BIO 343 – PCR Mini-lab
Fall, 2008 Syllabus

Instructor: Dr. André Walther
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Office hours: Monday and Wednesday 10-11AM

Class time & place: Thursday 1-4 PM (first half of the semester)

Required Text: Quad rule Notebook from the bookstore

Prerequisites: BIO 231; junior or senior status

Course Description:

This lab intensive course will explore the technique of Polymerase Chain Reaction (PCR). Students will learn about PCR through a combination of theoretical discussions and hands-on experiments. Other powerful applications of the PCR thermocycler will also be discussed and carried out in the lab.

Objectives

The objectives for students in this course are to:

- Achieve a detailed understanding of the theoretical principles involved in PCR.
- Develop expertise in multiple PCR techniques.
- Improve critical and scientific thinking and presentation.

Course Outcomes

Upon successful completion of the course, students will:

- Demonstrate the ability to engage in scientific reasoning by interpreting and applying the concepts cell structure and function
- Demonstrate the ability to communicate these concepts orally and in writing

Assessment

The outcomes described above will be assessed through:

- Written exams and quizzes: scientific / quantitative reasoning, written communication ability
- Notebook: organization and written communication ability
- Class participation: oral communication ability

Student Responsibilities

Safety:

Students are responsible for ensuring the safety on themselves and others in the lab. The instructor will make sure to prepare the students for any potentially hazardous experiments. If you have a question about safety, please ask!

Readings:

While there is no associated textbook with course, students will be responsible for reading the instructor-provided handouts prior to coming to class. A failure to do so will result in a loss of class participation points.

Attendance:

Attendance at all labs is mandatory. If you must miss a lab because of a reasonable conflict or illness, please notify me as soon as possible. If you miss a lab, it may be possible for you to make up some of the work.

It may be necessary for you to come in on days other than the scheduled lab time in order to complete an experiment or remove tubes from the Thermalcycler.

Scholarship and Integrity:

I fully support the Cedar Crest College Honor Code and the Classroom Protocol code as stated in the Customs Book. You are required to abide by the Honor Code and by accepted practices of scholarship and integrity. All writing and other material that you submit must be your own, original work, unless otherwise acknowledged. Material that is quoted from another source must be clearly indicated as a quotation and must be followed immediately by a citation to the original source. Paraphrasing is not acceptable as original work; editing someone else's writing does not make it your own work. Cheating or plagiarism will result in a grade of F for the assignment or the entire course, at the instructor's discretion. If you have any questions about these issues, please discuss them with an instructor.

Classroom protocol:

The Honor Code states, "Appropriate classroom behavior is implicit in the Cedar Crest Honor Code. Such behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations and any other behaviors that might disrupt instruction and/or compromise students' access to their Cedar Crest College education."

Students with Disabilities:

Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

Assignments and Evaluation

Notebook (200 pts):

Each Experimental section will be assigned 50 pts. During the course of the lab you will be expected to keep a notebook of your observations and experiments. From reading your notebook, I should be able to understand what you did and why, as well as the outcome of the exercise.

Your notebook record of each lab exercise will include:
Lab Title and Date
Purpose of lab – Why are you doing this lab? What do you expect?
Lab Protocol – This includes the details of the experimental set up and what was done, including all reaction components (concentrations and volumes) and program parameters.
Lab Results -This includes observations and recorded data.
Lab Discussion – Briefly summarize the purpose of the lab, the expectations, and the results. Did the lab go as expected? If not, what may have gone wrong and what would you change?
Any Homework assignments distributed in class

Final Exam (200 pts):

The comprehensive take-home final exam will include course material from throughout the course.

Participation (+/- 5%):

Class participation and adherence to the classroom protocol may raise or lower your course grade by up to 5%. The participation grade will be determined solely at the discretion of the instructor.

Labs

I. Generation of point mutations in Green Fluorescent Protein
II. Short Tandem Repeat Genotyping of class
III. Genotypic analysis of a genetic disease by HRM Real-time PCR
IV. Gene expression analysis of HO gene by qRT-PCR

Schedule TBA