General Course Syllabus
Western Kentucky University

BIOL 327 — Genetics

Instructor Information:
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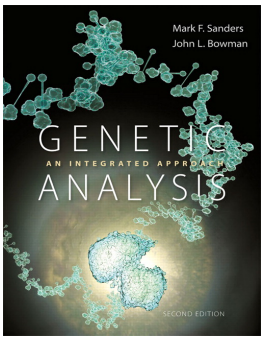
Office hours:
By appointment (schedule via email)

Course Materials:
1. Genetic Analysis: An Integrated Approach—Sanders and Bowman 2nd Ed.*
2. Online subscription to Mastering Genetics‡



* This course participates in The WKU Store's 'Day One Access program'. This program provides immediate access to the e-text at prices cheaper than other options. If you would like a paper copy of the text in addition to the e-text, older editions are likely available online for minimal cost.

‡ MasteringGenetics will be delivered to you automatically by enrolling in this course unless you choose to opt-out. The WKU Store will bill your Student Billing account, and you will see a charge appear under this term along with Tuition and Fees, labeled as "The WKU Store Purchases" after the Add/Drop period. To opt-out of participation, go to http://www.wkustore.com/t-day-one-access.aspx.

Pre-requisites:
BIOL120/212 and BIOL122/123 with a grade of C or better

Course Description and Expectations

An overview of the principles of genetics including concepts of heredity, molecular and developmental genetics, genomics, and population genetics. Students are expected to attend lectures, actively participate during in-class problem solving sessions, and complete online assignments. To be successful, students must actively engage in the online material and diligently practice their problem solving skills outside of class. Cheating, plagiarism and other forms of dishonesty are violations of academic integrity and will be dealt with according to university policy (see below, left). The student is responsible for monitoring the university's Academic Calendar for important dates relating to add/drop, withdrawal, etc.

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 genes
- Identify patterns of normal and abnormal chromosomal behavior
- Examine modern recombinant gene technology and genomics
- Introduce population and developmental genetics

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
- 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

University Policies:
As a WKU student enrolled in this course you have certain rights and entitlements established by federal law and described in University policies.

Information regarding the request of an accommodation under the Americans with Disabilities Act can be found by clicking on the "*ADA Accommodation*" tab at: https://www.wku.edu/syllabusinfo/

Information regarding the reporting of discrimination or harassment under Title IX of the Equal Opportunity in Education Act can be found by clicking on the "*Title IX Discrimination/Harassment*" tab at: https://www.wku.edu/syllabusinfo/

Students are required to maintain a civil and professional conduct in class. Information regarding academic integrity and the student code of conduct as described in the student handbook can be found by clicking the "*Things you should know*" tab at: https://www.wku.edu/syllabusinfo/

Cheating, especially in the form of plagiarism, will not be tolerated. It is OK, even advised, that students work with others to discuss concepts and develop new ideas. However, it must be evident that any submitted work is the individual effort of the student.

Additional mechanisms offered by the university, such as for the reporting of complaints and grievances, can be found under the "*If issues arise*" tab, and information regarding emergency preparedness and counseling/support can be found under the "Be prepared – Know where to go" tab at: https://www.wku.edu/syllabusinfo/

I will use a strict scale to determine final grades:
≥90% = A, ≥ 80% = B, ≥ 70 % = C, ≥ 60% = D, < 60 = F

Grading and Evaluation

There will be three Exams during the semester. The exams will cover material from the textbook, online exercises, 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 be accompanied by 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, you are expected to have read the assigned readings (text chapter, scientific papers, etc.) pertaining to that lecture's topic and to have completed the assigned online exercises.

4 Regular Exams: 400 pts (61%)
Online Assignments: 255 pts (39%)
Total: 655 pts

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 assignment schedule will be available at: https://blackboard.wku.edu/. Access to your Mastering Genetics account can be accomplished through the "Tools" menu from the menu bar within the Blackboard site.

