



Syllabus for Genetics I

GNS, PO, & BIO 3103

COURSE: GNS/PO/BIO 3103, GENETICS I, Fall Session, 2008

INSTRUCTORS: Dr. E. David Peebles, Mr. Madhu Keralapurath, and Ms. Anberitha Matthews

PAPERS FOR OUTSIDE READING: Available on/in: 1) MyCourses 2) Hard copies on blue table outside room #208 of Hill Poultry Science bldg. for 8 AM to 5 PM (do not remove copied material).

WORKBOOK: Peebles, Study Guide for Introductory Genetics, Revised 3rd Edition, 2008, University Bookstore (The Depot), Campus Book Mart, and Bully's Textbooks.

TEXT: Klug/Cummings/Spencer, Essentials of Genetics, 6th Edition, 2007, and Nickla, Student Handbook and Solutions Manual, 6th Edition, 2007, University Bookstore (The Depot), Campus Book Mart, and Bully's Textbooks.

RECOMMENDED SUPPLEMENT TO TEXT: Elrod and Stansfield, Schaum's Outline Series - Genetics, 4th Edition, 2002.

LECTURE RECORDING: Students are permitted and are encouraged to electronically record lectures. **This has proven to be highly effective toward improving class performance.**

RECOMMENDED SUPPLEMENT WEBSITE MATERIAL:

<http://www.prenhall.com/klug4/>

ROOMS:

Lecture: McCool Hall, Rm 100

Laboratory: Hill Poultry Science Bldg., Rm 117 (Classroom)

1.

| HOURLY TESTS | Percentage of Grade | Date |
|--------------|--|---------------------------------|
| 1 | 20% | Sept. 10, 2008 (Wed.) |
| 2 | 20% | Oct. 1, 2008 (Wed.) |
| 3 | 20% | Oct. 22, 2008 (Wed.) |
| 4 | 20% | Nov. 12, 2008 (Wed.) |
| FINAL EXAM: | 20% or 40% (last 25 questions are comprehensive) | Dec. 9, 2008 (Tues.) 12-3 PM |

2. No cell phones, PDA's, iPods, hats/caps/visors, sunglasses, food, or drink are permitted in the room during testing. Any material (i.e. paper, calculator, cell phone, etc.) passed between students during a test will be confiscated (calculators will be replaced with a proctor's calculator). Calculators or other electronic devices capable of text storage are not permitted for use during testing. All calculators will be examined by a proctor. Calculators loaned to students from a proctor during testing must be checked out and returned at the end of the test (see checkout list on calculator box). Any behavior suspected as cheating by the proctors, whether intentional or unintentional, will be dealt with accordingly in an immediate manner by the proctor. Individuals with wandering eyes may be relocated to a different seat. All baseball caps must be removed or the bills must be pointed to the rear. Cheating which has been verified through witness and/or evidence will be punished as outlined in the university catalog. Answers that have been changed after test taking and grading that come to our attention will be considered as cheating and the penalty will be a score of 0 for the test involved.

[Mississippi State University Honor Code](#)

“As a Mississippi State University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do.”

Upon accepting admission to Mississippi State University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the MSU community from the requirements or the processes of the Honor Code. For additional information please visit: <http://www.msstate.edu/dept/audit/PDF/1207a.pdf>

3. Makeup tests are given only when the day of the exam is missed and not for missing days prior to or after the exam day. Makeup tests are also given only for those reasons listed below according to MSU academic operating policy and procedure (AOP). Excuses must be in the form of an original signed and dated letter from the person(s) authorizing the excuse. The authority's name and phone number must be provided for confirmation. Excuses for funerals must be accompanied by the name and phone number of the funeral director for confirmation and an obituary clipping containing the student's name. Makeup exams must be taken within six calendar days of the end of the excused time period.

REASONS THAT ABSENCES ARE CONSIDERED EXCUSED:

Participation in an authorized university activity.

Death or major illness in a student's immediate family.

Illness of a dependent family member.

Participation in legal proceedings or administrative procedures that require a student's presence.

Religious holy day.

Illness that is too severe or contagious for the student to attend class (to be determined by a physician).
Required participation in military duties.
Mandatory admission interviews for professional or graduate school which cannot be rescheduled.

4. One of the first four 1-hour test grades may be dropped. If one of those tests is missed for whatever reason, then that will count as your drop grade. Only one hour test may be missed.

5. A 40% final (last 25 questions are comprehensive) will be given to those students who either miss or decide to drop an hour test. That final test score will then be counted double (40%), in that it will count as the Test # 5 score and will also replace the score for the test you have dropped or missed, if it is higher. If all first four test scores are kept, then the final will be an hour test, only covering material since Test # 4. All final tests, without exception, must be taken at the time designated in the University Master Schedule. All end-of-term final grades are non-negotiable. There are no other out-of-class means by which to earn extra points to adjust a final grade.

