

BIOL 3200, Introductory Genetics
Fall Semester 2014, Section A (CRN# 81760, 3 Credit hours)
Department of Biology, College of Arts & Science, Valdosta State University

Lecture (BC 1011): T & R 2:00 p.m. – 3:15 p.m.

Instructor: Dr. Brian C. Ring
Office: **BC 2084**
Office hours: **T & R 11:00 a.m. – 12:00 p.m.** or by appointment.
Phone: 249-4841 (Dept. office 333-5759)
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Graduate Assistant: TBD
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Pre-Requisites: MATH 1112 or 1113, BIOL 1107, and 1108 or permission of instructor.

Course Description: A survey of modern genetics including Mendelian modes of heredity; extensions and variations on Mendelian genetics; chromosomal inheritance and variation; molecular properties of genes; plus basic quantification of genetic diversity at the population level.

Course Outcomes: Upon completion of this course the student should be able to:

- 1) Comprehend the basic terminology & principles of modern Mendelian Transmission Genetics from cellular meiosis to phenotype in the organism and relatedness to other sub-fields of genetics: Molecular & Population (**BO2, BO3, & GE4, & GE7**);
- 2) Extend upon basic Mendelian principles the understanding of chromosomal inheritance and how genes are regulated in an organism and quantified for a species within a population (**BO2, BO4, & GE4**);
- 3) Solve basic and more complex Mendelian genetics in the form of ratios/probabilities, chi-square test, pedigrees, and quantitative population genetic problem sets (**BO1, BO4, BO5, GE3, GE5 & GE7**).

These course outcomes support the VSU Biology Department Outcomes # 1-5 and the University General Educational Outcomes # 3, 4, 5 & 7 as listed in the VSU Undergraduate Catalogue (see below).

VSU Biology Department Objectives:

- BO1.** Develop and test hypotheses, collect and analyze data, and present the results and conclusions in both written and oral format used in peer-reviewed journals and at scientific meetings.
- BO2.** Describe the evolutionary process responsible for biological diversity, explain the phylogenetic relationships among the other taxa of life, and provide illustrative examples.
- BO3.** Demonstrate an understanding of the cellular basis of life.
- BO4.** Relate the structure and function of DNA/RNA to the development of form and function of the organism and to heredity.
- BO5.** Interpret ecological data pertaining to the behavior of the individual organism in its natural environment; to the structure and function of populations, communities, and ecosystems; and to human impacts on these systems and the environment.

VSU General Educational Outcomes:

- GE1.** Students will demonstrate understanding of the society of the United States and its ideals.
- GE2.** Students will demonstrate cross-cultural perspectives and knowledge of other societies.
- GE3.** Students will use computer and information technology when appropriate.
- GE4.** Students will express themselves clearly, logically, and precisely in writing and in speaking, and they will demonstrate competence in reading and listening.
- GE5.** Students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices.
- GE6.** Students will demonstrate knowledge of diverse cultural heritages in the arts, the humanities, and the social sciences.
- GE7.** Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written, and visual materials.
- GE8.** Students will demonstrate knowledge of principles of ethics and their employment in the analysis and resolution of moral problems.

Required Materials:

- 1) Benjamin A. Pierce. *Genetics Essentials: Concepts & Connections*. 2010. 2nd Ed. W.H. Freeman & Company. ISBN-13 # 978-1-4292-3040-7
- 2) Jung H. Choi & Mark E. McCallum. *Solutions & Problem-Solving Manual for Genetics Essentials: Concepts & Connections*. 2010. 1st Ed. W.H. Freeman & Company. ISBN-13 # 978-1-4292-4728-3
- 3) Response Card NXT Clicker (Turning Technologies), ISBN# 9781934931455

Additional Materials:

The Talking Glossary of Genetics @ the National Human Genome Research Institute (NIH):
<http://www.genome.gov/Glossary> Great resource for learning Genetic terms and definitions.

Graded Course Components: Your final grade will be based on your performance and participation on lecture exams, three homework problem sets, clicker based participation, and final exam (see grade calculation & distribution below). There are no make-up or late assignments accepted.

Three Lecture Exams & Final (each 25%, up to 75%): Students will be tested on their comprehension or application of **1) lecture/reading material, 2) listed textbook chapter: comprehension, application/challenge questions & “try problems”, and 3) assigned homework problem sets prior to each exam (below).** There are three Lecture Exams (25% each) & one cumulative Final Exam (25%). The lowest exam score will be dropped. All exams questions will pertain to the order of course material as it is presented chronologically. Questions will be in the form of Scantron but recorded through your student Clicker. Typical format includes multiple choices, true/false, and problem solving. Students must bring their student ID card, and must clearly write their name, student ID, and each chosen answer on their original exam copy. This exam copy must be returned to the instructors after each exam and serves as the final basis for exam grading if the Clicker should fail to work. If time allows, your instructor may provide post-exam reviews in lecture.

