

Sonoma State University
Department of Biology
Biology 123: Molecular and Cell Biology
Fall 2008

Lecture Instructors:

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Wed. 2 -3 PM

Dr. Murali Pillai

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Laboratory Instructors:

Ms. Rana Kalmoni

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Mr. Blake Foster

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Mr. John Kozlowski

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Office hours: Tues. 5-6 PM

Lecture: All Sections: Tue. & Thurs. 1:00-2:15 PM, 102 Darwin Hall

Laboratory: Section 2: Tues. 9:25 AM - 12:15 PM, 205 Darwin Hall [Ms. Kalmoni]

Section 4: Tues. 2:25 PM - 5:15 PM, 205 Darwin Hall [Mr. Foster]

Section 6: Tues . 6:00 PM - 8:00 PM, 205 Darwin Hall [Mr. Kozlowski]

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Course Objective and Goal: This course is third in a three semester series designed as a foundation course for biology majors. An introduction to basic cellular and molecular biology, including its origins and relationships to other biological disciplines, will be the primary focus of this course. The chemical basis of life processes, macromolecular processes, cellular physiology and metabolism, and mechanisms of cell regulation and specialization will be examined through lectures, independent readings, and laboratory exercises. Laboratory exercises will emphasize basic molecular and biochemical techniques and problem-solving skills. Required of all biology majors.

Prerequisites: BIOL 121, 122 or instructor's approval; AND CHEM 115A, 115B. Concurrent enrollment in CHEM 335A recommended. Satisfies GE, category B2 or B3.

Required Textbook: Essential Cell Biology: An Introduction to the Molecular Biology of the Cell by: Alberts, Bray, Johnson, Lewis, Raff, Roberts, and Walter; 2nd Edition; Garland Publishing, 2004. Other readings may be given in the lecture and laboratory handouts. On the lecture schedule, the reading assignments in Alberts et al. are cross-referenced to chapters in the text you used for BIOL 121 and 122 (**Biology:** by: Neil Campbell (7th Edition), The Benjamin/Cummings Publishing Company, San Francisco (2005).

Tests and Assignments: There will be **four** multiple choice lecture tests for a total of 400 points. **Six** ten point pop quizzes will be given in lecture. **Five** of them, for a total of 50 points, will count toward your grade. If you take all six, the lowest quiz score will be dropped. **No make up tests or quizzes will be given and no test scores will be dropped!** There will be several assignments for the laboratory portion of the course, for a total of 150 points. See the box below for details.

| DATES AND EVENTS TO REMEMBER | | |
|---|-------------------------|----------------|
| Lecture: 450 pts | | |
| Five Pop Quizzes | (out of six given) | 50 pts |
| First Test | (Tuesday, September 23) | 100 pts |
| Second Test | (Thursday, October 16) | 100 pts |
| Third Test | (Tuesday, November 18) | 100 pts |
| Fourth Test | (Thursday, December 18) | 100 pts |
| Quiz and Test Total | | 450 pts |
| Laboratory: 150 pts | | |
| Laboratory Attendance, Participation & Weekly Assignments | | 60 pts |
| First Lab Practical Exam | (Tuesday, October 21) | 30 pts |
| Written Research Report | (Tuesday, November 25) | 20 pts |
| Oral Presentation | (Tuesday, December 2) | 10 pts |
| Second Lab Practical Exam | (Tuesday, December 9) | 30 pts |
| Total for Lab | | 150 pts |
| Course Total: 600 pts | | |

Grading: Your final course grade will be determined based on the total number of points earned on all tests, quizzes, lab exams and lab assignments. It is expected that letter grades will be assigned on the basis of total points in the class according to the following scale:

| | | | |
|-----------------|--|-----------|--|
| 90 % and above: | A (A ⁻ , A): | 80-89.9%: | B (B ⁻ , B, B ⁺) |
| 70-79.9%: | C (C ⁻ , C, C ⁺) | 60-69.9%: | D (D ⁻ , D, D ⁺) |
| Less than 60%: | F | | |

Attendance and "serious participation" in lecture and lab are strongly encouraged since history has shown a strong correlation with course grade. Absence from the lab will cost you 5 points per unexcused absence! Late arrivals and early departures for no documented reasons will be counted as absence. Poor attendance at lecture generally results in poor test scores. Arriving late disrupt the class, so does leaving early!! Late students will not be given extra time to complete tests.

Regarding Exams: Questions and concerns regarding your answers on exam must be submitted in writing within one week after receiving the graded exam. Upon your request, the entire exam may be regraded. Please check the answer key before requesting a regrade.

Learning Disabilities: If you have a learning disability documented with SSU Disability Student Services and have need for some type of accommodation(s) in order to participate fully in this class, please feel free to discuss your concerns in private with the instructors. *You are responsible for coordinating accommodation requests with DSS and your instructor.*

As a student at Sonoma State University, it is important that you know the policies and procedures that affect you. These policies and procedures, approved by the SSU Academic Senate, may be found on the following web sites.

