BIOLOGY 327 --- GENETICS --- Spring 2013

Lectures: Tuesday & Thursdays in Room # TCNW 224, 2:20-3:40PM
Labs: Wednesdays in Room # EBS3109, 12:40-2:40PM or 3:00-5:00PM or 5:20-7:20PM

Homepage: http://blackboard.wku.edu Login using your Net ID and Password

Professor Info:

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Office Hours: by appointment
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Required Textbook: An Introduction to Genetic Analysis by Griffiths et al. 2008, 9th Edition (with *optional* Solutions Manuals). There is no laboratory manual to purchase. Handouts describing each of the laboratory exercises will be uploaded to Blackboard as the semester progresses.

Required Classroom Response System: Turning Point Clickers (available at the campus bookstore)

Teaching Assistants:

Kevin Tewell (Graduate Teaching Assistant)
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Nick Levis (Graduate Teaching Assistant)
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Course Description

Overview of the principles of genetics including concepts of heredity, molecular genetics, developmental genetics, genomics and population genetics. Laboratory exercises emphasize modern genetic techniques in two 80-minute lectures and one 2 hour long laboratory per week.

Course Objectives

- Investigate principles of heredity and patterns of inheritance
- Appreciate methods of gene mapping and the effects of linkage
- Describe mechanisms of replication and expression of genetic material
- Identify patterns of normal and abnormal chromosomal behavior
- Examine modern recombinant gene technology and genomics
- Introduce population and quantitative genetics

Expected Learning Outcomes

Upon completion of this course, students will be able to:

- Describe the genotypic and phenotypic effects of chromosomal events that occur during meiosis
- Apply the principles of Mendelian inheritance to predict the outcomes of genetic crosses and propose hypothesis tests
- Evaluate phenotypic patterns portrayed in human pedigrees and suggest a mechanism of inheritance
- Use experimental data to map prokaryotic and eukaryotic genes and assess genetic distances
- Summarize the important experiments that elucidated DNA as the genetic material
- Integrate the sequences of events that comprise replication, transcription and translation into an understanding of life on earth
- Understand the basic genetic design of animal development
- Predict the effects of major chromosomal alterations on phenotypic patterns and gamete formation
- Explain major methods and techniques used in molecular genetics to find and study genes of interest
- Calculate observed and expected allele frequencies and evaluate deviations from Hardy-Weinberg Equilibrium

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Course Schedule:

This schedule is intended only as a rough guideline for students and may be adjusted during the semester at the discretion of the instructor. A copy of this syllabus and copies of most laboratory exercises and homework assignments will be available at: http://ecourses.wku.edu. You will need your WKU email ID and password in order to access this web site.

Date		Topic	
22-Jan	T	Introduction to Genetics; DNA, Genes, & Chromosomes	Ch. 1
23-Jan	**W**	**No Labs**	
24-Jan	R	Mitosis & Meiosis Review	Ch. 2
29-Jan	T	Mendel's Laws: Single Gene Inheritance	Ch. 2
30-Jan	W	*Lab 1: Intro. to pipetting; Making buffers*	
31-Jan	R	Human Pedigree Analysis	Ch. 2
5-Feb	T	Mendel's Laws: Independent Assortment	Ch. 3
6-Feb	W	*Lab 2: DNA extraction; Working solutions*	
7-Feb	R	Cytoplasmic Inheritance	Ch. 3
12-Feb	T	Linkage: Breaking Mendel's Laws	Ch. 4
13-Feb	W	*Lab 3: Quantifying DNA; PCR*	

14-Feb	**R**	**Exam 1**	
19-Feb	T	Recombination Mapping	Ch. 4
20-Feb	W	*Lab 4: Restriction digests; Pouring gels*	
21-Feb	R	Bacterial Genetics 1	Ch. 5
26-Feb	T	Bacterial Genetics 2	Ch. 5
27-Feb	W	*Lab 5: Electrophoresis; Hardy-Weinberg Eqns*	
28-Feb	R	Viral Genetics	Ch. 5
5-Mar	T	Gene Interaction: Dominance & Pleiotropy	Ch. 6
6-Mar	W	*Lab 6: Intro. to working with Drosophila*	
7-Mar	R	Penetrance & Expressivity; Complementation	Ch. 6
12-Mar	T	**Spring Break – No classes**	
13-Mar	W	**Spring Break – No classes**	
14-Mar	R	**Spring Break – No classes**	
19-Mar	T	Discovery of the Hereditary Material, Replication	Ch. 7
21-Mar	W	*No Labs*	
22-Mar	**R**	**Exam 2**	
26-Mar	T	Transcription	Ch. 8
27-Mar	W	*Lab 7: Dissecting Drosophila larvae, use of GFP*	
28-Mar	R	Translation	Ch. 9
2-April	T	Regulation of Gene Expression in Prokaryotes - Operons	Ch. 10
3-April	W	*Lab 8: Preparing Drosophila Polytene Chromosomes*	
4-April	R	Regulation of Gene Expression in Eukaryotes	Ch. 11
9-April	T	Developmental Genetics	Ch. 12
10-April	W	*Lab 9: Gene expression, Isolation of plasmid DNA*	
11-April	R	Recombinant DNA Technology	Ch. 20
16-April	T	Transposable Elements	Ch. 14
17-April	W	No Labs	
18-April	R	**Exam 3**	
23-April	T	Chromosomal Rearrangement I	Ch. 16
24-April	W	*Lab 10A: pGLO Transformation I*	
25-April	R	Chromosomal Rearrangement II	Ch. 16
30-April	T	Population Genetics	Ch. 17
1-May	W	*Lab 10B: pGLO transformation II;* ***Lab Exam***	
2-May	R	Possible Review	
9-May	R	**Final Exam: 1:00PM-3:00PM**	

