

Fall 2008 Syllabus BIO 4500 Cell Biology (4 credits)

COURSE DESCRIPTION: Cell biology is the organization and function of cellular structures in animal, plant, and microbial systems. Emphasis on the molecular basis of metabolism, transport, mobility, nerve conduction, and the cell cycle.

COURSE GOALS AND OBJECTIVES: Cell biology is an important course for practically anyone who wants a career in biology, be it in medicine or research. At the end of this course you will have obtained a greater understanding (and appreciation) of cell biology. By the end of the course students will have learned:

- How organisms obtain energy
- The assembly, structure and function of proteins, DNA, RNA and membranes
- How proteins are sorted
- How cells communicate
- The structure and function of the cytoplasm
- How cells divide and how cell division is regulated
- The basics of the immune system
- Understanding common experimental tools used in cell biology

These goals support the Department of Biology Education Outcome #1, #3 and #4 and VSU General Education Outcome #5.

PREREQUISITES: Biol2230, Biol2270 and Chem3601

INSTRUCTOR: Dr. Theresa Grove
Office: BC 1099 Lab: BC 2072
Phone: 333-5336
Email: tjgrove@valdosta.edu

OFFICE HOURS: W: 8:30-10:30 a.m. and Th: 11:00 a.m. -12:00 p.m., by appointment or stop by my office

TEXT BOOK: Molecular Biology of the Cell by Alberts *et al.* (2008) 5th ed. (ISBN978-0-8153)

LECTURES: Tuesday and Thursday 8:00-9:15 a.m. (BC room 1024)

LAB: Wednesday 2:00 p.m. - 4:50 p.m. (BC room 2071)

ATTENDANCE POLICY: Attendance in lecture is expected by all students, but is not required. Attendance will be recorded so that patterns of attendance may be considered when determining borderline grades. Attendance in lab is required. I reserve the right to determine what constitutes an excused or an unexcused absence. Labs cannot be made up; therefore do not miss a lab. If you have an unexcused absence 10 points will be deducted from the total amount of points you have earned at the end of the semester. If you miss 2 labs you will not be able to earn higher than a C for your final grade.

CONDUCT: Arrive on time to lecture and lab. Turn off cell phones during class and lab; there is no reason you should be texting or calling anyone. Don't talk during lecture; if you don't

understand something or didn't hear something ask. Unless it's an emergency (and texting does not constitute an emergency) do not get up in the middle of lecture, leave and come back. Do not to ask to get up and leave the room during an exam, unless it is an emergency.

EXAMS: There will be 3 in-class exams (excluding the final). Types of questions that may be included in the exams are fill in the blank, essay, short answer, matching, multiple choice, and multiple-multiple choice. Do not miss any in class exams. **IF** I approve a missed exam, I reserve the right to change the format of the exam (i.e. make it an oral exam).

LAB: Lab exercises will be available on WebCT or will be handed out in class prior to the lab period. It is your responsibility to read them before coming to lab. Short quizzes will be given during the lab and will be based on the previous week's lab and the objectives of the current week's lab. The quizzes will be handed out immediately at the start of the lab and will be collected ~10 minutes later. If you arrive late you will have a shorter amount of time to finish the quiz, and if you arrive after the quiz is collected you will receive a zero (0) for that quiz. As mentioned previously, a student will not be able to make up a lab. Attendance will be recorded in lab.

HOMEWORK: Homework problem sets and questions will be handed out periodically throughout the semester. No late homework assignments will be accepted.

FINAL EXAM: The final exam will consist of 2 parts. The first part of the exam will be worth 100 points and will focus on the last section of lecture material that was not covered on a previous exam. The 2nd portion of the exam will be worth 100 points and will cover information that was on the previous 3 exams. The final is NOT optional and must be taken on the scheduled date of Wednesday, December 10 at 10:15 a.m. -12:15 p.m. **NO EXCEPTIONS!**

GRADE SCALE: For all students, grades will be based on all exams and assignments. The grading scale is:

A	90-100%
B	80-89
C	70-79
D	60-69
F	<60

ASSESSMENTS: Grades will be based on:

Exams (3 at 100 points each)	300 points
Lab Quizzes (~10 at ~10 points each)	100 points
Lab Report (5 pages)	50 points
Final Exam	200 points
Homework	50 points
Total:	700 points

ACCESS OFFICE FOR STUDENTS WITH DISABILITIES: If you are registered with the Access office and are eligible for special testing or some other learning process, please be sure to let me know. If you are a student with disabilities and have not registered with the Access office, please do so and notify me if you intend to use their services. The Access office is located in 1115 Nevins Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

TENTATIVE CLASS SCHEDULE

Below is a suggested list of readings from the book that will cover what is discussed in class. Hopefully we will stay on course and not get behind. These readings may clarify notes and will provide supplemental information if anything is confusing, or if you missed a lecture. A lot of material will be covered over the course of the semester and I cannot stress enough that every day you should go over your notes to learn the information presented in lecture.

