Course Syllabus - Molecular Genetics 4580 – Summer 2012

Professor: John F. Elder, 2088 Bio/Chem Building, Phone 333-5762,
Email: *jfelder@valdosta.edu*
Lecture: 8:00 am - 9:30 am Mon,Tues,Wed, Thur. Room 2022 Bailey Sci. Center
Lab: 10:00 am -12:50 pm Tues. & Thurs., Wed   Room 1085 Bailey Sci. Center.

Office Hours: 9:3.00 am - 11:00 am Monday, Wednesday or by appointment. I also have an open door policy, I encourage students to drop by whenever they may need help with the course. Please understand however, that under these circumstances, you may have to wait until I am free of other things.

Text: Genetics: None- we will work from assigned primary literature and notes..

Course Objectives: First and foremost, this is **not a course for the faint of heart**. I teach this course at a level appropriate for entry level graduate students. To do well students must participate in ALL course activities and be willing to invest a great deal of work both in and out of assigned class periods. The course requires large amounts of reading and thinking time, consistent participation in course discussions of research literature and a great deal of time for researching and writing out of class exams. Labs require that every student be actively participating in every lab and that they be familiar with all aspects of assigned lab topics. All lab information is fair game for tests.

Students are expected to demonstrate that they have learned a body of factual information and gained an understanding of the structure and function of genes on the molecular level, processes of molecular gene analysis and manipulation and some degree of ability with reading primary research literature related to molecular genetics. Gaining an ability to logically understand and synthesize answers to molecular genetic problems is necessary and integral to this course. This is not simply a memorization course. You must be able to use the information learned to formulate essay responses to problems posed. A reasonable amount of reading and study and time should be allocated to this course. A few hours study before exams will not be sufficient to score well in this course. Achievement of the above objectives will be evaluated based upon the student's satisfactory participation in class, completion of exams and laboratory reports. Course material and text readings will be assigned as we progress.

Grading policy: Letter grades will be based upon a 10 point scale and will include both lab and lecture. The laboratory portion of this class will constitute 20% of the overall grade while the lecture portion will compose the other 80 % of the overall grade. There are 2 tests and a comprehensive final exam. Exams will be take home, open book format. Do not take these exams lightly. They require a great deal of informational content, ability to read research literature and serious thought to synthesize acceptable answers. In previous terms, students have spent between 18 and 48 hours per exam working on these. Exams will be given out on the dates listed on this syllabus and will be due back to me no later than class time the following day after issue.   The final exam will be comprehensive and conducted during the scheduled final exam date and time. Overall the grading values will be: Tests and exam = 80%, lab assignments =20%.

Laboratory and Reports: Lab work will consist of wet lab assignments emphasizing hands on use of modern molecular genetic methods. Lab will meet in Room 2070, as scheduled. If lab protocols require more than the scheduled time block, students will then be responsible for completing the assignments and reports by scheduling access to the lab and materials with me. Each student is responsible for writing, and re-writing as directed, formal lab reports in the style of scientific papers, based on lab work as assigned by the instructor. Formal lab reports will be due as assigned. No late reports will be accepted for a grade.

Attendance: I assume that students in this class are adults and are responsible for their own attendance, study habits and behavior. **N**ote that missing class will mean missing a lot of material and it is unlikely a student can do well in this course without regular attendance. Students will be responsible for all assignments and materials, lecture and text regardless of attendance. Students should also be aware of the following university attendance policies: **(1) Students who miss 20% of lecture time will receive an automatic failing grade for the course. (2) Students who do not regularly attend lecture, as determined by taking class role, by the proof role date may be automatically dropped from the class. (3) Students who neither drop nor attend class by the midterm date will receive an automatic F for the course**. **Also note**: students **are responsible for the text and lecture material** on exams regardless of whether or not they come to class routinely. **It is unlikely that students can perform well on exams in this class with poor attendance.**

Some Basic Class Rules:
1. Turn in assignments on time. No late assignments will be accepted for a grade.
2. Do assignments exactly as instructed. Do not change formats, page lengths, or content.
3. Do not try to negotiate homework, test or lab assignments. They are not optional, nor changeable. They must be complete.

4. Be on time for tests, lectures and labs.
5. NO disruptive behavior will be tolerated (as defined in your student handbook, page 24). Anyone disrupting class will be asked to leave, perhaps permanently, may be dropped from the class or failed and this is solely at the instructors' discretion.
6. This course has a serious lab component. Often labs are long, demanding and may contain hazardous procedures. Behave safely and professionally in lab at all times or be dropped from the course. I do not kid about this!
7. **Honor Policy**: Cheating nor plagiarism will not be tolerated in this class and will be prosecuted to the full extent allowed by university policy and the law. Cheating and plagiarism will be considered to be any act as defined in the university handbook.

Dropping A Course Without Penalty: In order to officially drop a course without penalty, a student must obtain and fill out a drop/add form from the Registrar's Office, acquire appropriate signatures, and return the completed form to the Registrar's Office before the designated date (published in the academic calendar). If you don't officially withdraw, and instead just stop coming to class, you will receive an F for the course.

Family Educational Rights and Privacy Act: Grades cannot be posted by name, Social Security number or other personal identifiers, nor given out over the telephone.

ADA Statement: Students requesting classroom accommodations or modifications because of a documented disability must contact the Access Office for Students with Disabilities located in room 1115 Nevin's Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

.

Tentative Schedule: Please note that test dates are tentative and may change depending on the rate at which material is covered. Tests may be postponed but will never be moved ahead.

June
| | | |
Wednesday | 6– First Class Day
Friday | 8 – End of registration
Wednesday | 27- **Test 1**
Friday | 29- Midterm –last drop date

July
Wednesday | 4– **Holiday**
Tuesday | 24– Last class day – **Test 2**
Wednesday | 25- Study Day
Thursday | 26 – **Final Exam 8:00 am – 10:00 am**

Lecture topics: Readings will be assigned as the course progresses. Topics to be covered will include, but will not be restricted to:

1. detailed structure of prokaryotic and eukaryotic genomes
2. physical forms of DNA as it exists in native genomes
3. classes and numbers of gene types and DNA sequence types found in eukaryotic genomes
4. regulation of transcription and messenger RNA processing and function
5. operon structure and function models in eukaryotes, replicons and replication of nucleic acid
6. exon and introns in gene structure
7. nucleic acid restriction and cellular repair enzyme systems
8. recombination and mutation types and rates in eukaryotes
9. transposable elements in prokaryotes and eukaryotes
10. mitochondrial and chloroplast genomes, structure and function
11. molecular chromosome structure and function

Lab topics will focus on molecular genetic techniques and biotechnology used in genomic and population genetic analyses. Topics will include:

1. Genomic and mitochondrial DNA isolation and purification from eukaryote tissues
2. Enzyme modification of DNA
3. Electrophoretic techniques
4. Restriction enzyme analysis of genomic DNA
5. Southern blotting and DNA/DNA hybridization analysis of genomic DNA
6. Multilocus DNA fingerprinting
7. Cloning of genomic fragments into phage and plasmid vectors
8. Polymerase Chain Reaction (PCR) amplification and analysis of genomic DNA fragments
9. DNA sequence analysis of DNA fragments