

**Biology 580 Cellular Physiology  
Spring 2007  
Course Syllabus**

**Course Text:**        *Molecular Biology of the Cell* by Alberts et al.; 4th edition, Garland Science, 2002 (ISBN 0-8153-3218-1(hardbound) or 0-8153-4072-9(pbk)).

**Course Website:**    <http://webteach.csun.edu>

**Instructor:**        Rheem D. Medh, Ph. D.  
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(818) 677-3338

**Class Schedule:**    MW: 8:00 pm to 8:50 am, EH 2204

**Office Hours:**        **R:**     11:00 am- 1:00 pm  
                                  **F:**     11:00 am -1:00 pm  
                                  or by appointment

**COURSE OBJECTIVES:**

BIOL 580/L will emphasize on the principles of cell physiology, and highlight important physiological pathways operating at the cellular level. In close coordination with the laboratory component, the course will visit the modern research methods used to resolve outstanding questions concerning cell function. The goal of this course is to provide an understanding of cellular processes that are fundamental to the function of all organs and tissues.

Topics to be covered include:

- a. Introduction to cell structure, function, and intracellular organelles.
- b. Membrane structure, transport and role of membrane proteins.
- c. Protein sorting in intracellular compartments and intracellular vesicular transport.
- d. Cell signaling and communication; cytoskeleton and extracellular matrix.
- e. Latest developments in cell cycle regulation, stem cell research.

**COURSE REQUIREMENTS:**

This course is designed for students majoring in Biology. Prerequisites are: Biol 380/L and CHEM 334.

- a. Attend class regularly, participate in discussions and complete any assignments on time.
- b. Perform satisfactorily in the two Midterm exams and the final exam with a score of at least 50%.

**METHOD OF EVALUATION:**

- a. **Mid-term Exams:** There will be two mid-term exams, worth 100 points each. The format will be short answers/ essay questions.
- b. **Final Exam:** The comprehensive final exam will be worth 200 points. The format will be short answers/ essay questions.

There will also be periodic take-home assignments (practice questions for exams), which may be turned in a week from the date assigned. Although the assignments will not be graded, students are expected to complete them.

**There are no make-up exams or extra credits available.** Grades will be based on total points earned. There will be no curve.

A	≥ 95%	C+	74-70%
A-	94-90%	C	69-65%
B+	89-85%	C-	64-60%
B	84-80%	D	59-50%
B-	79-75%	F	< 50%

**BIOLOGY DEPARTMENT WITHDRAWAL POLICY:** Unrestricted withdrawals are permitted only until the end of the third week. Thereafter, requests to drop a class will be honored only when a *verifiable* serious and compelling reason exists and when there is no viable alternative to withdrawal. *Poor performance is NOT an acceptable reason for withdrawal.* During the last three weeks of the semester withdrawals will not be approved except when a student is withdrawing from ALL classes for verifiable medical reasons.

**CHEATING AND PLAGIARISM:** All forms of cheating and plagiarism (the claiming of the work of others as your own) are expressly forbidden by University rules and will not be tolerated. Any student observed cheating will be subject to disciplinary action by the University and may receive a grade of F in the course.

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**Course Text:** None. Notes for weekly laboratory exercises will be posted on the course website.

**Course Website:** <http://webteach.csun.edu>

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(818) 677-3338

**Graduate Assistant:** Ruchika Loya  
LO1305  
**Office Hours: F 11:30 am to 1:30 pm**  
[Ruchika.loya.68@csun.edu](mailto:Ruchika.loya.68@csun.edu)

**Class Schedule:** MW: 9:00 pm to 11:50 am, EH 2204

**Office Hours:** R: 11:00 am- 1:00 pm  
F: 11:00 am -1:00 pm  
or by appointment

**COURSE OBJECTIVES:**

BIOL 580/L will emphasize on the principles of cell physiology, and highlight important physiological pathways operating at the cellular level. In close coordination with the lecture component, the course will visit the modern research methods used to resolve outstanding questions concerning cell function. The goal of this course is to provide an understanding of cellular processes that are fundamental to the function of all organs and tissues.

Students will employ current cellular and molecular techniques to study the following:

- a. Introduction to cell culture, microscopy, visualization of intracellular organelles.
- b. Subcellular Fractionation, membrane permeability and transport.
- c. Intracellular localization of proteins, regulation of gene expression.
- d. Cell signaling and communication; cytoskeleton and extracellular matrix.
- e. Latest developments in cell cycle regulation, stem cell research.

