This is a tentative syllabus—the most recent version will be distributed via the class Blackboard site

BIOLOGY 327—GENETICS Summer 2017

Lecture Modules: Online recordings available via course Blackboard site

Required Materials: 1) Genetic Analysis: An Integrated Approach 2nd Ed. by Sanders and Bowman 2015.

2) An online subscription to Mastering Genetics

IMPORTANT–READ BELOW!!

I recommend you purchase access to Mastering Genetics with the e-text (ISBN-13: 978-0321856364) rather than purchasing the online material with the bound version of the text (ISBN-13: 978-0321979858). The WKU bookstore lists both as required, but you only need to purchase one or the other. Please purchase from the bookstore to avoid registration issues stemming from 3rd party vendors. The registration codes from the bookstore are modified to integrate with Blackboard.

Instructor: Dr. Jarrett Johnson
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Office Hours: TBD, and by appointment

Course Description

An overview of the principles of genetics including concepts of heredity, molecular and developmental genetics, genomics, and population genetics. Two 80-minute lectures per week.

Course Objectives

- Investigate principles of heredity and patterns of inheritance
- Illustrate 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 developmental 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
- Interpret the effects of differential patterns of gene expression during 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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Expectations:

Students are expected to purchase the required materials and watch all lecture modules. 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.

Grading:

There will be three Regular Exams during the semester plus one Final Exam. The exams will cover material from the textbook, online exercises, course readings/discussions and course lecture modules. Exams must be taken at a proctored examination center. Any requests to take an exam outside of the normal testing window must have present a valid excuse PRIOR to missing the exam, or appropriate documentation of the reason after the fact. Factors such as colds and minor illnesses, routine appointments with doctors, dentists, etc. do not constitute valid reasons for missing an exam. I will not tolerate trivial excuses. The final exam is cumulative, but with an overrepresentation of material presented subsequent to the 3rd Regular Exam. There will be no opportunities for extra credit and no "study guides". Please do not ask.

During the semester, problem sets and online material will be assigned using students' online access to Mastering Genetics (http://www.masteringgenetics.com/). Problem sets are to be completed in accordance with the course schedule. You will not be successful on the exams without completing the online exercises *and* practicing problems from the textbook, so access to both Mastering Genetics and the required e-text is essential. There is a study guide and solutions manual (ISBN-13: 978-0133795585)

associated with the text and your instructor will provide opportunities for review of problem sets and past exam questions prior to each Regular Exam

Prior to viewing each lecture module, students are expected to have read the assigned readings (text chapter, scientific papers, etc.) pertaining to that module's material and to have completed the assigned online exercises.

Grade composition

3 Regular Exams	300 pts
Final Exam	150 pts
Online Assignments	250 pts

Final grades will be assigned as follows:

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

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 http://www.wku.edu/sarc/. 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, please visit http://www.wku.edu/tlc.

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 homework assignments will be available at: https://blackboard.wku.edu/. You will need your WKU email ID and password in order to access this web site. Access to your Mastering Genetics account can be accomplished through the Tools menu from within the Blackboard site.

Unit	Module	SUGGESTED TIMELINE	Deadline	Ch.
Transmission Genetics	Introduction	5-Jun		1
	Principles of Transmission	5-Jun		2
	Probability	6-Jun		2
	Autosomal Pedigrees	6-Jun		2
	Chromosomes I	7-Jun		3
	Meiosis	7-Jun		3
	Sex-linkage	8-Jun		3
	Cytoplasmic Inheritance	8-Jun		19
	Exam 1		**9-Jun**	
Linkage and Mapping	Genic Interactions	12-Jun		4
	Quantitative Traits	12-Jun		21
	Epistasis	13-Jun		4
	Complementation	13-Jun		4
	Linkage	14-Jun		5
	Mapping	14-Jun		5
	Bacterial Genetics	15-Jun		6
	Viral Genetics	15-Jun		6
	Exam 2		**16-Jun**	
Molecular Genetics	DNA	19-Jun		7
	Chromosomes II	19-Jun		11
	Replication	19-Jun		7
	Transcription	20-Jun		8
	Translation	20-Jun		9
	Mutation	21-Jun		12
	Chromosomal Aberrations	21-Jun		13
	Prokaryotic Gene Regulation	22-Jun		14
	Eukaryotic Gene Regulation	22-Jun		15
	Exam 3		**23-Jun**	
Advanced Applications	Recombinant DNA Technology I	26-Jun		16
	Recombinant DNA Technology ii	26-Jun		17
	Genomics	27-Jun		18
	Developmental Genetics	28-Jun		20
	Population Genetics	29-Jun		22
	Final Exam		**30-Jun**	