

BIOL 315 - GENETICS  
Fall 2007

Instructor: Rebekah A. Rampey, Ph.D.  
Office: Pryor Science Room 164D  
Phone: 279-5497  
Email: [rrampey@harding.edu](mailto:rrampey@harding.edu)  
Office hours: TBA - make appointments if possible

**Course Objectives**

This course is designed to introduce students to various aspects of genetics. A thorough understanding of genetics is crucial to anyone planning to pursue a career in any field related to biology. Topics will include some of the fundamental studies that comprise the foundation of modern genetics, as well as current trends in this fast-paced field.

**Course Resources**

Textbook: iGenetics. P.J. Russell. 2<sup>nd</sup> edition, Benjamin Cummings, 2006.  
Lecture outlines: Available from instructor for a minimal copy fee

**Class Lectures**

Some of the topics covered will be review from a course prerequisite, Cell Biology (BIOL 259), including DNA structure and replication, mitosis and meiosis, and the structures and functions of proteins. These areas will be covered briefly, therefore, you must have a solid understanding of this material.

Students are responsible for all material covered during class lectures and all information contained within the relevant chapters. You will be notified of any exceptions. See below for my recommended study habits.

**Class Quizzes**

We will have several quizzes at the beginning of the class period. Some will be scheduled, some will not. Students who arrive to class late or are absent will not be given a quiz. Escaping class lecture after finishing a quiz will result in a score of zero on that quiz.

There will be 6 quizzes (20 points each) during the semester. Five total quiz grades will be included in your final grade. Therefore, at least one quiz grade will be dropped. If a student has legitimate reason(s) for not having five quiz grades at the end of the semester, relevant makeup quizzes will be given during the final exam period, at the instructor's discretion. No other makeup quizzes are offered during the semester.

Quiz questions will generally concentrate on topics covered in class (not lab) since the prior quiz. Note that all material covered to date in both lectures and in the text may be included.

**Class Exams**

There will be four exams during the semester and a final. Exams will be given during laboratory sessions for more time allowance. Exam formats will include a mixture of multiple choice, true/false, fill-in-the-blank, short answer, and essay questions. Each exam will be

comprehensive up to that point in the course with emphasis over material covered since the last exam.

Exam dates are not set in stone. The lecture schedule indicates the chapters that will be included on each exam. When the relevant material has been covered in class, an exam will be confirmed and/or rescheduled for the following week.

If an exam is missed, a makeup exam can be taken during the final exam period along with the final exam. **\*\*There will be no makeup exams during the semester.\*\***

Tentative Exam Dates: Exam I – 9/13; Exam II – 10/4; Exam III – 10/25;  
Exam IV – 11/15

**Students with disabilities:** It is the policy for Harding University to accommodate students with disabilities, pursuant to federal and state law. Therefore, any student with a *documented disability* condition (e.g. physical, learning, psychological, vision, hearing, etc.) who needs to arrange reasonable accommodations, must contact the instructor and the Disabilities Office at the *beginning* of each semester. (If the diagnosis of the disability occurs during the academic year, the student must self-identify with the Disabilities Director *as soon as possible* in order to get academic accommodations in place for the remainder of the semester.) The Disabilities Office is located in Room 102 of the Lee Academic Center, telephone, (501) 279-4019.

### **Study Recommendations**

Mastery of the course material will not occur during classroom lectures. Instead, true understanding of the material occurs with dedicated intense study of both class notes and the text. Study with the goal of communicating the material to others in a complete and well-integrated manner. Practice properly using the terms and phrases contained in the material.

Achieving success in strenuous courses like genetics is a marathon, not a sprint. Stay caught up and study each week not only for the possibility of a quiz, but also for the next exam. It also is helpful to prepare for the topics discussed in the next lecture BEFORE the lecture. This means reading the relevant chapter and/or other reading material and reviewing lecture notes, if available. In addition, repeat these actions as soon as possible after every lecture. The latter actions will allow you to identify any topics that need more explanation or study. Begin setting aside significant time to study for each exam at least a week beforehand. Study with someone and verbally quiz one another, keeping in mind to focus on integrating the concepts into a “big picture” and not just memorizing facts.