6. Questions concerning grades or material must be addressed prior to exams and grade assignments. All questions concerning course material are welcomed by the instructor and teaching assistants prior to tests. Please do not complain if a problem was not clear immediately before a test. It will be too late to discuss grades or "what could I have done to make a better grade" after the course has been completed. Please feel free to come in for help before the test. There are no "stupid" questions.

7. Pop lecture and lab quizzes will be given as extra points. The scores from the quizzes will be added to your other test scores. No makeup bonus quizzes will be given. Points from the bonus quizzes will be used to increase the class average as necessary. Pop quiz points are used for grade adjustment. Final grade cut-offs are strictly made according to the following scale: 85.0 or above = A, 75.0 or above = B, 65.0 or above = C, 55.0 or above = D. In-class pop quiz questions may be taken from the computer lab genetics software as well as class notes, power point slides, workbook, and supplementary reading. Students should stay abreast of the appropriate software material. Attendance is important and will be recorded for lectures and labs (sign-ins on day of attendance only). Random in-class attendance verifications will be conducted to monitor false sign-ins. Three (including the day of the false sign-in) total attendances will be deducted for false sign-ins. Enter your MSU netID beside your name on the register sheet. The attendance roster will only be available for the first 15 minutes (8:15 AM for lecture and 1:15 PM and 3:15 PM for labs) of the class time period. Arrivals after those times will be counted as an absence. The roster will be checked again for attendance at the conclusion of each lab. Sign-ins will be deleted from the roster for students that are absent at that time without an excuse. Attendance cannot be adjusted at a later time. Remembering to sign the attendance roster is the student's responsibility. Excused and unexcused absences as well as forgetting to sign in are considered the same as an absence. No attendance bonus points are given for absences even if excused. Students with excuses are not penalized for being absent; however, bonus points are not given for missing class.

8. Academic Operating Policy 10.08, classroom regulations, prohibits student use of cell phones, messaging devices and other electronic devices in the classroom unless authorized by the instructor. Any item deemed as a distraction (cell phones, games, etc.) by the instructor will be confiscated until the end of the class lecture, lab or test period.

9. Students are responsible for all the material presented in class and lab (including information in the Power Point presentations), and from the workbook, assigned reading, computer software, and textbook problems. All outside help and tutoring must be by appointment. Please see office hours for lab T. A.'s most available times. Help and tutoring will be limited to either Rm 117 or the second floor student lounge (Computer Lab) of the Hill Poultry Science Bldg. No students are permitted in Rm 210 (Research Laboratory).

10. Test keys will be posted (in display case) to the right of the front door (under stairs) of the Hill Poultry Science Bldg., for 3 weeks following each test. Thereafter, keys will no longer be available for review. Graded test and quiz scantron answer sheets will be made available for pick up from your T.A. after lab. Current scores can be accessed on MyCourses.

11. MAJOR TOPIC OBJECTIVES OF GENETICS I:

- i) To understand concepts of gene structure and function and possible interaction between allelic and nonallelic genes.
- ii) To be able to perform hybrid crosses involving one or more gene pairs, and predict their results (laws of probability).
- iii) To understand concepts of gene expression including replication, transcription, and translation.
- iv) To understand relationships between genes and chromosomes and their roles in sex determination, chromosome mapping, and various genetic abnormalities.
- v) To understand common methods of modern recombinant DNA technology.
- vi) To be able to use various genetic principles, concepts and terms for work in more advanced science classes, in determining methods of inheritance of particular characteristics in various species of plants and animals, and in understanding current media topics.

PAPERS FOR OUTSIDE READING

For Test 1

- i) The Importance of Context in Genetics

For Test 2

- i) What Controls the Cell Cycle
- ii) The Centrosome
- iii) The Nucleosome
- iv) The Other Human Genome

For Test 3

- i) Animal Sexuality
- ii) Zeroing in on the Sex Switch
- iii) Drosophila melanogaster video script

For Test 4

- i) Molecular Structure of Nucleic Acids
- ii) James Watson and the Search for Biology's Holy Grail

For Test 5

- i) Smart Genes (Trends in Biology)
- ii) Transgenic Livestock as Drug Factories
- iii) Sunlight and Skin Cancer
- iv) A New Genetic Code
- v) DNA's New Twists (Trends in Genetics)

Scanned articles for assigned reading will be available on MyCourses and in the computer room on computers 1, 2, 3, 4, 5, and 7. These articles on the computers are in Adobe (pdf) format. If you have difficulty viewing them go to "view" and "zoom" until the article is clearly viewed. Also, there is only one hard copy of each article available, and they can be found attached to the blue table outside Room #210. **However, articles are not to be removed from the blue table for any reason.**

