

General Biology 2106

Spring 2016

Instructors:

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Dr. Russell Gardner, 122A Mendel Hall; Office phone, Russell.gardner@villanova.edu; Office phone, X96621; Office hours Monday and Wednesday 4-5 and Thursday from 3-4 (or by appointment).

Lab Coordinator:

Ms. Emily Whitfield, 193A or 184 Mendel Hall; emily.whitfield@villanova.edu

Texts:

- Campbell, N.A., et al., 2015. *Biology, Tenth* Edition. Benjamin/Cummings, New York.
 - Villanova University, Spring 2016. *General Biology II Lab Manual*, McGraw-Hill Custom Publ.
 - Turning Point Response Card (Clicker)- RF
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Welcome! We are glad to have you in our class this semester, and look forward to working with you! In this course, we will provide you with information that is foundational to the complex and exciting field of modern biology. We will discuss cutting-edge research and explore complex systems, from the human immune system to vast tropical forests. We aim to teach you how to synthesize and apply this knowledge and (especially in lab) to learn to observe causal relationships in biology. A strong foundation in biology will provide you with the ability to advance to upper level courses and to proficiently interpret how science is intricately related to societal issues.

In this syllabus you will find the lecture and lab schedules as well as the course policies and information. If you have ANY questions or concerns at all at any time during the semester, please do not hesitate to ask us – we are here to help you! We hope you have an enjoyable and interesting semester and learn a lot about biology!

GRADING

There is a single grade for the combined lecture/laboratory portions of the course. Letter grades for the course are based on the number of points accumulated during the semester. Lecture examinations contribute 60% of the grade, laboratory assignments contribute 40%, as summarized in the table below. In addition to the laboratory project report and the experimental design/statistics assignment (which is mandatory) you will complete two in-lab worksheets and choose 3 of 4 lab assignments. **It is important for you to keep track of how many assignments you have done and it is your responsibility to ensure you complete all assignments by their due date.**

Component	Points
Exams: 4 @ 120 points each	480
Final Exam, part new, part comprehensive material	120
Laboratory written assignments: 4 @ 50 points each	200
Laboratory in-class worksheets: 2 @ 25 points each	50
Laboratory Project: 150 point	150
Total	1000

Though the actual grading scale will be determined at the end of the semester, students will be updated on their performance after each exam and of their standings at midterms.

Lecture Examinations

Lecture examinations will be based on material covered in lecture and reading assignments, and complemented by material covered in laboratory sessions. The exams will draw mainly on lecture content, although exams may include material not specifically discussed in lecture, but covered in assigned book chapters and/or occasional outside readings. We will follow the same format for exams throughout the semester.

Exams will be graded and returned no later than one week after they are administered. When we return graded exams, please compare your answers to the exam keys, and add up your score. If you feel that an error was made in grading, please bring it to the attention of the professors within a week of the keys being posted.

Clickers

We will use Turning Point clickers throughout this course. These tools allow us to: 1) assess your understanding of the course material; 2) provide you with practice questions for the exams. Please have your Turning Point clicker (response card RF) by the second week of class.

ATTENDANCE POLICIES

Lecture Attendance

“Class and laboratory attendance for first year students is mandatory. A first-year student will receive a grade of “Y” (failure) whenever the number of unexcused absences in a course exceeds twice the number of weekly class meetings for the course

(<http://www1.villanova.edu/villanova/vpaa/studentervices/policies/attendance.html>).”

We expect students beyond the first year to attend lectures. Class attendance will be monitored via clicker questions and will be checked occasionally by TA’s. Students are required to attend the lecture session in which they are registered and are expected to comply with attendance taking policies. We will record all lectures and make them available for viewing after lecture.

All students are required to be present for scheduled examinations, except in the event of serious illness or other excused absence. Make up examinations will be scheduled in light of the excused absence, on a case-by-case basis. Students who miss scheduled examinations without an excused absence will receive a failing grade for that examination.