### **Laboratory Sessions**

Laboratory sessions will occur weekly on Thursdays from 9:45 to 12:35 pm. Note that no exercises or experiments covered in lab will be available for makeup – DO NOT MISS LAB. 30% of the lab participation points will be deducted due to an unexcused absence OR severe tardiness (> 15 minutes). Due to the nature of the experiments in genetics lab, a portion of the experiment may be completed during lecture time. Therefore, skipping a lecture may result in missing part of the experiment. Lectures proceeding an exam are particularly good days to have lab time. When a portion of the experiment is missed due to an unexcused absence during lecture time, 20% of the lab participation points will be deducted upon each occurrence.

Lab sessions will vary in content; including lecture, problem exercises, discussion of assigned readings, and basic molecular biology techniques. There will be three main experiments completed during the semester, designated “molecular projects” 1 to 3. Students are encouraged to keep detailed lab notes and to master the protocols. After each project is complete, a written synopsis will be due at the times indicated on the schedule. Details regarding these reports will be provided at a later time. Material from these projects will be included in Exam IV.

### **Class Presentation**

Individual *Genetics in Medicine* presentations will be made during class/lab time on November 16 – Dec. 5. See attached sheets for further details. Please note that presentation slides for all presentations will be due on the following dates:

<u>Date of presentation:</u>	<u>Slides due to Dr. Rampey in class or email:</u>
Nov 16	Nov 9
Nov 26-30	Nov 16
Dec 3	Nov 26
Dec 5	Nov 28

### **Academic Integrity Statement**

Honesty and integrity are characteristics that should describe each one of us as servants of Jesus Christ. As your instructor, I pledge that I will strive for honesty and integrity in how I handle the content of this course and in how I interact with each of you. I ask that you join me in pledging to do the same.

Academic dishonesty will result in penalties up to and including dismissal from the class with a failing grade and will be reported to the Assistant Vice President for Academic Affairs. All instances of dishonesty will be handled according to the procedures delineated in the Harding University catalog.

### **Cell Phone and Pager Policy**

Please turn off phones and pagers during class and lab time. If you must, put the item on a vibrate setting and leave the room before answering. Any exceptions to this rule must be approved by the instructor. If phones or pagers are heard during class or lab, 20 points will be deducted from the final point total for the semester.

### **Syllabus Disclaimer**

While I have attempted to cover the major aspects of the course and my expectations of you in this syllabus, please do not hesitate to bring to my attention any questions you have concerning this course.

### **Schedule Disclaimer**

While I plan to adhere to the schedule provided, the depth of our discussions or breaking new information may force us to change the schedule slightly from time to time. Please do not panic when this happens.

## Final Grades

Final scores will be calculated based on the percentage of points earned out of the total points possible during the semester. Scores will be rounded to the nearest whole number and grades awarded by the scale below. See attached tentative schedule for the point breakdown and total points.

A: 89.5 – 100 %      B: 79.5 – 89.4 %      C: 69.5 – 79.4 %      D: 59.5 – 69.4 %      F: 59.4 % and below

### Points:

Exams I thru IV:	120 pts each x 4	= 480	Bioinfo. exercise:	25 pts	= 25
Quizzes:	20 pts each x 5	= 100	Final (Exam V):	120 pts	= 120
Lab synopses:	25 pts each x 3	= 75	Presentation:	75 pts	= 75
			Lab participation:	25 pts	= 25
					TOTAL = 900