INSTRUCTORS

PEEBLES: OFFICE: Room 208

TELEPHONE NUMBERS: OFFICE - 325-3379, DEPARTMENT- 325-3416

E-MAIL ADDRESS: dpeebles@poultry.msstate.edu

LECTURE HOURS: 8 - 8:50 AM (Monday and Wednesday)

ADDITIONAL HELP BY APPOINTMENT

MADHU: OFFICE: Room 210

POULTRY SCIENCE STUDENT LOUNGE (FOR TUTORING), BY APPOINTMENT

TELEPHONE NUMBERS: OFFICE - 325-8220, DEPARTMENT - 325-3416

E-MAIL ADDRESS: madhu@poultry.msstate.edu

LAB HOURS:

1:00 - 2:50 P.M. (Mon.)

3:00 - 4:50 P.M. (Mon)

ADDITIONAL HELP BY APPOINTMENT

MATTHEWS: OFFICE: Room 210

POULTRY SCIENCE STUDENT LOUNGE (FOR TUTORING), BY APPOINTMENT

TELEPHONE NUMBERS: OFFICE - 325-8220, DEPARTMENT - 325-3416

E-MAIL ADDRESS: amatthews@poultry.msstate.edu

LAB HOURS:

1:00 - 2:50 P.M. (Tues.)

3:00 - 4:50 P.M. (Tues.)

ADDITIONAL HELP BY APPOINTMENT**ENROLLMENT AND CLASS MAINTENANCE PROBLEMS**

SHARON WOMACK: OFFICE: ROOM 210

TELEPHONE NUMBERS: OFFICE - 325-8220, DEPARTMENT - 325-3416

E-MAIL ADDRESS: swomack@poultry.msstate.edu

TEXT READING AND PROBLEMS

1. INTRODUCTION TO GENETICS. Chapter 1:1-16.
2. *(WB:1-112) MENDELIAN GENETICS. Chapter 3:38-60. Problems # 1-30. MODIFICATION OF MENDELIAN RATIOS. Chapter 4:61-64 (Skip 4.5.) 65 (Skip 4.9., 4.10., and 4.11.), 77-80 (Skip 4.13.). Problems #1, 2, 4-9, 12, 15, 17-20, 22-26, 28-31.
3. *(WB:113-152). MODIFICATION OF MENDELIAN RATIOS (4.13.). Chapter 4: 80-93. Problems #33-37. CHROMOSOME STRUCTURE AND DNA SEQUENCE ORGANIZATION. Chapter 11:235-252. Problems #1-29. MITOSIS AND MEIOSIS. Chapter 2:17-37. Problems #1-31. CELL-CYCLE REGULATION AND CANCER. Chapter 16: 357-375
4. *(WB:153-182). SEX DETERMINATION AND SEX CHROMOSOMES. Chapter 5:94-113. Problems #1-33. MODIFICATION OF MENDELIAN RATIOS (4.10., 4.11.). Chapter 4:73-77. Problems #10, 11, 13, 14, 16, 32.

5. *(WB:183-232) DNA STRUCTURE AND ANALYSIS. Chapter 9:188-212. Problems #1-35. DNA REPLICATION AND SYNTHESIS. Chapter 10:213-234. Problems #1-32. THE GENETIC CODE AND TRANSCRIPTION. Chapter 12:253-276. Problems #1-32. TRANSLATION AND PROTEINS. Chapter 13:277-302. Problems #1-24. REGULATION OF GENE EXPRESSION. Chapter 15:329-335 (Skip 15.3-15.5), 338-356.
6. *(WB:233-256) LINKAGE AND CHROMOSOME MAPPING IN EUKARYOTES. Chapter 7:136-163. Problems #1-32.
7. *(WB:257-272) CHROMOSOME MUTATIONS: VARIATION IN NUMBER AND ARRANGEMENT. Chapter 6:114-135. Problems #1-30. DNA REPLICATION AND SYNTHESIS (10.8.). Chapter 10:228-234. Problems #22-32. GENE MUTATION, DNA REPAIR, AND TRANSPOSITION. Chapter 14:303-328. Problems #1-32.
8. *(WB:273-296) MODIFICATION OF MENDELIAN RATIOS (4.5.). Chapter 4:64-65. Problems #3, 21, 27, 31-37. POPULATION GENETICS. Chapter 22:489-513. Problems #1-26.
9. *(WB: 297-316) RECOMBINANT DNA TECHNOLOGY. Chapter 17: 376-398.

* Related page numbers in workbook are provided in parentheses beside unit numbers.

