

# BY 330-1C CELL BIOLOGY COURSE OUTLINE (Fall, 2007)

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## **Course Objectives**

This course will attempt to introduce the students to modern cell biology. Classical cell biology will be discussed in historical perspectives. Current techniques used in the study of cell biology will be discussed in the appropriate sections. Areas of emphasis in the lecture are indicated. It is estimated that the percent of time dedicated to a topic are as follows:

Introduction and Cell Metabolism — 50%  
Cell Organization (and integration of metabolism) — 40%  
Cell Growth and Division and Signaling — 10%

## **Course Content**

### GENERAL INTRODUCTION

### CELL METABOLISM

- Small molecules
- Macromolecules
- Proteins
  - Structure
  - Function
- Enzymes (function and kinetics)
- Bioenergetics
  - Thermodynamics
  - Glycolysis
  - Krebs Cycle
  - Electron Transport

### DNA

- Structure
- Replication
- Repair

## RNA

- General Types of RNA
- General Transcription
- General Transcription Prokaryote mRNA
- General Transcription Eukaryote
  - mRNA
  - hnRNA
  - snRNA
- Ribosome Structure
- Transcription of Large rRNA
- Transcription of 5S rRNA
- tRNA
- Protein Synthesis

## CELL ORGANIZATION

- Overview
- Plasma Membrane
  - Structure
  - Transport
    - Molecular
    - Endo-and exocytosis
- Cytoplasm
- Cytoskeleton
- Internal Membranes
- Endoplasmic reticulum
- Golgi
- Lysosomes
- Peroxisomes
- Mitochondria
- Nucleus
- Cell Junctions

## CELL GROWTH AND DIVISION

- Cell Cycle
- Cell Growth
- Control of Cell Division
- Growth Factors
- Cell Signaling
  - Primary and Secondary messengers
  - Ion, steroid, G-protein, enzyme-linked
- Cancer Biology
- Guest Lectures

## **Course Requirements**

Each student is expected to attend all lectures and complete all of the exams during the required time.

## **Evaluation**

Course grade will depend on the scores of the 4 exams. Exam questions are derived solely from class notes. There is no extra credit available.

Exam 1:	September 12	20%
Exam 2:	October 3	20%
Exam 3:	October 24	20%
Exam 4:	November 14	20%
Exam 5:	December 12	20%

Grades will be assessed based on 10– point scale.

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

Make–up Exam Policy – Make–up exams for the first four exams will be administered during the week of the final exam. Only individuals with written medical (Doctor) or legal excuses will be allowed to take the test. Individuals **must** contact my office **within 24 hours** of an exam (either before or after) to be considered for a make-up exam, otherwise the grade will be assigned as a 0.

## **Name of Textbook**

Molecular Biology of the Cell, by Alberts, et al., 4<sup>th</sup> Edition, 2002.  
**Highly recommended, not required.**