Laboratory Attendance

“Class and laboratory attendance for first year students is mandatory. A first-year student will receive a grade of “Y” (failure) whenever the number of unexcused absences in a course exceeds twice the number of weekly class meetings for the course

(<http://www1.villanova.edu/villanova/vpaa/studentervices/policies/attendance.html>).” For students beyond their first year, attendance in laboratory is mandatory, as well. ***Any unexcused absence will result in 50 points being deducted from a student’s total accumulated points at the end of the semester.***

If you know that you will have to miss a lab because of serious illness or if you need to request an excused absence, contact Ms. Whitfield as soon as possible to make appropriate arrangements. In general, we will try to accommodate you in a different laboratory section *during the same week of your excused absence*. Keep in mind that due to the fullness of the lab sections, it is not guaranteed that we will be able to fit you into another lab (although we'll do our best!). Unexcused absences will be handled on a case-by-case basis. Make-ups of another week's labs are almost never possible, and we have no labs on Friday.

Severe Weather Note: In the event of lab delay, still report to lab for the remaining amount of time left in the laboratory session (so for example, if you have an 8:30 AM lab but classes are delayed until 10:30 AM, please still come to the remainder of your lab at 10:30 AM). In the event of lab cancellation due to inclement weather, lab make ups will be scheduled for that Friday afternoon – Ms. Whitfield will contact you to make arrangements.

LABORATORY POLICIES

Bring your Lab Manual and a writing implement with you to each lab. For certain labs, you will be required to bring your laptop – we will let you know which labs. It may be helpful for you to print out the lab PowerPoint (3 slides to a page in handout format) to bring as well – all lab PowerPoints will be available on Blackboard no later than the Sunday before the lab week.

Laboratory Safety

- 1) No food or drink in the lab (this includes water and gum!) – this is very strictly enforced!
- 2) Cell phones:
 - a. While in lab, cell phones must have the ringer turned off, and during the pre-lab lecture it should be put away (in your bag or your pocket).
 - b. Lab time is for exactly that – lab activities, NOT for texting or talking on the phone (even if you leave the room). If you are texting or talking on your cell phone during lab, it can be distracting to your classmates. Your TA has the authority to confiscate your phone if necessary, returning it to you at the end of the lab period.
- 3) Wear clothing appropriate for lab any time you are in the lab room. These policies are for your safety:
 - Pants or skirts must fully cover the legs to at least your ankle when SITTING to protect against spills. (Students may opt to bring a pair of pants to wear over shorts or with short skirts.)
 - Appropriate foot wear is required in lab at all times, e.g., no sandals, flip-flops or other open toed foot wear that leave your feet exposed.
 - No bare or stocking feet allowed.
 - No sleeveless tops.
 - No “belly shirts” or low-rise pants or any other type of clothing that exposes the midriff area. Shirts must be either tucked in or have an adequate overlap with your pants.
 - Long hair should be tied back or otherwise confined when working with preserved specimens or chemicals.
 - Some labs require safety goggles, gloves, and lab aprons or lab coats – you MUST wear them when required. While we will provide these, you are also welcome to bring your own.
 - If you arrive to lab dressed inappropriately, you will not be allowed to participate until you go home and change. The dress code is required ANY time you will be in the laboratory room itself, regardless of what we are doing in lab.
 - You are welcome to bring pants and shoes to change into outside of lab if you do not wish to wear those clothes all day, and/or you may store clothes in the lab if you wish, as well (ask your TA for more info if you wish to do this).

- 5) If you break anything (slide, glassware, instrumentation), please inform your TA so that we can order a replacement as soon as possible (at no charge to you, and you won't be in trouble, don't worry). Place any broken glass into the broken glass disposal box.
- 6) Leave the lab cleaner than you found it!!
 - Return all equipment and materials to their proper places when you are finished.
 - Any biohazardous waste should be placed in biohazard waste containers
 - Straighten up your lab bench area (which includes wiping it down with disinfectant if necessary).
 - Wash your hands before leaving the lab, and please *please* push in your chairs.
- 7) Emergencies:
 - Know where the emergency exits and evacuation routes are.
 - In case of fire, evacuate the lab immediately and pull the fire alarm.
 - Know the location and proper use of fire extinguishers, eyewash stations, and safety showers.
 - Notify your TA immediately of any injuries or other accidents, no matter how small. Know where the nearest first aid kit is located.