READING MATH PROBLEMS

Here are some general rules to follow to help you when reading word problems.

- Read the problems completely. Ask "What is this all about?" Take a good look at pictures, diagrams, or charts that may go with the problem. Read through fast.
- Decide what is asked for. What are you asked to do? Write it down. You can't decide what information you need until you know what you are trying to find. Check and see if you are asked for more than one thing. Look for key words - find, prove, how many, show, what is, give, sum, difference, total, etc.
- Reread the problem. You may have to reread it several times to get all the information you need. Read really slow.
- Ask, "What facts are given?" Get rid of all information not absolutely necessary and then list known facts.
- Put as much as possible into mathematical terms. Look for words like - average, area, distance, speed.
- Draw a diagram or picture whenever possible.
- Estimate a logical answer. This will give you a good clue where you are going.
- Decide on a method to solve the problems. There may be more than one way to do it. There may also be many steps to get to the final solution. Write down all formulas that may apply to the problem and

see which you can actually use.

- Don't give up if you can't reach a final solution - doing part of a problem is better than doing none of it. There is part credit on most math tests; you will probably get a point or two for just writing the appropriate formulas.

- Check your work. Compare with estimate.

GENERAL TIPS

- Read all directions carefully and follow all of them in an orderly way.

- Read all numbers and symbols carefully. Watch for decimal points and commas.

- Do not read into the problem something that is not there.

- After reading and rereading, get your pencil moving. Never sit and stare at a problem. If nothing else, made doodles and sketches based on what the problem has told you. Play with possible methods. Very often you trigger ideas that set you on the track to solving the problem.

- The only way to study math is by **PRACTICING PROBLEMS**. Go over sample problems in the book and go over problems the teacher did in class. Also get old tests if you can and do as many problems as possible. But don't practice doing problems incorrectly - check with your teacher or your tutor and make sure you are using proper techniques.

- Memorize all the formulas you may need.

- The night before a test, check your calculator batteries. If the batteries are dying, the calculator will give you nonsense numbers.

- Numbers can seem to be nonsense to the instructor if you don't write them clearly; it is very easy to write 7s, 2s, and z's so that they can't be told apart. Be careful, be accurate, and be neat.

- Above all - stay calm. If you still can't work it after following all the steps, go on to another one. Maybe if you come back to it later, it will make more sense then.

SUGGESTIONS FOR TAKING CLASS NOTES:

1) Take complete notes on full size paper.

2) Keep your notes in a standard-size binder. You will be able to add additional handouts and library information to your binder.

- 3) Record any information given during the lecture which you believe will be important. Empty pages and spaces in your course workbook are good places to record this information.
- 4) Record important terms and label them with a question mark ("??") to remind yourself to look them up and commit them to memory.
- 5) Summarize and list key words/phrases.
- 6) After the lecture you should read the notes, fill in notes that you missed, make your writing legible, and underline any important materials. Ask another classmate for their notes if you missed something during lecture.
- 7) You should reflect on the information you received during the lecture. Determine how your ideas fit in with the information.
- 8) Cover the notes you took for your class. Test yourself.
- 9) If you look over your notes again you will remember more when you take your test.

INSTRUCTIONS FOR MYCOURSES USE

From MSU home page choose:

- a. onCampus
- b. MyCourses
- c. Academic MyCourses
- d. log in your net id and password
- e. Genetics I

INSTRUCTIONS FOR INTERNET USE

From MSU home page choose:

- a. Academic Programs
- b. Colleges and Departments
- c. Department of Poultry Science
- d. Academic Courses
- e. PO 3103 ... Genetics I (also GNS & BIO 3103)

ITEMS AVAILABLE ON THE GENETICS I SITE:

Syllabus

Test 1 from 1993 and 1994

Test 2 from 1993 and 1994

Test 3 from 1993 and 1994

Test 4 from 1993 and 1994

Test 5 (40% final - first 25 questions are same as 20% final) from 1993 and 1994

Answers to sample problems

Drosophila melanogaster video script

Power Point Lecture Slides (24 lectures)

Grades can be accessed on myCourses.

**ACTIVATE YOUR EMAIL ADDRESS WITH INFORMATION TECHNOLOGY SERVICES
(I.T.S.)
AND CHECK YOUR MESSAGES OFTEN.**

TO ACTIVATE YOUR EMAIL ADDRESS WITH I.T.S.:

- 1) At the MSU home page, in the Local Topic Search box type: " information technology services".
 - 2) Choose: Student Email
 - 3) Choose: Step-by-step- instructions for configuring official student email
 - 4) It is the obligation of each student to activate his or her email account, to routinely check it for new messages, and to keep it in good working condition.
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For information about Mississippi State University, contact msuinfo@ur.msstate.edu.

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