Schedule of Lecture Topics

Unit	Module	SUGGESTED TIMELINE	Date Available	Deadline	Ch.
Transmission Genetics	Introduction	4-Jun	3-Jun		1
	Principles of Transmission	4-Jun	3-Jun		2
	Probability	5-Jun	3-Jun		2
	Autosomal Pedigrees	5-Jun	3-Jun		2
	Chromosomes I	6-Jun	3-Jun		3
	Meiosis	6-Jun	3-Jun		3
	Sex-linkage	7-Jun	3-Jun		3
	Cytoplasmic Inheritance	7-Jun	3-Jun		19
	Exam 1	8-Jun	3-Jun	**11-Jun**	
Linkage and Mapping	Genic Interactions	11-Jun	10-Jun		4
	Quantitative Traits	11-Jun	10-Jun		21
	Epistasis	12-Jun	10-Jun		4
	Complementation	12-Jun	10-Jun		4
	Linkage	13-Jun	10-Jun		5
	Mapping	13-Jun	10-Jun		5
	Bacterial Genetics	14-Jun	10-Jun		6
	Viral Genetics	14-Jun	10-Jun		6
	Exam 2	15-Jun	10-Jun	**18-Jun**	
Molecular Genetics	DNA	18-Jun	17-Jun		7
	Chromosomes II	18-Jun	17-Jun		11
	Replication	18-Jun	17-Jun		7
	Transcription	19-Jun	17-Jun		8
	Translation	19-Jun	17-Jun		9
	Mutation	20-Jun	17-Jun		12
	Chromosomal Aberrations	20-Jun	17-Jun		13
	Prokaryotic Gene Regulation	21-Jun	17-Jun		14
	Eukaryotic Gene Regulation	21-Jun	17-Jun		15
	Exam 3	22-Jun	17-Jun	**25-Jun**	
Advanced Applications	Recombinant DNA Technology I	25-Jun	24-Jun		16
	Recombinant DNA Technology II	25-Jun	24-Jun		17
	Genomics	26-Jun	24-Jun		18
	Developmental Genetics	27-Jun	24-Jun		20
	Population Genetics	28-Jun	24-Jun		22
	Exam 4	29-Jun	24-Jun	**2-Jul**	

Schedule of Assignments

Content Unit	Assignment	Points	Suggested Completion Date	Due Date
Exam 1	Chapter 2 Quiz	10	5 Jun	11 Jun
Exam 1	Chapter 2 HW	5	5 Jun	11 Jun
Exam 1	Chapter 3 Quiz	10	6 Jun	11 Jun
Exam 1	Chapter 3 HW	5	6 Jun	11 Jun
Exam 2	Chapter 4 Quiz	10	12 Jun	18 Jun
Exam 2	Chapter 4 HW	5	12 Jun	18 Jun
Exam 2	Chapter 5 Quiz	10	13 Jun	18 Jun
Exam 2	Chapter 5 HW	5	13 Jun	18 Jun
Exam 2	Chapter 6 Quiz	10	14 Jun	18 Jun
Exam 2	Chapter 6 HW	5	14 Jun	18 Jun
Exam 3	Chapter 7 Quiz	10	18 Jun	25 Jun
Exam 3	Chapter 7 HW	5	18 Jun	25 Jun
Exam 3	Chapter 8 Quiz	10	19 Jun	25 Jun
Exam 3	Chapter 8 HW	5	19 Jun	25 Jun
Exam 3	Chapter 9 Quiz	10	19 Jun	25 Jun
Exam 3	Chapter 9 HW	5	19 Jun	25 Jun
Exam 3	Chapter 12 Quiz	10	20 Jun	25 Jun
Exam 3	Chapter 12 HW	5	20 Jun	25 Jun
Exam 3	Chapter 13 Quiz	10	20 Jun	25 Jun
Exam 3	Chapter 13 HW	5	20 Jun	25 Jun
Exam 3	Chapter 14 Quiz	10	21 Jun	25 Jun
Exam 3	Chapter 14 HW	5	21 Jun	25 Jun
Exam 3	Chapter 15 Quiz	10	21 Jun	25 Jun
Exam 3	Chapter 15 HW	5	21 Jun	25 Jun
Exam 4	Chapter 16 Quiz	5	25 Jun	2 Jul
Exam 4	Chapter 16 HW	10	25 Jun	2 Jul
Exam 4	Chapter 17 Quiz	5	25 Jun	2 Jul
Exam 4	Chapter 17 HW	10	25 Jun	2 Jul
Exam 4	Chapter 18 Quiz	5	26 Jun	2 Jul
Exam 4	Chapter 18 HW	10	26 Jun	2 Jul
Exam 4	Chapter 20 Quiz	10	27 Jun	2 Jul
Exam 4	Chapter 20 HW	5	27 Jun	2 Jul
Exam 4	Chapter 22 Quiz	10	28 Jun	2 Jul
Exam 4	Chapter 22 HW	5	28 Jun	2 Jul
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