

AGRO/ANSC/BIOL/HORT 305

PRINCIPLES OF GENETICS

Fall 2009

COURSE SYLLABUS

Class Times: Monday, Wednesday, Friday: Section 1: 8:30 am to 9:20 am
Section 2: 9:30 am to 10:20 am

Classroom: Gerald Thomas 336

Class Website: web.nmsu.edu/~gene305

Instructor: Dr. Champa Sengupta-Gopalan, Professor
Department of Plant and Environmental Sciences,
Graduate Program in Molecular Biology
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Graduate Teaching

Assistants: Olivia Wilson (Graduate Program in Molecular Biology)
Email: oliviaw@nmsu.edu

Martha Martinez Grimes (Graduate Program in Molecular Biology)
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Mark Seger (Graduate Program in Molecular Biology)
Email: mseger@nmsu.edu

Office Hours: Champa Sengupta-Gopalan --- By appointment (Skeen Hall, Rm N326)
Olivia Wilson --- By appointment (Skeen N325)
Martha Martinez Grimes -- By appointment (N325)
Mark Seger -- By appointment (Skeen N349)
(Please do not call on the lab, home or office phones. Use Email to set up appointments)

Help Sessions: Tuesdays ----- 5:00 to 6:00pm (Gerald Thomas 336)
(Recitation) Wednesdays -- 5:00 to 6:00pm (Gerald Thomas 336)

Review sessions: To be held before every exam. Dates will be announced in class.

Note: Each weekly help session will emphasize **first** the chapter(s) and homework problems assigned for class that week! The Help Sessions are designed to assist you with the current material throughout the semester. Please work on the homework problems on your own before you ask for

help in the help sessions. The review sessions before an exam will review the material that will be covered in that particular exam.

Required Textbook: Genetics. Analysis & Principles. By Robert J. Brooker. 3rd edition

Homework: There will be homework assignments that will be handed a week before the day it has to be turned in. The date for turning in the homework assignment is indicated in the class schedule. **No homework assignments will be accepted late.** These assignments **will be turned in for extra credit.** The homework problems will be graded for correctness. Just providing the final answer to homework problems is not enough to get full credit. **You will see similar work problems on the exams.** Thus, completion and understanding of the homework assignments are essential for good performance on exams.

Quizzes: There will be eight in-class quizzes, of which the top five will be used for scoring. Each quiz will be worth 10 points. The time of the quiz will be announced in class and the quizzes will be over the material covered since the last quiz or exam and also the previous homework assignment.

Examination:

a) There will be three midterm exams and a final exam which will be partly comprehensive and will partly cover the material since the last midterm. See the attached “Course Outline” for exam dates. A score for all the 4 exams is required to obtain a final grade.

b) No exam will be given before or after the date listed on the Course Outline. No exam will be given at times other than the scheduled class times on that date (you may take the exam during the other section’s time period if necessary). If you must miss a scheduled exam, you will have to discuss your options with Dr. Gopalan and provide medical documentation or some valid excuse for the necessity of missing an exam.

c) Exams will include questions pertaining to both the current material covered in class, material from the current assigned readings in the textbook, and homework problems (not necessarily covered in class). You are advised to keep up with the current assigned readings and homework. In addition, **each of the exams #2 through #4 may include questions relating to material covered on previous exams, thus rendering the exams partially cumulative in nature.** The topic(s) of the “cumulative” questions will be announced in the review sheets that will be handed out before each exam, so that you can focus your study on the relevant material. However, each section will be building upon knowledge gained in previous sections of the course, so the material is inherently “cumulative” in nature.

d) An example of a previous exam is attached for your review as to the format and style of questions. Note that there are a variety of question styles including multiple choice, true or false, fill in the blank, and work problems similar to those assigned as homework. The work problems usually make up about half of the points on each exam. If you do the homework as part of the your study regime, you should have no trouble finishing the exam because you will recognize the problems. If you do not do the homework problems, you are not likely to finish the exams because the problems will be unfamiliar and thus require much more time to complete.

e) Please refer to the NMSU Student Handbook, Code of Conduct, Section III.A., regarding policies of plagiarism.

Grade Scale:

a) Each midterm exam will be worth 100 points. The final exam will be worth 50 points (new material) + 100 points (comprehensive section) = total 150 points. Grades on individual exams will then be calculated on a percentage basis and assigned a letter grade to facilitate your self-monitoring.

b) The weekly homework problem sets turned in every Monday together will be worth 50 points extra credit. This extra credit is worth the equivalent of 10% of your final grade, a whole letter grade! (Not to mention that doing the homework will improve your exam grade).

c) A total of four exam grades and the quiz grades are required to calculate a final grade (500 points = 100% average). The extra credit opportunity via homework raises the total points possible to 550 (calculated as 110% for final grades).

d) Grades for each exam and final grades for the course will be assigned on the following average percentage basis:

90 - 91.5%	=A ⁻	92 - 97.5%	=A	98 - 100+%	=A ⁺
80 - 81.5%	=B ⁻	82 - 87.5%	=B	88 - 89.5%	=B ⁺
70 - 71.5%	=C ⁻	72 - 77.5%	=C	78 - 79.5%	=C ⁺
60 - 61.5%	=D ⁻	62 - 67.5%	=D	68 - 69.5%	=D ⁺
		0 - 59.5%	=F		

Students

"Feel free to call **Jerry Nevarez**, Director of Institutional Equity, at 575-646-3635 with any questions you may have about NMSU's Non-Discrimination Policy and complaints of discrimination, including sexual harassment.

