

## El Camino College

**Mission Statement:** The mission of El Camino College is to meet the educational needs of its diverse community and ensure student success by offering quality, comprehensive educational opportunities.

### FALL 2009 Course Syllabus Biology 103, Section 1118

**Course:** Biology 103  
**Title:** Fundamentals of Molecular Biology  
**Units:** 3 units  
**Transfer Credit:** CSU, UC

**Instructor:** Dr. Teresa P. Palos  
**Class Location:** Chemistry 103  
**Class Day/Time:** Lecture – M and W: 12:30 to 1:55pm

**Section:** 1118  
**E-mail Address:** [tpalos@elcamino.edu](mailto:tpalos@elcamino.edu)  
**Office Location:** Natural Sciences (NATS) 114  
**Telephone:** (310) 660-3593 Ext. 5354  
**Office Hours:** M, W, and Th: 3:00 – 4:00pm

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#### CATALOG DESCRIPTION:

*Prerequisite: Biology 101 and 102 with a minimum grade of C in each course; Chemistry 7A with a minimum grade of C or concurrent enrollment. The course is credit and degree applicable.*

Lecture: 3 hours.

This course is an introduction to molecular biology. The student will study DNA, RNA, and protein structure; protein biochemistry; protein purification and analysis; genome organization of viruses, prokaryotes, and eukaryotes; DNA replication; transcription and splicing; regulation of transcription; translation; and recombinant DNA technology. The student will also explore the uses of DNA technology, such as forensics and agriculture, as well as the ethical consideration of these uses.

#### STUDENT OBJECTIVES:

Goal: To gain a basic understanding of molecular biological concepts.

Student Objectives: The student will be able to:

- A. Explain and apply the Scientific Method.
- B. Describe the chemical structure and function of proteins and nucleic acids.
- C. Summarize DNA replication and processes underlying gene expression (transcription, translation, and their regulation).
- D. Compare and contrast the genomic organization of eukaryotes, prokaryotes, and viruses. This includes explaining the processes of transformation, conjugation, and transduction in prokaryotes.
- E. Describe techniques used in protein and nucleic acid studies. Included in the discussion are recombinant DNA methodologies.
- F. Articulate how recombinant DNA methodologies are used and present the pros and cons of their use.

#### POLICIES:

**Attendance:** You are **expected** to attend every meeting of the class. Points will not be given for attendance. **I WILL DROP YOU FROM THE COURSE AFTER THE 4<sup>th</sup> ABSENCE.** If you choose to drop the course, it is **your** responsibility to drop the course OFFICIALLY. If you do not take the exams or complete the required assignments because you have not attended class and you are on my final roster at the end of the semester, I will assign a Fail as your grade. Please refer to p. 11 of the 2009/2010 El Camino College Catalog for additional details on attendance requirements.

**Students with Disabilities:** Appropriate accommodations for testing and evaluation can be arranged for students that provide documentation of a learning disability. The Special Resource Center is located in the Student Services Center and their telephone numbers are (310) 660-3445 (TTD) and (310) 660-3296 (Voice) for assistance/information. Please let me know ASAP whether such accommodations are necessary. Additional information is available to you in the 2009/2010 El Camino College Catalog beginning on p. 20.

**Student Conduct:** Please be considerate to others in the class. Rude behavior will not be tolerated. Do not talk or read newspapers during lecture. Pagers, cell phones, radios, and beeping watches must be turned off before entering class. Do not eat, drink, or smoke during lecture. Please clean up after yourself before leaving the classroom.

As for participation in class, I expect it! I will not assign points for participation but I will take participation into consideration at the assignment of the final course grade if you are borderline between two grades.

**CHEATING** is unethical and most certainly not allowed. If you are caught cheating on an exam, quiz or any other assignment, you will be assigned a grade of a Fail equivalent to zero points. In addition to this penalty, you will be given assigned seating for subsequent exams and you will also bear the consequences of being reported to the appropriate college authority. Plagiarism is a form of cheating. If any part of a written assignment is plagiarized, you will not receive credit for the assignment. Standards of Student Conduct (Board Policy 5138) are available to you in the 2009/2010 El Camino College Catalog beginning on p. 25.

