Biol 400M*01 – Advanced Molecular Genetics, Summer 2006
Mon, Tues, Thurs 9am-12 noon, Malouf 202

Dr. Brian Avery
Malouf 223
Office Hours Mon, Tues, Thurs 1pm-3pm, or by appt.
832-2352
bavery@westminstercollege.edu

Text and Required Materials
There is no required text book for the class, but required readings will be distributed at various times during the course. A carbon copy lab notebook is required, feel free to use the rest of an old one or new ones are available in our bookstore.

Course Descriptions and Objectives
This course will focus on the theory and methodology of modern molecular genetics. Short lectures will complement a combination of lab exercises and student driven research projects. Topics will include DNA sequencing, SNP analysis, AFLP genotyping, gene expression profiling, cDNA and genomic DNA library construction, genomics, and bioinformatics. The course is designed to help you move beyond a basic understanding of these techniques by analyzing and designing experiments using them and performing many of them. This course focuses on critical and analytical thinking as well as collaboration and teamwork during lab exercises and writing and other communication skills though the laboratory notebook, writing assignments, and presentations.

Assignments

Reading
The reading assignments should be considered as assignments. Please read the assignments before the assigned date to improve your comprehension of the course material. This is particularly important with the primary literature reading assignments since to have a productive discussion, everyone needs to have read the paper ahead of time. There may be a brief writing assignment before or after the discussion of the day’s paper or papers.

Laboratory Notebook
Your notebook is 30% of your grade and is taken very seriously in the class. The lab notebook is critical to conducting productive research. Your carbon copies will be collected weekly. More information and examples of notebooks are coming.

Laboratory Exercises
The first half of the lab will consist of performing the techniques that we will be discussing so that we can become more skilled with the basic procedures, while the later half of lab will be taken up by your own research projects (see below).
Research Projects
In the second half of the semester you will be required to design and perform a short research project. It will be your opportunity to further pursue a topic that interests you. More information on the project will be distributed and discussed.

Papers
There will be various technique and research papers that will be assigned throughout the semester. Guidelines for these will be given with the assignments.

Grading
The grading of the assignments in this course is designed to measure your efforts and your abilities. There will be no extra credit, so please take each opportunity to better your grade seriously. If you choose not to participate in the course at the level indicated required for a grade of “A,” that’s OK, just don’t expect an A. You are choosing your own grade by your level of effort. One helpful hint to budgeting your time is that each hour of class time will generate at least 2 hours of work outside of class.

Please do not ask me for your current grade, you can estimate it based on the grades that you have earned on returned assignments.

Grading Scale
A  94-100  C+  77-79
A-  90-93  C  74-76
B+  87-89  C-  70-73
B  84-86  D+  67-69
B-  80-83  D  64-66

Weight of Assignments
In-Class and presentations  10%
Laboratory Notebook  30%
Papers and Projects  60%

Accommodations:
Westminster College seeks to provide equal access to the college’s programs, services, and activities to people with disabilities as defined by the ADA and Section 504 of the Rehabilitation Act of 1973. If you have a disability for which you will need accommodations in this class, please let me know as soon as possible. You will also be required to provide documentation of your disability to the Services for the Students with Disabilities program in the START Center in Carleson Hall at 832-2280.
**Topics for class**

PCR
Theory
Application – RT PCR, qPCR, RAPD, AFLP
Uses – research, forensics, genetic testing, population genetics

Sequencing
Theory
Application – SNPS, genome sequencing
Uses – research, genetic testing, population genetics
Genomics – research, medicine, meta-genomics

DNA cloning
Theory
Methods – enzymes, vectors
Too many uses to list...

DNA Library construction
Theory
Application – genomic DNA, cDNA, vectors
Uses – whole genome sequencing, cloning

Bioinformatics
Theory
Methods - sequence comparison, pattern recognition

*This syllabus is subject to change.*