

COLLEGE OF SAN MATEO

Course Outline

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**Department** BIOL      **Number** 123      **Date** 8/25/03

**Course Title** Biotechnology Workshop: Techniques and Applications of the Polymerase Chain

Reaction      **Units** 1

**Hours/TERM** ~~Lecture: 16~~      **Scheduled Lab**      **By Arrangement**

**Length of Course**

- Semester-long  
 Short course (No. of weeks 5)  
 Open entry/Open exit

**Grading:**

- Letter  
 Credit/No Credit  
 Grade Option (letter or Credit/No Credit)
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1. **Prerequisite**(Attach Enrollment Limitation Validation Form.)

None

2. **Corequisite** (Attach Enrollment Limitation Validation Form.)

None

3. **Recommended Preparation** (Attach Enrollment Validation Form.)

BIOL 110 or high school biology or equivalent

4. **Catalogue Description** (Include prerequisites/corequisites/recommended preparation.)

Workshop in principles, applications, and hands-on techniques in PCR (polymerase chain reaction). Total of sixteen hours for five weeks. Recommended preparation: BIOL 110 or high school biology or equivalent.. \$2 Materials fee. (CSU/UC).

5. **Class Schedule Description** (Include prerequisites/corequisites/recommended preparation.)

Workshop in principles, applications, and hands-on techniques in PCR (polymerase chain reaction). Recommended preparation: BIOL 110 or high school biology or equivalent..

6. **Course Objectives** (Identify 5-8 expected learner outcomes using active verbs.)

Lecture topics include: DNA structure, natural and synthetic DNA replication, components and steps in the PCR reaction, genetics of PCR results. After taking this class students will be able to:

- 1) Perform PCR
- 2) Identify components, illustrate with diagrams, and analyze results of polymerase chain reaction (PCR).
- 3) Explain how PCR works, and recognize some of its applications.

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Students who master proper use of micropipets and follow stepwise procedures will get PCR products on gels. results are photographed, and students label gel bands, summarize and interpret results.

Completion of a two-part notebook is required.

Part A-complete lecture notes (okay to rewrite), including diagrams

Part B- lab notebook: for each exercise (often several in a day): state purpose, list materials, step-by-step procedures, results, notes/comments. do not rewrite; this is a record of everything you do, and should not be changed, corrected, edited, etc. okay to write comments, explanations, write something again more neatly for reference, but do not replace original.

Last class evaluate three other students' notebooks: Read them over and rate their success in the following: a-Lecture notes appear complete; b-Lecture notes are neat, readable; c-Lecture notes are organized; d-Write a sentence describing attributes of each notebook that you would incorporate into your own in the future.

9. **Representative Methods of Evaluation** (Describe measurement of student progress toward course objectives. Courses with required writing component and/or problem-solving emphasis must reflect critical thinking component. If skills class, then applied skills.)

Evaluation of lecture and laboratory parts of notebook by three other students will measure achievement of course objectives in understanding, recording and communicating the method of PCR in words and diagrams. Participation: Students are required to attend all five meetings of the class. Weekly work on pipet techniques, DNA preparation, gel electrophoresis are observed and supervised by instructor, and student success is measured by lab results, photographs of gel bands and comparison to class work in general, proper labelling of photos, interpretation, and conclusions, all recorded in lab notebook.

10. **Representative Text Materials** (With few exceptions, texts need to be current. Include publication dates.)

Background information and laboratory techniques provided by Applied Biosystems (which also supplies lab materials) are the main reference for the class.

Text: Spencer, C.A. GENETIC TESTIMONY: A GUIDE TO FORENSIC DNA PROFILING. Pearson Prentice Hall, 2004

Optional supplementary text materials: Palladino, M., UNDERSTANDING THE HUMAN GENOME PROJECT, Benjamin Cummings, 2002

Prepared by:

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Submission Date:

10/13/03