Add/Drop Policy (second page on this link)

<http://www.sonoma.edu/catalog/06-08/73regulations.pdf>

Add/Drop Dates (University Calendar)

<http://www.sonoma.edu/ar/calendars/index.shtml>

Cheating and Plagiarism Policy

<http://www.sonoma.edu/uaffairs/policies/cheatingpolicy.htm>

Grade Appeal Policy

<http://www.sonoma.edu/uaffairs/policies/gradepolicy.htm>

Access to Programs for Students with Disabilities Policy

<http://www.sonoma.edu/uaffairs/policies/disabilitypolicy.htm>

Diversity Statement

<http://www.sonoma.edu/diversity/>

BIOL 123 Lecture Schedule – Fall 2008

| Week | Date | Topic | Chapters | | Instructor |
|------|--------------|---|----------------|----------|-------------------|
| | | | Alberts et al. | Campbell | |
| 1 | 8/26 | Course Introduction: Chemistry & Water | 1&2 | 1,2,3 | Christmann/Pillai |
| | 8/28 | Lipids and Carbohydrates | 2 | 4,5 | Christmann |
| 2 | 9/2 | Amino Acids and Nucleotides | 2 | 5 | Christmann |
| | 9/4 | Protein Shape and Structure | 4 | 5 | Christmann |
| 3 | 9/9 | How Proteins Work | 4 | 5 | Christmann |
| | 9/11 | Energy Use by Cells | 3 | 8 | Christmann |
| 4 | 9/16 | Biosynthesis and Carriers | 3 | 9 | Christmann |
| | 9/18 | Nucleic Acids and Chromosomes | 5 | 5,15 | Christmann |
| 5 | 9/23 | TEST-1 | | | Christmann |
| | 9/25 | DNA Replication | 6 | 16 | Christmann |
| 6 | 9/30 | Transcription and Translation | 7 | 17 | Christmann |
| | 10/2 | Gene Regulation | 8 | 17 | Christmann |
| 7 | 10/7 | Gene Regulation (cont.) | 8 | 19 | Christmann |
| | 10/9 | Genetic Variation | 9 | 18,21 | Christmann |
| 8 | 10/14 | DNA Technology | 10 | 20 | Christmann |
| | 10/16 | TEST-2 | | | Christmann |
| 9 | 10/21 | Cell Structure & Function | 1&15 | 6 | Pillai |
| | 10/23 | Membrane Structure | 11 | 7 | Pillai |
| 10 | 10/28 | Membrane Transport and Excitability | 12 | 8 | Pillai |
| | 10/30 | Obtaining Energy From Food | 13 | 9 | Pillai |
| 11 | 11/4 | Glycolysis and TCA Cycle | 13 | 9 | Pillai |
| | 11/6 | Ox-Phos. and Energy Generation | 14 | 9 | Pillai |
| 12 | 11/11 | Veteran's Day Holiday: No Class | | | |
| | 11/13 | Chloroplasts and Photosynthesis | 14 | 10 | Pillai |
| 13 | 11/18 | TEST-3 | | | Pillai |
| | 11/20 | Intracellular Compartments | 1&15 | 7 | Pillai |
| 14 | 11/25 | Intracellular Transport | 15 | 7,17 | Pillai |
| | 11/27 | Thanksgiving Holiday: No Class | | | |
| 15 | 12/2 | Cell Signaling: General Principles | 16 | 11,45 | Pillai |
| | 12/4 | Cellular Signal Transduction | 16 | 11,45 | Pillai |
| 16 | 12/9 | Cellular Reproduction: Strategies | 18 | 12 | Pillai |
| | 12/11 | Control of Cell Division Cycle & Mechanisms of Immune Recognition | 19 | 12,43 | Pillai |
| 17 | 12/18 | TEST- 4 (2:00-3:50 PM) | | | Pillai |

BIOL 123 Laboratory Schedule - Fall 2008

| Week | Date | Exercise |
|------|--------------|--|
| 1 | 8/26 | Introduction, Lab Orientation and Chemistry Review: Volume and Concentration |
| 2 | 9/2 | Molecular Modeling of Carbohydrates and Lipids |
| 3 | 9/9 | Molecular Modeling of Proteins & Nucleotides: Computer Lab |
| 4 | 9/16 | Aqueous Solutions: pH, Micropipeting, Serial Dilutions, and Sterile Techniques |
| 5 | 9/23 | Let's Get Brown: Catechol Oxidase Enzyme Activity |
| 6 | 9/30 | Plasmid Isolation & Bacterial Transformation |
| 7 | 10/7 | Restriction Digestion and Polymerase Chain Reaction |
| 8 | 10/14 | Agarose Gel Electrophoresis of DNA |
| 9 | 10/21 | LAB EXAM 1 (Lab Notebook Due) Intro to Bioinformatics Exercise |
| 10 | 10/28 | Microscopic Techniques: Principles and Applications |
| 11 | 11/4 | Membrane Permeability; Extraction of Erythrocyte Membrane Proteins |
| 12 | 11/11 | Veteran's Day Holiday: No lab |
| 13 | 11/18 | Protein Electrophoresis: Casting Gels and Preparation of Membrane Proteins for SDS-PAGE Analysis |
| 14 | 11/25 | Electrophoretic Separation and Analysis of Membrane Proteins (Written Research Report Due) |
| 15 | 12/2 | Oral Presentations |
| 16 | 12/9 | LAB EXAM 2 (Lab Notebook Due) |