## BIOL 315 Tentative Schedule, Fall 2007

- Dates in bold indicate “lab” days

DATE	TOPIC	TEXT
Aug 20	Introduction, Mitosis	Ch. 12 pgs. 302-306
Aug 22	Meiosis	Ch. 12 pgs. 306-312
<b>Aug 23</b>	Gene Function	Ch 4
Aug 24	Mendelian Genetics	Ch. 11
Aug 27	Extensions of Mendelian genetics	Ch. 11, 13
Aug 29	Extensions of Mendelian genetics	Ch. 11, 13
<b>Aug 30</b>	Epistasis/MM2 (plants in soil)	Ch 13
Aug 31	Sex-linked inheritance	Ch 12 pgs. 312-328
Sep 3	Sex determination	Ch 12
Sep 5	Eukaryotic gene mapping	Ch. 15
<b>Sep 6</b>	Eukaryotic gene mapping	Ch. 15
Sep 7	Transcription	Ch. 5
Sep 10	Transcription	Ch. 5
Sep 12	MM1 (plate seeds)	
<b>Sep 13</b>	Exam I	4,11,12,13,15
Sep 14	Transcription	Ch. 5
Sep 17	RNA processing	Ch. 5
Sep 19	MM1 (stain seedlings)	Ch. 5
<b>Sep 20</b>	RNA processing/MM1 (destain seedlings)	Ch. 5
Sep 21	Translation	Ch. 6
Sep 24	Translation	Ch. 6
Sep 26	Prokaryotic gene mapping	Ch. 18
<b>Sep 27*</b>	Prokaryotic gene mapping/MM2 – Introduction and DNA isolation	Ch. 18
Sep 28	Prokaryotic gene expression regulation	Ch. 19
Oct 1	Prokaryotic gene expression regulation	Ch. 19
Oct 3	TBA	
<b>Oct 4</b>	Exam II	Ch. 5,6,18

Oct 5	Prokaryotic gene expression regulation	Ch. 19
Oct 8	Eukaryotic gene expression regulation	Ch. 20
Oct 10	Eukaryotic gene expression regulation	Ch. 20
<b>Oct 11</b>	Eukaryotic gene expression regulation/ MM2 – PCR	Ch. 20/ Ch. 8/9
Oct 12	Genetics of development	Ch. 21
Oct 15	Genetics of development	Ch. 21
Oct 17	Genetics of development	Ch. 21
<b>Oct 18</b>	Genetics of development/MM2- gel electrophoresis	Ch. 21/ Ch. 8/9
Oct 19	Gene cloning	Ch. 8/9
Oct 22	Libraries and sequencing	Ch. 8/9
Oct 24	TBA	
<b>Oct 25</b>	Exam III	Ch. 19,20,21
Oct 26	Cancer	Ch. 22
Oct 29**	Cancer	Ch. 22
Oct 31	Cancer/MM3 – start cultures	Ch. 22
<b>Nov 1</b>	MM3 -DNA isolation, rest. digests	Ch. 8/9
Nov 2	DNA mutation	Ch. 7
Nov 5	DNA mutation	Ch. 7
Nov 7	DNA mutation	Ch. 7
<b>Nov 8</b>	Bioinformatics exercise /MM3 (electrophoresis)	Ch. 8/9
Nov 9	Variations in chromosome structure	Ch 17
Nov 12***	Variations in chromosome structure	Ch 17
Nov 14	TBA	
<b>Nov 15</b>	Exam IV	Ch. 8, 9, 22; MM1, MM2 and MM3; Bioinformatics
Nov 16	Genetics in Medicine Presentations	Slide outline and handouts
<i>Nov 19-23</i>	<i>Thanksgiving Break</i>	
Nov 26	Genetics in Medicine Presentations	Slide outline and handouts
Nov 28	Genetics in Medicine Presentations	Slide outline and handouts
<b>Nov 29</b>	Genetics in Medicine Presentations	Slide outline and handouts
Nov 30	Genetics in Medicine Presentations	Slide outline and handouts
Dec 3	Genetics in Medicine Presentations	Slide outline and handouts
Dec 5	Genetics in Medicine Presentations	Slide outline and handouts
<b>Dec 6</b>	Transposons	Ch 7
Dec 7	TBA	
Dec 13	FINAL (1:30-3:30 pm)	Ch. 7, 17, presentations

\* MM1 – Minimolecular project 1; Gene expression analysis in Arabidopsis

\*\* MM2 – Minimolecular project 2; SLP analysis in Arabidopsis

\*\*\*MM3 – Minimolecular project 3; Plasmid isolation, restriction digestion, gel electrophoresis

(Asterisks indicate Minimolecular project synopses due dates)