## **COURSE REQUIREMENTS:**

### **TEXTBOOKS:**

*Cell and Molecular Biology: Concepts and Experiments*, 5<sup>th</sup> edition, 2008 by Gerald Karp. Publisher: Wiley and Sons.  
ISBN: 978-0-470-04217-5.

**OPTIONAL** (but highly and enthusiastically recommended):

A dictionary! An excellent one is *The American Heritage College Dictionary*.

**Evaluation Criteria:** There will be 4 examinations. The format will include a combination of the following: multiple-choice, true/false, matching, short answer and essay. MAKEUP examinations are NOT allowed. You MUST take the exams as scheduled. If you miss an exam, you will receive zero points for that exam. Extra credit points are not an option. They will not be given. Scantrons (#882-E) and number 2 pencils are needed for the multiple choice component of the exams. You will have 4 quizzes throughout the semester. You will also prepare 3 written assignments on varied topics within the molecular biological realm. The details of the assignments will be specified in class.

**Grading Procedures: Be aware that I do not give grades. You earn the grades.**

Exam 1: 100 pts  
Exam 2: 125 pts  
Exam 3: 125 pts  
Exam 4: 150 pts  
Quizzes (4): 85 pts  
Written Assignments (3): 75 pts

**Total: 660 points**

A- 90 to 100% → 594 to 660 pts  
B- 80 to 89.9% → 528 to 593 pts  
C- 70 to 79.9% → 462 to 527 pts  
D- 60 to 69.9% → 396 to 461 pts  
F- Below 60% → 395 pts and below

## **HOW TO STUDY FOR THIS CLASS:**

- You will succeed in this class if you study consistently. **One to two hours of studying per week will NOT be sufficient. For every hour of lecture, you will need to invest two to three hours of study time outside of class.** For a 3 hour class per week, this is **6 to 9 hours**. **DO NOT** underestimate the amount of time you need to dedicate to this class.

- You **MUST** read. **Reading** is an integral component of the learning process. Reading before class is highly advisable. To **read** is to **examine and grasp the meaning of written or printed material**.
- **Memorizing a concept is not the same as understanding a concept.**
  - To **memorize** is to **commit to memory; learn by ‘heart’**.
  - To **understand** is to **grasp or comprehend the meaning intended; to comprehend the nature and significance of an idea/concept**.

(Source: *The American Heritage College Dictionary*)

**Do not confuse the difference between the two.**
- **Reading, understanding, and memorizing** work together to help you learn the material.
- **Your focus?** The material presented in class is your focus for the exams. The reading will cover the same material and it will provide a broader context. As a consequence, you will learn more than what you are tested on!
- Note-taking: Utilize an outline to help with your note-taking. I may provide you with a broad outline of topics for each lecture (written or verbal) but **you** will take your notes. I will not do your work for you.
- **REVIEW** your notes soon after the lecture has occurred. **DO NOT WAIT** till the weekend!!
- **REWRITE** your notes. This is a great way to go over the material!! As you rewrite, supplement with material from the text.
- Apart from the required reading, I suggest study aids like flash cards. Make drawings and diagrams to help you learn. Don't put too much information on the flashcard. Use one word or concept on the front and one definition or one to two sentences, respectively, on the back.
- Utilize the publisher resources that are available with the textbook, i.e. CD-ROM, website, etc.
- Attend office hours. Be prepared for office hours. As you ask for clarification, I will also ask you questions regarding the material. Why will I ask questions? To help you gain an understanding of the material.
- Students that have earned **A** grades in my classes have employed a number of study techniques. They have offered words of advice and they include but are not limited to the following:
  - “Make sure to understand the material during lecture. Ask questions.”
  - “Attend class and pay close attention...”
  - A number of students used the class handouts as the “backbone of chapter” covered and they used the “text to supplement material that is unclear in the handouts”.
  - Another student would “take extensive notes during class”.
  - “Read chapters and transfer additional info. onto printout (from computer download or handout distributed in class where appropriate)”
  - “...try to understand concepts rather than memorize everything individually.”
  - “**Don't** assume the questions asked will only require recognition for the answer.”
  - “Study as if you are studying for an essay exam, not a multiple choice exam.”
  - “Review terms and definitions”
  - “If material is understood, keep reviewing!”
  - “Focus the studies on what is covered in lecture as this is mainly a lecture-based course ..... Take **ACTIVE** notes on the slides passed out in class during lecture - anything not written down on the slides but is verbally stated by the professor should be noted. After class, read over the lecture slides and whatever notes taken during class, and refer to the textbook in order to clarify confusing/unclear concepts.” I will add, if the textbook is not clear, **SEE ME!**

