

BIOL 3200, Introductory Genetics
Fall Semester 2016, Section A (CRN# 81273, 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: **M & T** 4:00 p.m. – 5:00 p.m.
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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*. 2016. 3rd Ed. W.H. Freeman & Company. ISBN-13 # 978-1-4641-9075-9
- 2) Jung H. Choi & Mark E. McCallum. *Solutions & Problem-Solving Manual for Genetics Essentials: Concepts & Connections*. 2016. 3rd Ed. W.H. Freeman & Company. ISBN-13 # 978-1-3190-2046-0

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, online quizzes, 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. 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 record for exam grading. 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.

BlazeView Quizzes (10%): Quiz questions related to topics covered in lecture are posted each week on the course BlazeView website from Sunday to Sunday (see schedule below). Please read the material and attempt the quiz up to three times prior to joining me in lecture.

Important Due Dates for Graded Course Components:

- | | |
|---------------------|--------------------|
| 1. Problem Set # 1 | September 08, 2016 |
| 2. Lecture Exam # 1 | September 20, 2016 |
| 3. Problem Set # 2 | October 13, 2016 |
| 4. Lecture Exam # 2 | October 25, 2016 |
| 5. Problem Set # 3 | November 10, 2016 |
| 6. Lecture Exam # 3 | December 01, 2016 |
| 7. Final Exam | December 07, 2016 |

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%
BlazeView Quizzes	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 (**10/06/2016**). 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 QUIZZES 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. By taking this course, you agree that all required course work may be subject to submission for textual similarity review to Turnitin, a tool within BlazeVIEW. For more information on the use of Turnitin at VSU see Turnitin for Students.

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 with disabilities who are experiencing barriers in this course may contact the Access Office for assistance in determining and implementing reasonable accommodations. The access Office is located in Farbar Hall. The phone numbers are 229-245-2498 (V), 229-375-5871 (VP) and 229-219-1348 (TTY). For more information, please visit VSU's Access Office or email: access@valdosta.edu.

Title IX Statement: Valdosta State University (VSU) is committed to creating a diverse and inclusive work and learning environment free from discrimination and harassment. VSU is dedicated to creating an environment where all campus community members feel valued, respected, and included. Valdosta State University prohibits discrimination on the basis of race, color, ethnicity, national origin, sex (including sexual harassment and sexual violence), sexual orientation, gender identity, religion, age, disability, genetic information, or veteran status, in the University's programs and activities as required by applicable laws and regulations such as Title IX. The individual designated with responsibility for coordination of compliance efforts and receipt of inquiries concerning nondiscrimination policies is the University's Title IX Coordinator: the Director of the Office of Social Equity, titleix@valdosta.edu, 1208 N. Patterson St., Valdosta State University, Valdosta, Georgia 31698, 229-333-5463.

TENTATIVE LECTURE & HOMEWORK OUTLINE:

Week:	Date:	Lecture Topics:	Text Chapter Readings:	Practice Chapter Questions:
1	Aug. 16 (T)	Course Introduction & Objectives	--	
	Aug. 18 (R)	Prior Knowledge Assessment	--	TBA (in class)
2	Aug. 23 (T)	Introduction to Genetics, Historical & Societal Perspectives	1	1-23, 29
	Aug. 25 (R)	Chromosomes & Cellular Reproduction	2	1-14,17-20,25-27,31
3	Aug. 30 (T)	Mendelian Transmission Genetics	3	1-18, 20-32, 37-41
	Sep. 01 (R)	Continued	--	
4	Sep. 06 (T)	Human Genetics & Counseling	--	TBA (in class)
	Sep. 08 (R)	Extensions & Modifications of Mendelian Genetics	4	1-19, 21-23, 25-35 Problem Set 1 Due
5	Sep. 13 (T)	Continued	--	
	Sep. 15 (R)	Catch-up & Review	--	
6	Sep. 20 (T)	Lecture Exam 1	--	
	Sep. 22 (R)	Gene Linkage, Recombination, & Mapping on Chromosomes	5.1 → 5.3	1-15, 20-24; 26 (for fun!)
7	Sep. 27 (T)	Continued	--	
	Sep. 29 (R)	DNA & Chromosomal Structure	8	1-22, 24-25, 27-29,34
8	Oct. 04 (T)	Continued	--	
	Oct. 06 (R)	DNA Replication Midterm- last day to drop	9.1 & 9.2 Plus 253-254	1-6, 16-18, 21-22
9	Oct. 11 (T)	Fall Break- NO CLASS		
	Oct. 13 (R)	RNA Transcription	10.1 → 10.3	1-26, 15-26 Problem Set 2 Due
10	Oct. 18 (T)	Protein Translation → Genetic Code	11.1 & 11.2 Plus pg. 304	1-9, 12-20, 22-23
	Oct. 20 (R)	Catch-up & Review	--	
11	Oct. 25 (T)	Lecture Exam 2	--	
	Oct. 27 (R)	Gene Regulation in Prokaryotes vs. Eukaryotes	12.1 → 12.4 (Pgs. 307-327)	1-10, 21-26
12	Nov. 01 (T)	Continued		
	Nov. 03 (R)	Gene Mutations & Transposons	13.1 → 13.3	1-3, 5-11, 17-20, 25-26
13	Nov. 08 (T)	Continued	--	
	Nov. 10 (R)	Genomics	15.1 → 15.3	TBD Problem Set 3 Due
14	Nov. 15 (T)	Quantitative Genetics	17.1 → 17.3	1-6, 11-12, 20, 22
	Nov. 17 (R)	Population Genetics	18.1 & 18.2	1-4, 23, 25-27
--	Nov. 22 (T)	Catch-up & Review	--	
	Nov. 24 (R)	Thanksgiving Break- NO CLASS	--	
15	Dec. 01 (T)	Lecture Exam 3	--	
	Dec. 03 (R)	Final Exam Review	--	
16	Dec. 07 (W)	Final Exam	--	2:45 – 4:45 PM (BC 1011)