

BIOL 3200, Introductory Genetics
Spring Semester 2020, Section A (CRN# 21979, 3 Credit hours)
Department of Biology, College of Science & Math, Valdosta State University

Lecture (BC 1023): T & R 3:30 p.m. – 4:45 p.m.

Instructor: Dr. Brian C. Ring
Office: **BC 2084**
Office hours: **M & W 4:00 p.m. – 5:30 p.m.**
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Pre-Requisites: MATH 1112 or 1113, BIOL 1107 & 1107L, and 1108 & 1108L 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:

Benjamin A. Pierce. *Genetics Essentials: Concepts & Connections*. 2018. 4th Ed. W.H. Freeman & Company. ISBN-13 # 978-1-319-10722-2

Optional Materials:

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. **Note:** Some problems are provided solutions in the back of the main text. This solutions manual describes how to solve all assigned practice problems in great detail so is recommended.

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.
A common genetics vocabulary list provided on Blazeview by your instructor.

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 choice, true/false, and problem solving. Students must bring their student ID card, and must clearly write their name, student ID, given ID number (TBA in class), 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.) so that I can grade and review. 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 (if available) 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 across 10 quizzes (each 1% overall grade). Quizzes are open from Start of Semester to scheduled lecture date at 3:30 pm **BEFORE** I cover the chapter topics (see schedule below & BlazeView course site calendar). Therefore, please read the material and attempt the quiz up to three times prior to joining me for lecture. No extensions or make-up quizzes are allowed.

Important Due Dates for Graded Course Components:

- | | |
|---------------------|-------------------|
| 1. Problem Set # 1 | February 06, 2020 |
| 2. Lecture Exam # 1 | February 13, 2020 |
| 3. Problem Set # 2 | March 05, 2020 |
| 4. Lecture Exam # 2 | March 24, 2020 |
| 5. Problem Set # 3 | April 14, 2020 |
| 6. Lecture Exam # 3 | April 28, 2020 |
| 7. Final Exam | May 08, 2020 |

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 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 quizzes and at least one exam and homework problem set completed to determine their overall grade by the Mid-Term (**03/6/2020**) and decide whether to withdraw at the deadline date (**03/12/2020**). 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 <https://www.valdosta.edu/student/disability/welcome.php> 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.

Campus Gun Carry Statement (HB 280): If you choose to carry a concealed weapon on campus (e.g. lecture hall), you are responsible for knowing and following the law. Refer here for FAQ: <https://www.valdosta.edu/administration/finance-admin/police/campuscarry/>

SOI Statement: At the end of the term, all students will be expected to complete an online Student Opinion of Instruction survey (SOI) that will be available through SmartEvals. Students will receive an email notification through their VSU email address when the SOI is available (generally at least one week before the end of the term). SOI responses are anonymous to instructors/administrators, and they will be able to access results only after they have submitted final grades. Before final grade submission, instructors will not be able to see any responses, but they can see the percentage of students who have or have not completed their SOIs. While instructors will not be able to see student names, an automated system will send a reminder email to those who have yet to complete their SOIs. Students who withdraw or drop a course will also be sent invitations to complete the Dropped Course Survey. Complete information about the SOIs, including how to access the survey, is available on the SOI Procedures webpage.

TENTATIVE LECTURE & HOMEWORK OUTLINE:

Week:	Date:	Lecture Topics:	Readings & Quiz (Q1-10):	Practice Chapter Questions:
1	Jan. 14 (T)	Course Introduction & Objectives	--	TBA (in class)
	Jan. 16 (R)	Prior Knowledge Assessment	--	
2	Jan. 20 (T)	Introduction to Genetics, Historical & Societal Perspectives	1	1-23, 29
	Jan. 23 (R)	Chromosomes & Cellular Reproduction	2, Q1	1-14,17-20,25-27,31
3	Jan. 28 (T)	Mendelian Transmission Genetics	3, Q2	1-18, 20-32, 37-41
	Jan. 30 (R)	Continued	--	
4	Feb. 04 (T)	Extensions & Modifications of Mendelian Genetics	4, Q3	1-19, 21-23, 25-35
	Feb. 06 (R)	Continued	--	Problem Set 1 Due
5	Feb. 11 (T)	Catch-up & Review	--	
	Feb. 13 (R)	Lecture Exam 1	--	
6	Feb. 18 (T)	Gene Linkage, Recombination, & Mapping on Chromosomes	5.1 → 5.3, Q4	1-15, 20-24; 26 (for fun!)
	Feb. 20 (R)	Continued	--	
7	Feb. 25 (T)	DNA & Chromosomal Structure	8	1-22, 24-25, 27-29,34
	Feb. 27 (R)	Continued	--	
8	Mar. 03 (T)	DNA Replication	9.1 & 9.2, Q5 Plus 253-254	1-6, 16-18, 21-22
	Mar. 05 (R) 3/5/2020	RNA Transcription Midterm- last day to drop 3/12/2020	10.1 → 10.3 Q6	1-26, 15-26 Problem Set 2 Due
9	Mar. 10 (T)	Protein Translation → Genetic Code	11.1 & 11.2, Q7 Plus pg. 304	1-9, 12-20, 22-23
	Mar. 12 (R)	Catch-up & Review	--	
10	Mar. 17 (T)	Spring Break- NO CLASS	--	
	Mar. 19 (R)	Spring Break- NO CLASS	--	
11	Mar. 24 (T)	Lecture Exam 2	--	
	Mar. 26 (R)	Gene Regulation in Prokaryotes vs. Eukaryotes	12.1 → 12.4, Q8 (Pgs. 307-327)	1-10, 21-26
12	Mar. 31 (T)	Continued	--	
	Apr. 02 (R)	Gene Mutations & Transposons	13.1 → 13.3	1-3, 5-11, 17-20, 25-26
13	Apr. 07 (T)	Continued	--	
	Apr. 09 (R)	Quantitative Genetics	17.1 → 17.3 Q9	1-6, 11-12, 20, 22
14	Apr. 14 (T)	Continued	--	
	Apr. 16 (R)	Population Genetics	18.1 & 18.2, Q10	1-4, 23, 25-27 Problem Set 3 Due
15	Apr. 21 (T)	Human Population Genetics	--	TBA (in class)
	Apr. 23 (R)	Catch-up & Review	--	
16	Apr. 28 (T)	Lecture Exam 3	--	
	Apr. 30 (R)	Final Exam Review	--	
17	May 08 (Friday)	Final Exam	--	2:45 – 4:45 PM (BC 1023)