The statements above were indeed made by a number of former students and I thank them for their input. Take their advice!

### Lecture Outline:

I may also delete or include additional material (i.e. handouts; pp. in other chapters). The pages for deletion or inclusion will be specified in class.

DATE	TOPIC	ASSIGNMENT
Aug 31	Course Introduction/Scientific Method	
Sep 2	Review of Eukaryotic and Prokaryotic Cellular Structure	Chapters 1; Parts of Chapters 4, 8, and 9
Sep 7	<b>HOLIDAY – Labor Day</b>	
Sep 9	Review of Eukaryotic and Prokaryotic Cellular Structure (cont'd)	Chapters 1; Parts of Chapters 4, 8, and 9

Additional Review Material: Carbohydrates and Lipids. This material will not be covered in class but will be covered in a handout and readings.

Sep 14	Proteins	Chapter 2
Sep 16	Enzymes	Chapter 3
Sep 21 and 23	Techniques of Protein Study	Chapter 18
Sep 28	Techniques of Protein Study (cont'd)	Chapter 18
Sep 30	<b>EXAM 1 (Scientific Method through Techniques of Protein Study)</b>	
Oct 5	Nucleic Acids	Chapters 2; Part of Chapter 11
Oct 7	The Gene and the Genome	Chapter 10
Oct 12 and 14	DNA Replication	Chapter 13
Oct 19	DNA Repair	Chapter 13
Oct 21	Transcription: RNA Synthesis	Chapter 11
Oct 26	<b>EXAM 2 (Nucleic Acids through DNA Repair)</b>	
Oct 28	Transcription: RNA Synthesis (cont'd)	Chapter 11
Nov 2 and 4	RNA Processing	Chapter 11
Nov 9 and 11	Translation: Protein Synthesis	Chapter 11
Nov 16	Regulation of Gene Activity in Prokaryotic Cells	Chapter 12
Nov 18	<b>EXAM 3 (Transcription through Regulation of Gene Activity in Prokaryotic Cells)</b>	
Nov 23 and 25	Regulation of Gene Activity in Eukaryotic Cells	Chapter 12
Nov 30 and Dec 2	Techniques of Nucleic Acid Study, Recombinant DNA, and Gene Cloning	Chapter 18
Dec 7	Techniques of Nucleic Acid Study, Recombinant DNA, and Gene Cloning (cont'd)	Chapter 18
Dec 9	Genetic Engineering: Applications and Problems	Handout/Discussion
Dec 14	Genetic Engineering: Applications and Problems (cont'd)	
Dec 16	<b>EXAM 4 – (Regulation of Gene Activity in Eukaryotic Cells through Genetic Engineering)</b>	



**NOTE: Be aware that the syllabus is subject to change.**

**NOTES:**

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# BIOLOGY 103 – Fundamentals of Molecular Biology

Acknowledgment that YOU have received, read, and understood the syllabus.

**NAME (PRINT):**

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**ID:**

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**SIGNATURE:**

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**E-mail address where I can reach you:**

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**OPTIONAL: Tell me a little about yourself.**

**What other science classes are you currently taking?** \_\_\_\_\_

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**What do you enjoy reading?** \_\_\_\_\_

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**What is your career goal?** \_\_\_\_\_

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