



National Taiwan University of Science and Technology

2020 Summer Program

BIOL 101 Introduction to Biology with Lab

Course Outline

Term: July 06-August 07,2020

Class Hours: 8:00-9:50 (Monday through Friday)

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

Class Hours: According to the regulations of Minister of Education, R.O.C, 18 class hours could be counted as 1 academic credit in all universities in Taiwan. This course will have 72 class hours, including 40 lecture hours, professor 10 office hours, 10-hour TA discussion sessions, 2-hour review sessions, 10 laboratory hours.

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!

In-class Activities: In-class activities will allow you to apply your knowledge. These activities may be more challenging than the assigned homework. You will work in small groups to complete these activities. The in-class activities will be graded.

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 1000 points, distributed as follows:

Hour exams (200 points each)	400 points
Final exam	200 points
Homework	100 points
In-class Activities	100 points
Lab	200 points

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

1. Introduction, Biological Macromolecules, Chemistry of Life
2. Cellular Structure
3. Bioenergetics: respiration and metabolism
Lab1 – Cellular Morphology

Week 2

4. Bioenergetics: photosynthesis
5. The Cell Cycle
6. Meiosis and Sexual Reproduction
Lab2 – Enzyme Catalyzed Reactions and Respiration

Week 3

7. Mendelian genetics and heredity
8. DNA Structure and Function
9. Gene expression and control
Lab3 – Genetics

Week 4

10. Recombinant DNA technology
11. Bioethics
12. Genetic Diseases
Lab4 – Molecular Biological Methods

Week 5

13. Biotechnology and Genomics
14. Evolution and the Diversity of Life
15. The History of Life