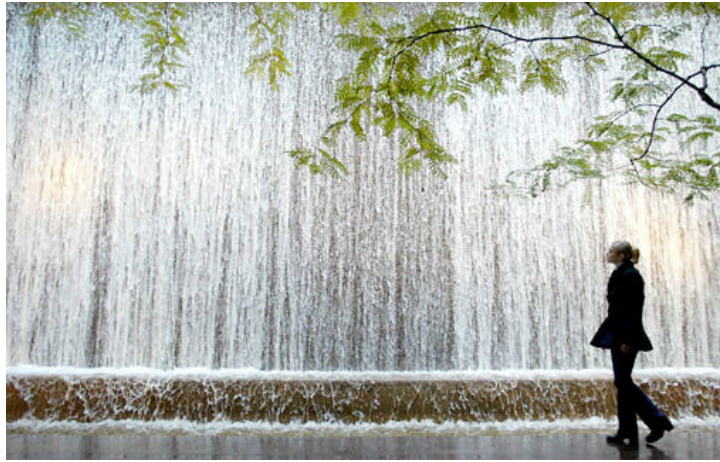


Tentative Syllabus: Biology 181- The Unity of Life I



***Text: Biology : LIFE: The Science of Biology (6th ed.) Purves et. al.
Instructor: Dr. L. Fritz (523-8265); Lawrence.Fritz@nau.edu***

- 1. Course Description:** An introductory course for Biology majors -emphasizing the unifying cellular and molecular principles of all life on earth. The course will progress from atoms and molecules, through cell structure, reproduction and metabolism and finally to molecular genetics.
- 2. Course Objective:** Serious, hard-working, students will leave the course with a firm understanding of the cellular and molecular principles of modern Biology and will be well-prepared to begin the Biology majors' program.
- 3. Laboratory:** Each student will sign up for one 3-hour laboratory module period (see the schedule of classes). Your lab Teaching Assistant will explain all laboratory assignments. The laboratory component of the class is worth 25% of the course scores.

THE LABORATORY COMPONENT IS IMPORTANT SO TAKE IT SERIOUSLY!

- 5. Examinations:** There will be 7 comprehensive in-class quizzes (each worth 20 pts.) and a comprehensive final (100 pts.). NO MAKEUP EXAMS WILL BE GIVEN.
- 6. Grading:** Your course grade will be based on the combined total points of the five best class quiz scores (100 pts.) and the final exam (100 pts) combined with the laboratory grade (50 pts).

You must take the final exam to receive a passing grade for the course.

Attendance: Regular class attendance is your responsibility. Exam questions will come primarily from the lecture material and therefore class attendance will be a requisite for a good grade. You alone are responsible for your class notes; they will NOT be given out. Laboratory attendance will be recorded.

Academic Integrity: The University will not tolerate acts of academic dishonesty, including plagiarism, cheating on exams, forging of signatures, copying from other students, etc. Appendix F of your Student Handbook describes NAU policy in this regard and this will be class policy. Confirmed acts of Academic Dishonesty in laboratory or in class will result in a final grade of zero.

Recitations/Learning Assistance: Bio181 class Supplementary Instructions will be offered and students are encouraged to attend and will earn 1 credit hour for signing up. The Learning Assistance Center (LAC) offers help in study skills, reading and tutoring. You are encouraged to use these services. LAC is in the Student Union, second floor. Phone 523-5524.

Disabled Students: Office of Disabled Student Services provides for physically handicapped and the learning disabled. Located in the Counseling Center next to Math building.

Insurance: NAU insurance may not provide medical coverage to students injured while participating in university programs, including lectures and labs. You should check your own medical insurance status and, if necessary, obtain medical/health insurance through a Health Insurance Plan or through the Fronske Health Center.

Tentative Lecture Topics: (Relevant Text Chapter)

I. *The diversity of Cells*

Overview

II. *Biology: The Study of Life* (Ch. 1)

A. Common Features of Living Things

B. Hierarchy of Life: The Kingdoms

C. Scientific Methods

Observation; Questioning; Hypothesis; Experimentation; Theory

III. *Atoms & Molecules* (Ch. 2)

A. Atomic Structure

B. Elements & Isotopes

C. Periodic Table

D. Chemical Bonds: ionic, covalent

IV. *The Atoms of Life* (Ch. 2)

A. P COHN

B. Properties of Water

C. The pH scale

V. *The Macromolecules of Life* (Ch. 3)

A. Carbon framework..

B. Carbohydrates

C. Lipids

D. Proteins

E. Nucleic Acids

VI. *Energy & Metabolism* (Ch. 6)

A. Oxidation/Reduction reactions

B. Potential/Kinetic Energy

C. First & Second Laws of Thermodynamics

D. Catalysts/Enzymes

E. Enzyme Inhibition/Activation

F. Coenzymes/Cofactors

G. ATP

VII. *Origins of Life* (Ch. 25)

A. Origins of Organic Molecules

B. Miller-Urey Experiment

C. Early life-Endosymbiosis Theory

VIII. *Biology of the Cell* (Ch. 4)

A. Cell Theory

B. Limits to cell size

C. Prokaryotic Cell Structure

D. Eukaryotic Cell Structure

E. Cell Organelles

1. Cytoplasm
 2. Endoplasmic Reticulum
 3. Golgi
 4. Mitochondria
 5. Chloroplasts
 6. Nucleus
 7. Cytoskeleton
- F. Cell Motility
- IX. *Cell Membranes* (Ch. 5)
1. Structure/Forces
 2. Diffusion/ Active transport
- X. *Cellular Energy A.* (Ch. 7)
- A. Oxidative Respiration
1. Glycolysis- Steps & ATP production
 2. Krebs Cycle- Steps & Energy products
 3. Electron Transport Chain- ATP production
- XI. *Cellular Energy B.* (Ch. 8)
- B. Photosynthesis
1. Electromagnetic radiation & Energy
 2. Chlorophylls- structure & absorption properties
 3. Light Reactions: Photosystems & electron transport chain,
ATP, NADPH production
 4. Dark reactions: Calvin cycle & products
- XII. *Cell Reproduction-Asexual* (Ch. 9)
- A. Chromosome structure & arrangement
 - B. Cell Cycle: G1,S,G2,M
 - C. Mitosis: Stages; Cytokinesis
- XIII. *Cell Reproduction-Sexual* (Ch. 9)
- A. Meiosis: Steps
 - B. Comparison with mitosis
 - C. Why sex?
- XIV. *Patterns of Inheritance* (Ch. 10)
- A. Mendelian genetics
- XV. *Molecular Genetics* (Ch. 11)
- A. DNA Structure
 - B. DNA Replication
 - C. Chromosomes and Genes
- XVI. *Gene Expression* (Ch. 12)
- A. Transcription
 - B. Translation
 - C. The Genetic Code

Important Dates to Remember:

January 23	Quiz 1
February 8	Quiz 2
February 27	Quiz 3
March 13	Quiz 4
April 3	Quiz 5
April 17	Quiz 6
May 1	Quiz 7
May 6	Final Exam(7:30am!!)