- Aug 19 Introduction and Chapter 2: Cell Chemistry and Biosynthesis
- Aug 21 Chapter 2: cont'd
- Aug 26 Chapter 3: Proteins
- Aug 28 Chapter 10: Membrane Structure
- Sept 2 Chapter 11: Membrane Transport
- Sept 4 Chapter 12: Intracellular Compartments and Protein Sorting
- Sept 9 Chapter 12: cont'd
- Sept 11 Chapter 13: Intracellular Vesicular Traffic
- Sept 16 **Exam 1 will cover Chapters 2, 3, 10, 11, and 12**
- Sept 18 Chapter 13: cont'd
- Sept 23 Chapter 14: Energy Conversion—Mitochondria and Chloroplasts
- Sept 25 Chapter 14: cont'd
- Sept 30 Chapter 4: DNA, Chromosomes and Genomes
- Oct 2 Chapter 5: DNA Replication, Repair and Recombination
- Oct 7 Chapter 5: cont'd
- Oct 9 Chapter 6: How Cells Read the Genome
- Oct 14 FALL BREAK NO CLASS
- Oct 16 **Exam 2 will cover chapters 13, 14, 4 and 5**
- Oct 21 Chapter 6: cont'd
- Oct 23 Chapter 7: Control of Gene Expression
- Oct 28 Chapter 7: cont'd
- Oct 30 Chapter 15: Mechanisms of Cell Communication
- Nov 4 Chapter 15: cont'd
- Nov 6 Chapter 16: The Cytoskeleton
- Nov 11 Chapter 16: cont'd
- Nov 13 Chapter 19: Cell Junctions, Cell Adhesion and the Extracellular Matrix
- Nov 18 **Exam 3 will cover chapter 6, 7, 15 and 16**
- Nov 20 Chapter 17: The Cell Cycle
- Nov 25 Chapter 18: Apoptosis
- Nov 27 THANKSGIVING NO CLASS
- Dec 2 Chapter 20: Cancer
- Dec 4 Chapter 25: Adaptive Immune System

LAB RULES AND REGULATIONS: Use common sense when working in the lab, and if you have any questions, ask!

- Bring a notebook to lab to write down your data.
- Read the lab handouts ahead of time so that you have some idea of what will be going on in the lab.
- Be on time for lab. Instructions, clarifications and changes in protocols will be given at the beginning of lab, and I will not repeat myself just because you are late.
- No eating or drinking in the lab at any time. Some of the chemicals we will be using are toxic or mutagenic.
- Clean up after yourself. Remove all labels/tape from the glassware, rinse and place in the tub by the sink.
- If you break something or think you may have broken something, please tell me. Accidents happen. It's a bigger problem if you do not tell me because I won't be able to fix or replace whatever is non-functional. If you have any questions about using a piece of equipment, it's always better to ask.

TENTATIVE LAB SCHEDULE

August 20: Lab 1-- Introduction to the lab and lab report instructions

August 27: Lab 2-- Microscopy Review

September 3: Lab 3--Purification of LDH and Protein Assay

September 10: Lab 4--Protein gel of LDH and Membrane Permeability

September 17: Lab 5--Cell Fractionation

September 24: Lab 6-- Mitochondrial Isolation and Analysis

October 1: Lab 7-- Phagocytosis and Exocytosis

October 8: Lab 8--Staining of polytene chromosomes from *Drosophila*

October 15: No Lab

October 22: Lab 9--DNA isolation and Analysis

October 29: Lab 10--Chemotaxis and Movement of the slime mold *Physarum polycephalum*

November 5: Lab 11-- Actomyosin and Muscle contraction

November 12: Lab 12-- Regeneration of Cilia and Flagella and Examination of the Cytoskeleton

November 19: Lab 13--Mitosis and Meiosis

November 26: No Lab due to Thanksgiving Break

December 3: Lab 14--Morphology of Cancer Cells and Radial Immunodiffusion