Animals in the Lab

Many people, including students and professional biologists, share a concern for the use to which animals are put in the context of teaching. In this course it will be necessary to carry out several exercises that make use of preserved or living animals. Such use of animals in teaching is an integral part of the biology experience and as such has been designed to fit in with the overall aims and goals of the course. For this reason, students will not be excused from participating in those laboratories involving the study of living or preserved animals, and will be required to sign an Animal Use Policy Statement verifying that you are aware of and agree to these policies. If you object to these types of exercises please see the Chairman of the Biology Department to discuss your concerns.

You will be required to perform observations and dissections on preserved specimens. Some of these animals may have been collected during the course of scientific or educational field work. In this case these specimens will have been obtained legally and their method of sacrifice and preservation will have been in accordance with ethical policies of appropriate institutional governing bodies and any applicable local, state, or federal guidelines. Other preserved animals have been obtained from reputable supply houses that follow regulated guidelines for the humane sacrifice and preparation of the animals. You will also be required to perform observations on and do non-harmful experiments with living animals as well. These organisms are cared for in the lab following regulated guidelines, and when you are working with them we expect you to be careful with these organisms and to not harm or overly stress them. Although some may regard certain organisms (such as mammals) as being more "important" or more worthy of protection than others, all living organisms have intrinsic value and they should be treated accordingly. In this lab we recognize and respect the value of all living things, and require you to show that same respect and care when working with any living or preserved animals.

The primary reason for using animals in the lab is related to their value in experiential learning. The structure and function the animal body, including tissues, organs and systems of organs within animal bodies, are extremely complex. Without the first-hand experience of observing, locating and manipulating these structures within the three-dimensional framework of the real organism it is impossible to appreciate fully the complexities of animal form and function. Since attaining knowledge of the way in which animals "work" is one of goals of the laboratory, your instructors believe that the use of preserved and/or living specimens is imperative to your learning and appreciating the material dealt with in this course. Diagrams and other materials are also used in the course and are useful adjuncts to real animals, but they cannot substitute for them. By analogy, someone can tell you the rules of chess or baseball, but without the

experience of watching a game, the rules are abstract concepts and without playing yourself it is difficult to appreciate the game or truly to understand its intricacies.

ACADEMIC ACCOMMODATIONS

It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with learning disabilities. If you are a person with a disability and wish to request accommodations to complete your course requirements, please make an appointment with the course professor as soon as possible to discuss the request. If you would like information on documentation requirements, contact the Office of Learning Support Services at 610-519-5636, visit the office on the 2nd floor of Kennedy Hall, or visit the webpage: www.learningsupportservices.villanova.edu

The Office of Disability Services collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The ODS provides Villanova University students with *physical disabilities* the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact *Gregory Hannah, advisor to students with disabilities @* 610-519-3209 or visit the office on the second floor of the Connelly Center.

ACADEMIC INTEGRITY

Students are expected to know and comply with all University policies related to academic dishonesty and plagiarism. The Villanova University Code of Academic Integrity is available at the following web site: www.vpaa.villanova.edu/academicintegrity. SafeAssign will be used for all assignments in lab as well – this program checks your assignment against all other assignments in the class, against all assignments from previous years, and against everything on the web.

OTHER COURSE INFORMATION

We often send out announcements and reminders via Villanova email, and post many class materials on Blackboard – you are required to check your Villanova email and Blackboard on a regular basis for these items. We will not send emails to any non-VU address, so if you use another email server, you are responsible for setting up your VU email so that it forwards all email to your other account.

Help Available

We've arranged for a variety of ways for you to get help learning the material; we encourage you to use as many of these as you like. First, we will have all 12:30 lectures recorded and synced with power point slides. We will also have review sessions prior to each exam. During these review sessions we will go over practice exam questions that have you received via clicker questions asked in class. Also, free tutoring sessions will be scheduled each week and the night before each exam to answer any questions that may arise – the days and times will be announced. You may arrive/leave at any during the tutoring session (so don't worry about being late or having to leave early), and you are encouraged to attend regularly. Don't put off studying and getting your questions answered until the last few hours before an examination. Your teaching assistant is an additional key resource for you. He or she is the best place to start for help with laboratory material, and will also be helpful if you have questions about lecture material. The teaching assistants are also good pipelines to the course instructors; we meet with each other weekly.

