four marking period grades (each counting for 20% of the final grade).