Homework Problem Sets (15%): Three homework problem sets will be posted on BlazeView and due prior to each respective Unit/Exam (1, 2, 3, etc.). Instructions and point values are included. It is the student's responsibility to download, print, complete and turn in each homework set in **LECTURE ONLY** (see schedule below). Students are encouraged to hand in homework sets early to the instructor or graduate assistant before the due date. However, late homework problem sets will not be accepted and recorded as zero.

Clicker Participation (10%): Clicker questions will be presented during lecture and scores posted on the course BlazeView Grade book. It is highly recommended you attend and participate to obtain this credit toward your final grade. There are no make-ups for clicker questions and any issues regarding the use and grade therein must be addressed to the graduate assistant. Please read and complete the *Clicker Student Use Acknowledgement* below.

Important Due Dates for Graded Course Components:

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|---------------------|--------------------|
| 1. Problem Set # 1 | September 11, 2014 |
| 2. Lecture Exam # 1 | September 23, 2014 |
| 3. Problem Set # 2 | October 16, 2014 |
| 4. Lecture Exam # 2 | October 23, 2014 |
| 5. Problem Set # 3 | November 13, 2014 |
| 6. Lecture Exam # 3 | December 02, 2014 |
| 7. Final Exam | December 10, 2014 |

Grade Calculation & Distribution: Final grades will be based on the cumulative of homework, clicker participation, and exams. **NOTE: the lowest EXAM grade will be removed from final calculation.** Therefore, the **final exam is optional**, if you are content with your overall score by the end of the semester, as the resulting zero on your final will be dropped as your lowest exam score.

Grade Calculation		Grade Distribution	
Category	Possible %	Letter	Percentage
Lecture Exam 1	25%*	A	89.5 – 100%
Lecture Exam 2	25%*	B	79.5 – 89.4%
Lecture Exam 3	25%*	C	69.5 – 79.4%
Final Exam	25%*	D	59.5 – 69.4%
Homework Sets 1-3	15%	F	≤ 59.4%
Clicker Participation	10%		
Total	100 %		

* Lowest Exam score dropped.

Notes on grading & studying: Students should note that a grade of "A" in this course represents an exemplary

command of the material covered. To obtain this grade of excellence, it is recommended that students study daily and answer all the chapter questions listed on the schedule below as "practice chapter questions". The concept summaries, important terms, comprehension, application, and occasional challenge questions found at the back of each text chapter are all helpful for study. Plus the required solutions and problem solving manual will help you learn how to solve genetics problems or concepts quickly. If you read the text, attend lecture, and do all the homework you should do well in this course. The instructor reserves the right to curve grades based on overall class performance at the end of the semester.

Mid-term & Attendance: Students will have at least one exam and one homework problem set completed to determine their overall grade by the Mid-Term and decide whether to withdraw at the deadline date (**10/02/2014**). Please note the university has a "5 W" policy in effect which limits a student's overall withdrawals to five during his/her undergraduate years. Individual exam and homework grades will be posted on the BlazeView course web-site so that students may compute their grade. However, this grade book is not the final used for computation of final grades for this course. University policy states >20% attendance will result in automatic failure. The student is responsible for all material missed regardless of the reason for absences. **ABSOLUTELY NO LECTURES, EXAMS, HOMEWORK PROBLEM SETS, OR CLICKER SESSIONS CAN BE "MADE UP."**

Student identification: Students should have in their possession at all times their VSU student identification card. In order to verify the identification of students officially enrolled in the course, it is the instructor's prerogative to request official student photo identification cards at any time during lecture or during exams.

Academic Dishonesty (e.g. cheating or plagiarism): A student cheating or plagiarizing will be penalized by receiving a zero for the assignment and will be reported to the dean of students. Refer to the Student Code of Ethics in the VSU Student Handbook.

Privacy Act (FERPA): The Family Educational Rights and Privacy Act (FERPA) prohibit the public posting of grades by Social security number or in any manner personally identifiable to the individual student. No grades can be given by email or over the telephone, as positive identification cannot be made by this manner.

Students with Disabilities: Students requesting classroom accommodations or modifications because of a documented disability must let me know and must also contact the Access Office for Students with Disabilities located in room 1115 Nevins Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

Student Clicker Use Acknowledgements:

1. I understand that for this course, I will use a Clicker where my responses and submission from this device plays an integral part in my class participation and grades in this course.
2. I understand that my responsibility for this course is to purchase a Clicker from the VSU Bookstore (The XR ResponseCard made by Turning Technologies) by the date specified by my instructor.
3. I understand that I must be present in class when The Clicker Orientation is given. The presenter(s) of this orientation shows students how to use Clickers for this course, and shows students where to find online guides and support information on the Clicker website. If I miss this orientation, I understand that I am responsible for reviewing the online orientation.
4. I understand that in order for me to receive my grades in BlazeVIEW, I must log into my course and submit my Clicker's Device ID number which is located on the back of my Clicker under the barcode. I must submit/register the Device ID Number by the date specified by my instructor.
5. If I lose my Clicker or have to replace it for any reason, I understand that I have to log into my course and submit this new Clicker's Device ID number. I then have to notify the instructor so that he/she can update the Clicker Participant list in order to receive grades from this new device.
6. I understand that I must periodically log into BlazeVIEW and check my grades after the Clicker Sessions. If I'm not receiving my grades, I must report this to the graduate assistant or instructor immediately.
7. I understand that my Instructor is not responsible for troubleshooting technical issues with my Clicker, so I must also report missing grades issues to the IT Helpdesk who will assist me and direct me to appropriate eLearning staff to resolve the issue. I understand that I should not allow missing grades to accumulate so I will continue to meet, correspond, and follow up with technical support until my issues are resolve and I am receiving Clicker grades.
8. I understand that using another student's Clicker with the intention of submitting responses and answers when they are not present in class is a violation of the Academic Honesty Policy at Valdosta State University.
9. I understand that sharing my Clicker with another student is not recommended, even if the other student has a different class at a different time.
10. **I have taken the in class Clicker Training & Knowledge Assessments Quiz (August 28, 2014).** This quiz counts as a course grade, it is required because of the importance of this technology and that the quiz serves as a means to reinforce understanding of what is required.

NOTE: Your first clicker grade will be to a) acknowledge you have obtained, b) verify you properly registered your clicker to this course, c) learn how to use your Clicker in this course, & 4) test your basic pre-Genetics knowledge & math skills.

TENTATIVE LECTURE & HOMEWORK OUTLINE:

Week:	Date:	Lecture Topics:	Text Chapter Readings:	Practice Chapter Questions:
1	Aug. 19 (T)	Course Introduction & Objectives	--	
	Aug. 21 (R)	Introduction to Genetics	1	1-22, 27
2	Aug. 26 (T)	Chromosomes & Cellular Reproduction	2	1-14, 17-20, 26, 27
	Aug. 28 (R)	Clicker Training & Knowledge Assessments	--	Have your Clicker Ready!
3	Sep. 02 (T)	Mendelian Transmission Genetics	3	1-15, 17-25, 27-35
	Sep. 04 (R)	Continued	--	
4	Sep. 09 (T)	Human Genetics & Counseling	--	Guest Speaker
	Sep. 11 (R)	Extensions & Modifications of Mendelian Genetics	4	1-19, 21-23, 25-35 Problem Set 1 Due
5	Sep. 16 (T)	Continued	--	
	Sep. 18 (R)	Catch-up & Review	--	
6	Sep. 23 (T)	Lecture Exam 1	--	
	Sep. 25 (R)	Gene Linkage, Recombination, & Mapping on Chromosomes	5	1-13, 15, 20-24
7	Sep. 30 (T)	Continued	--	
	Oct. 02 (R)	DNA & Chromosomal Structure	8	1-22, 24, 25, 33
	Oct. 02 (R)	Midterm- last day to drop	--	
8	Oct. 07 (T)	Continued	--	
	Oct. 09 (R)	DNA Replication	9.1 & 9.2	1-6, 15-17, 20
9	Oct. 14 (T)	RNA Transcription	10.1 → 10.3	1-25, 28-30
	Oct. 16 (R)	Protein Translation → Genetic Code	11.1 & 11.2	1-9, 12-18, 22, 23 Problem Set 2 Due
10	Oct. 21 (T)	Catch-up & Review	--	
	Oct. 23 (R)	Lecture Exam 2	--	
11	Oct. 28 (T)	Gene Regulation in Prokaryotes vs. Eukaryotes	12.1 → 12.4 (Pgs. 289-308)	1-10, 18, 21, 22
	Oct. 30 (R)	Continued	--	
12	Nov. 04 (T)	Gene Mutations & Transposons	13.1 → 13.3	1-3, 5-11, 13-15, 17, 20, 23
	Nov. 06 (R)	Biotechnology & Genomics	14	TBD
13	Nov. 11 (T)	Continued	--	
	Nov. 13 (R)	Quantitative Genetics	17.1 → 17.3	1-4, 11, 12 Problem Set 3 Due
14	Nov. 18 (T)	Population Genetics	18.1 & 18.2	1-4, 23, 25, 27
	Nov. 20 (R)	Catch-up & Review	--	
--	Nov. 25 (T)	Thanksgiving Break- NO CLASS	--	
	Nov. 27 (R)	Thanksgiving Break- NO CLASS	--	
15	Dec. 02 (T)	Lecture Exam 3	--	
	Dec. 04 (R)	Final Exam Review	--	
16	Dec. 10 (W)	Final Exam	--	2:45 – 4:45 PM (BC 1011)