Cell Biology
Biol 461, 661 Chem 461, 661

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Text: Highly recommended:
Biol/Chem 461: Essential Cell Biology, 2nd Edition,
“Baby Alberts”

Alberts et al. 2002, Garland
“Big Alberts”

Final Exam: Thursday May 6, 10:15 am – 12:15 pm

Lecture: Tuesday and Thursday, 11:30 am – 1:00 pm, Irving I Rm. 208
The course will cover principles of structure and function of eucaryotic cells.
Molecular and cellular aspects of internal organization of cells and their
integration in a multicellular community including cytoskeleton, energetics,
vesicular traffic, signaling, cell division cycle, DNA replication and transcription,
protein translation, adhesion, cancer and cell death.

Lab: Thursday, 2:00 pm – 5:00 pm, Irving I Rm. 207. First Lab, January 22.
Laboratory will involve hands-on exercises, and discussion of problem sets and
assigned readings related to course material.

Grading: There will be three exams, including two midterm exams and one final exam.
The final exam will be cumulative. Exams will cover all class and lab material,
and assigned readings. Biol/Chem 461 will be graded out of 500 points; midterm
exams and problem sets (100 points each), final exam (200 points). Biol/Chem
661 will be graded out of 600 points; midterm exams and problem sets (100
points each), final exam (200 points), Research proposal (100 points).

Midterm Exams: February 19 and April 1
Unit 1 – Introduction, Cell Organization, Microscopy
  Introduction to the class (Jan 15, 2004)
  Cells and Organelles - Some Definitions
  Microscopy

Unit 2 - Informational Macromolecule
  Macromolecules – General
  Nucleotides and Nucleic Acids
  Amino acids and Proteins

Unit 3 - The Nucleus, Chromatin and Chromosomes
  The Nucleus - Structure
  Protein Targeting to the Nucleus.
  Chromatin and Chromosomes
  Nucleosomes and other aspects of the
  structure of chromatin.
  Higher level structure in chromatin

Unit 4 - Biological Information Flow
  The Genome and Transcription Units
  Transcription Process
  Transcript Processing
  Translation

Unit 5 – Membranes
  Membrane Lipids and Bilayers
  Membrane Proteins and Carbohydrates
  The Plasma Membrane
  Membrane Transporters, Channels and Action Potentials

Unit 6 – Mitochondria and chloroplasts
  Mitochondria and chloroplasts as degenerate bacterial symbionts
  Bacteria, Mitochondria, Chloroplasts and ATP Generation

Unit 7 – Endomembrane System Protein Processing
  Targeting to the Endomembrane System
  Vesicle Transport and the Golgi Apparatus
  Secretion, Lysosomal and Endocytotic Pathways

Unit 8 - Cytoskeleton
  Intermediate Filaments, Microtubules,
  Flagella, Microfilaments

Unit 9 – Cell Cycle
  Cell Cycle, CDK & Cyclin
  DNA Replication and Chromosomes
  Mitosis & Cell Division