**COURSE REQUIREMENTS:**

This course is designed for students majoring in Biology. Prerequisites are: Biol 380/L and CHEM 334. Concurrent enrollment in BIOL 580 is required.

- a. Attend laboratory regularly, complete all experiments and turn in laboratory reports on time.
- b. Present experimental results and interpretations in an organized format.
- c. A write-up about the laboratory exercise will be posted on the course web-site every Friday. Students are expected have read their assignment and should bring a print-out to class.

### **METHOD OF EVALUATION:**

- a. **Laboratory Reports:** Each student will maintain a laboratory notebook, which will be examined every Monday for the previous week's records. You will be instructed on the format of the notebook, and will be graded based on the quality and content of your notebook. Each week's report is worth 10 points.
- b. **Laboratory Presentations:** The laboratory exercises are divided into four major sections. At the end of each section, students will be required to present their data and provide an analysis of their results. Each group will do a separate presentation (approximately 15 min), but both members of the group will present together. Each student will be graded individually based on the presentation, ability to interpret data, and answer questions. Each presentation is worth 25 points.
- c. **Participation and Punctuality:** Students are expected to be on time, complete their bench work in a timely fashion, and participate in laboratory discussions. Students will be graded for their interest, presence, motivation and dedication to the laboratory. Total points: 60.

The laboratory portion of this course will be worth 300 points. A percentage will be calculated to assign a final grade..

**There are no make-up exams or extra credits available.** Grades will be based on total points earned. There will be no curve.

A	≥ 95%	C+	74-70%
A-	94-90%	C	69-65%
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B	84-80%	D	59-50%
B-	79-75%	F	< 50%

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**Spring 2007: BIOL 580/L**  
**Class Schedule**

	<b>Date</b>	<b>Reading</b>	<b>Lecture</b>	<b>Laboratory</b>
Jan	29	Notes	Introduction to cell structure and function	Introduction to Laboratory; Preparation of solutions
	31	Notes	Intracellular Organelles	Cell culture, trypsinization, counting
Feb	5	Chapter 10	Membrane Structure	Permeability and osmosis in RBCs
	7	Chapter 10	Membrane Proteins	Preparation of erythrocyte ghosts
	12	Chapter 11	Principles of Membrane Transport	Subcellular Fractionation-I
	14	Chapter 11	Ion channels & electrical properties of membranes	Subcellular Fractionation-II
	19	Chapter 11	Neuronal Action Potentials	Paper Discussion: Active Transport
	21	Chapter 12	Protein Sorting in Intracellular Compartments-I	Fluorescent Microscopy of cellular organelles
	26	Chapter 12	Protein Sorting in Intracellular Compartments-II	<b>Presentation of experimental results</b>
	28	Chapter 12	Protein Sorting in Intracellular Compartments-III	Bacterial transformation
March	5		<b>Midterm Exam I</b>	Plasmid Mini Preps
	7	Chapter 13	Intracellular Vesicular Traffic-I	Large Scale Plasmid Preparation
	12	Chapter 13	Intracellular Vesicular Traffic-II	Quantitation and gel analysis of plasmid DNA
	14	Chapter 13	Endo and Exocytosis	Electron Microscopy
	19	Chapter 15	Cell Communication	Transfection of Cells ( <i>Treat on Tues?</i> )
	21	Chapter 15	G-Protein coupled receptors	Process transfected cells, visualize GFP
	26	Chapter 15	Kinase Cascades	Luciferase Assays
	28	Chapter 15	Regulated Proteolysis	<b>Presentation of experimental results</b>
April	2, 4		<b>SPRING BREAK</b>	
	9	Chapter 16	Cytoskeleton-I	Discussion of experiment; Cell treatment ( <i>on Tues?</i> )
	11	Chapter 16	Cytoskeleton-II	Cell harvesting, lysis
	16		<b>Midterm Exam II</b>	Bradford Protein Assay
	18	Chapter 19	Extracellular Matrix-I	Prepare SDS-PAGE gel, Sample preparation
	23	Chapter 19	Extracellular Matrix-II	Run gel, transfer to membrane
	25	Chapter 17	Components of the Cell Cycle	Complete Western blotting
	30	Chapter 17	Cell Cycle Regulation	<b>Presentation of experimental results</b>
May	2	Chapter 17	Apoptosis	Cell Proliferation Assay
	7	Notes	Embryonic Development	DNA Laddering
	9	Notes	Stem Cells-I	Apoptosis Assays
	14	Notes	Stem Cells-II	<b>Presentation of experimental results</b>
	16		<b>Review Class</b>	<b>Check Out</b>
	23		<b>Final Exam (8:00 am to 10:00 am)</b>	