



## National Taiwan University of Science and Technology

### 2021 Summer Program

### BIOL 101 Introduction to Biology with Lab

### Course Outline

**Course Code:** BIOL 101

**Instructor:** Todd A. Wells, Ph.D.

**Home Institution:** University of Denver

**Office Hours:** TBA & By Appointment

**Email:** todd.wells@du.edu

**Credit:** 4

**Course Description:** This course is an introduction to basic principles common to all facets of biology. Topics include a brief history of biology, the diversity of life, cell structure and reproduction, and metabolism.

**Lecture:** The format of class meetings will be a combination of traditional lecture format, problem solving/ group activities, group discussions, and laboratory exercises. I will summarize new material and present illustrations and examples. In lecture, I WILL NOT identify and describe every detail you will read in the text and any supplemental materials. I will, however, emphasize the important topics covered in the reading. You should stop me at any time if you have questions about the material being covered.

**Reading:** You are expected to complete the assigned reading prior to the class lecture. After lecture, you should reread the assigned text. I recommend that you understand the material and how to solve the sample problems before proceeding to the next section. At the end of each chapter, a summary of important equations and terms is provided that should prove helpful in the preparation for exams.

**Course Learning Outcomes:**

1. Identify the internal and external structures of both the prokaryotic and eukaryotic cells.
2. Recognize energy pathways such as photosynthesis, respiration, and overall cellular metabolism.
3. Knowledge of basics in genetics, molecular/cellular biology.



4. Understanding of principles of evolution and phylogeny.
5. Ability to connect biological knowledge to society issues
6. Appreciation of biological diversity.

**Required Textbooks:** We will also use an online textbook found at OpenStax Biology (open source e-book): <https://openstax.org/details/books/biology-2e>

**Homework:** Each lecture has a group of homework problems assigned to it. The problems are chosen to prepare you for the hour exams. If you understand and can do all the homework, you probably will do well on the exams. To get the most benefit from homework, you should **do the assignments on schedule**. It is important to keep up with these assignments!

**Exams:** There are two hour exams during the course, plus a cumulative final exam. Each exam counts 200 points. Exam problems will be similar to the problems assigned as homework and the problems worked in class.

**Grading & Evaluation:** Your final grade is based on a maximum of 650 points, distributed as follows:

<b>Hour exams (200 points each)</b>	<b>200 points</b>
<b>Final exam</b>	<b>200 points</b>
<b>Homework</b>	<b>100 points</b>
<b>Lab</b>	<b>150 points</b>

### Grade Ranges

A $\geq$ 94%	B- 80-83%	D+ 67-69%
A- 90-93%	C+ 77-79%	D 64-66%
B+ 87-89%	C 74-76%	D- 60-63%
B 84-86%	C- 70-73%	F $\leq$ 59

### Course Schedule:

#### Week 1 (videos 1-5)

1. Introduction, Biological Macromolecules, Chemistry of Life
2. Cellular Structure
3. Bioenergetics: respiration and metabolism
4. Bioenergetics: photosynthesis

Lab1 – Cellular Morphology

#### Week 2 (videos 6-10)

5. The Cell Cycle
  6. Meiosis and Sexual Reproduction
  7. Mendelian genetics and heredity
- Lab2 – Enzyme Catalyzed Reactions and Respiration

#### Week 3 (videos 11-15)

8. Mendelian genetics and heredity



9. DNA Structure and Function
10. Gene expression and control
11. Recombinant DNA

technology Lab3 – Genetics

**Week 4 (videos 16-20)**

12. Bioethics
13. Genetic Diseases
14. Biotechnology and Genomics
15. Evolution and the Diversity of Life
16. The History of Life