Grading:

There will be three Regular Exams during the semester plus one Final Exam during Finals Period. **Midterm Exams will be held during lectures.** The exams will primarily cover material discussed in the course lectures, but may also contain material presented during laboratory sessions. **There will be no make up exams.** If a student must miss a Regular Exam and presents a valid university excuse PRIOR to missing the exam, then the missed exam will be dropped and the remaining exam grades will be prorated to account for the missed points. Factors such as colds and minor illnesses, routine appointments with doctors, dentists, orthodontists, chiropractors, etc., and non-refundable airline reservations do not constitute valid reasons for missing an exam. **Trivial excuses will not be entertained.** The final exam is cumulative, but with an emphasis on the material presented subsequent to the 3rd Regular Exam. Each Regular Exam will be worth 10% of the final grade. The Final Exam will be worth 20% of the final grade. **There will be no opportunities for extra credit.**

For each laboratory exercise, there will be a worksheet with a set of questions and/or calculations that you will be expected to complete in lab and turn in at the end of each lab. Even though laboratory exercises will often be performed in pairs or groups, each student is individually responsible for their own answers on the worksheet written in their own words. Collectively, the laboratory will be worth 30% of the final grade.

Grade composition

3 Regular Exams (100 pts each)	300 pts
Final Exam	200 pts
10 Lab Worksheets	200 pts
10 Pre-lab Quizzes (5 points each)	50 Pts
In Class Problems + Clickers	200 pts
Wiley Plus Assignments	100 pts

Final grades will be assigned as follows:

A: 90 – 100%	D: 60 – 69%
B: 80 – 89%	F: Below 60%
C: 70 – 79%	W: Withdrawal by WKU Deadline

Expectations:

Students are expected to attend all lecture and laboratory meetings. Because we will be working with live organisms with complex life cycles in lab, **it will not be possible to make up missed laboratories.** Cheating, plagiarism and other forms of dishonesty are violations of academic integrity and will be dealt with according to university policy as outlined in the university catalog. You are responsible for monitoring the university's Academic Calendar for important dates relating to add/drop, withdrawal, etc.

Disabilities:

In compliance with university policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Office for Student Disability Services in Downing University Center, A-200. The phone number is (270) 745-5004. Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services.

The Learning Center:

Should you require academic assistance with your WKU courses, The Learning Center (located in the Downing University Center, A330) provides free supplemental education programs for all currently enrolled WKU students. TLC @ DUC offers certified, one-on-one tutoring in over 200 subjects by appointment or walk in. Online tutoring is offered to distance learners. TLC is also a quiet study area, with side rooms designated for peer-to-peer tutoring, and offers a thirty-two-machine Dell computer lab to complete academic coursework. Additionally, TLC has three satellite locations. Each satellite is a quiet study center and is equipped with a small computer lab. These satellites are located in Douglas Keen Hall, McCormack Hall, and Pearce Ford Tower. For more information, or to schedule a tutoring appointment, please call TLC at (270) 745-6254. www.wku.edu/tlc

Hours of Operation:

TLC @ DUC

Sunday	4:00pm – 9:00 pm
Monday – Thursday	8:00am – 9:00pm
Friday	8:00am – 4:00pm

TLC @ Keen

Sunday – Thursday	6:00pm – 11:00pm

TLC @ McCormack

Sunday – Thursday	6:00pm – 11:00pm

TLC @ PFT

Sunday – Thursday	6:00pm – 11:00pm

(PFT residents and their guests only)

Agreement Form

In order to remain enrolled in BIOL 327, you must print, complete and return this form to the instructor by the second meeting of class. Failure to submit a completed form by that date may cause you to be dropped from the course.
By submitting your name on this form you are agreeing to the following statement:

"I have read the BIOL 327 course syllabus and understand and accept its contents. I also understand that all work in this course must be my own, in my own words, and all required assignments, projects, and tests must be satisfactorily completed to receive a passing grade for this course. I understand that facilitating academic dishonesty (such as plagiarism) by another student is an academic offense for both students and both students will be penalized for such behavior. I stipulate that I have reviewed the following web sites:

http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml, http://www.plagiarism.org/

and understand what constitutes academic plagiarism. I further agree that is it my responsibility to withdraw or make other changes in my enrollment status, according to the policies and deadlines outlined in the University Catalog and/or Academic Calendar."

Signature_____

Print your
Name_____

Date_____

Semester
Taken_____