Feel free to call **Carol Brown**, Coordinator of Services for Students with Disabilities, at 575-646-6840 with any questions you may have on student issues

related to the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act of 1973. All medical information will be treated confidentially. If you believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Service for Students with Disabilities Office located in Garcia Annex (telephone 646-1921). Appropriate accommodations may then be provided for you. If you have a condition which may affect your ability to exit safely from the premises in an emergency or cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the director of the Services for Students with Disabilities.

**A Formula
for Student
Success:**

You should be successful in this course if you:

- a) Read each assigned reading at least once before class as indicated in the attached “Course Outline”. **Read the lecture outline** that is handed out in class and also posted on the website.
- b) Make sure you understand the basic concepts and focus on the material within the chapter that is being emphasized in the class and in the lecture outline.
- c) Attend class to get any “extra” information on the current topic not presented in the textbook.
- d) Re-read the assigned readings again after class as many times as necessary to gain a thorough comprehension of the emphasized material.
- e) Do the assigned Homework Problems and learn all the important concepts and terminology from your study guide.
- f) Attend the weekly help sessions or make appointments with your teaching assistants for assistance with your questions concerning the current material or with any difficulties you encounter in doing the homework problems.
- g) Study continuously throughout the semester.

**Course and
Instructor’s
Objectives**

- a) To provide an introduction to the basic concepts, methods, and terminology of genetics.
- b) To develop a working understanding of genetics and heredity.
- c) To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
- d) To get a good theoretical knowledge of the techniques used in recombinant DNA technology.
- e) To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.
- f) Introduction to genomics and bioinformatics.

Course Schedule and reading assignments:

Date	Day	Topic	Reading Assignment
Aug 21 Aug 24	F M	Introduction to Genetics; Science of Genetics	Chpt 1, pgs 1-16
Aug 26 Aug 28	W F	Mendelian Inheritance	Chpt 2, pgs 17-43
Aug 31	M	Reproduction and Chromosome transmission (HW#1 due)	Chpt 3, pgs 44-70
Sept 2 Sept 4	W F	Extension of Mendelian Genetics (contd)	Chpt 4, pgs 71-99
Sept 7	M	Holiday	
Sept 9 Sept 11	W F	Linkage and genetic mapping in eukaryotes (Contd) Review Session (GT336)	Chpt 5, pgs 100-117 Pgs 125-132
Sept 14	M	Exam #1	
Sept 16	W	Variation in chromosome structure and number	Chpt 8, pgs 187-220
Sept 18 Sept 21	F M	Molecular structure of DNA and RNA (Contd)	Chpt 9, pgs 221-246
Sept 23	W	Chromosome organization and molecular structure	Chpt 10, pgs 246-269
Sept 25 Sept 28	F M	DNA replication (contd)	Chpt 11, pgs 270-296
Sept 30 Oct 2	W F	Gene transcription and RNA modification (HW#3 due) (contd)	Chpt 12, pgs 297-323
Oct 5 Oct 7 Oct 9	M W F	Translation of mRNA (contd) (HW#4 due) (contd) Review session (GT336)	Chpt 13, pgs 324-359
Oct 12	M	Exam No. 2	
Oct 14 Oct 16	W F	Gene regulation in bacteria (contd)	Chpt 14, pgs 360-377 Pgs 384-388
Oct 19	M	Gene regulation in eukaryotes	Chpt 15, pgs 389-423

Oct 21	W	Gene regulation in eukaryotes (contd)	
Oct 23	F	Gene mutation and DNA repair	Chpt 16, pgs 424-454
Oct 26	M	Recombinant DNA technology (HW#5 due)	Chpt 18, pgs 482-513
Oct 28	W	(contd)	
Oct 30	F	(contd) Review session (GT336)	
Nov 2	M	Exam #3	
Nov 4	W	Biotechnology	Chpt 19, pgs 514-541
Nov 6	F	(contd)	
Nov 9	M	Genomics I: Analysis of DNA	Chpt 20, pgs 542-570
Nov 11	W	(contd)	
Nov 13	F	(contd)	
Nov 16	M	Genomics II: Functional Genomics; Proteomics;	Chpt 21, pgs 571-598
Nov 18	W	(contd) Bioinformatics (HW#6 due)	
Nov 20	F	(contd)	
Nov 23	M	Thanksgiving holidays	
Nov 25	W		
Nov 27	F		
Nov 30	M	Medical Genetics and Cancer	
Dec 2	W	(contd) (HW#7 due)	
Dec 4	F	(contd) Review session (GT336)	Chpt 22, pgs 599-631

Final Exams:

Section 2: Dec 10, Monday (8:00 am - 10:00 am)

Section 1: Dec 12, Wednesday (8:00am - 10:00 am)