LECTURE SCHEDULE – BIO 2106 – SPRING 2016

Day	Date	Chapter	Topic	Lecturer
M	11 Jan		Course Overview	SC/VI/RG
W	13 Jan	26-27	Diversity Bridge – Bacteria	SC
F	15 Jan	27-28	Protists	SC
<i>M</i>	<i>18 Jan</i>		<i>Martin Luther King Day (no classes)</i>	
W	20 Jan	28 & 31	Protists and Fungi	SC
F	22 Jan	31	Fungi	SC
M	25 Jan	29	Plant Diversity I: Nonflowering plants	SC
W	27 Jan	29	Plant Diversity I: Nonflowering plants	SC
F	29 Jan	30	Plant Diversity II: Flowering plants	SC
M	1 Feb	36	Transport in Plants I	SC
W	3 Feb		EXAM 1 (through Plant Diversity)	
F	5 Feb	36	Transport in Plants II	SC
M	8 Feb	35	Plant Structure/Growth I	SC
W	10 Feb	35	Plant Structure/Growth II	SC
F	12 Feb	37	Plant Nutrition I	SC
M	15 Feb		Experimental design and research	SC
W	17 Feb	37	Plant Nutrition II	SC
F	19 Feb	39	Plant Control Systems	SC
M	22 Feb	32	Animals - Overview	VI
W	24 Feb		EXAM 2 (through Plant Control Systems)	
F	26 Feb	33	Invertebrates I	VI
<i>M</i>	<i>29 Feb</i>		<i>Spring Break - Classes resume 7 March</i>	
M	7 Mar	33	Invertebrates II	VI
W	9 Mar	34	Vertebrates I	VI
F	11 Mar	34	Vertebrates II	VI
M	14 Mar	51	Animal Behavior I	VI
W	16 Mar	51	Animal Behavior II	VI
F	18 Mar	40	Animal Form and Function	VI
M	21 Mar		EXAM 3 (through Animal Form and Function)	
W	23 Mar	41	Animal Nutrition/Digestion I	RG
F/M	25-28 Mar		<i>Easter Break - Classes resume 29 March</i>	
W	30 Mar	41	Animal Nutrition/Digestion II	RG
F	1 Apr	42	Circulation & Gas Exchange I	RG
M	4 Apr	42	Circulation & Gas Exchange II	RG
W	6 Apr	44	Osmoregulation & Excretion I	RG
F	8 Apr	44	Osmoregulation & Excretion II	RG
M	11 Apr	43	The Immune System	RG
W	13 Apr	45	Hormones and the Endocrine System	RG
F	15 Apr	48-49	The Nervous System	RG
M	18 Apr	52	Introduction to Ecology	VI
W	20 Apr	53	Population Ecology	VI
F	22 Apr		EXAM 4 (through Sensory/Motor Mechanisms)	
M	25 Apr	54	Community Ecology	VI
T	26 Apr	55	Ecosystems Ecology	SC
W	27 Apr	56	Global Change	SC
F	29 Apr		Reading Day	
R	5 May		FINAL EXAM 11:30AM- 2:00PM	

LABORATORY SCHEDULE – BIO 2106 – SPRING 2016

Week of	Lab #	Lab Topic	Lab Manual Pages	Lab Writeup due date
11 Jan	1	Introduction		
18 Jan	2	Protists, Fungal Diversity and Enzymes - Monday section will be scheduled into other labs	pg. 1-32 & handouts	Lab writeup due week of Feb 1
25 Jan	3	Seed Plant diversity & Leaf Photosynthesis	pg. 33-63 & Handout	Lab writeup due week of Feb 8
1 Feb	4	Plant Water Potential, Diversity Index, and Excel workshop	Handout	Lab writeup due week of Feb 15
8 Feb	5	Room 180: Animal Respiration Room 188: Experimental Design, Statistics and Primary Literature	Handouts	Lab writeup due week of Feb 22
15 Feb	6	Room 180: Experimental Design, Statistics and Primary Literature Room 188: Animal Respiration	Handouts	Lab writeup due week of Mar 7
22 Feb	7	Group Experiments I – Experimental Design and Preparation	Handout	Final protocol due to Ms. Whitfield by 2/26
Feb 29 – March 4 SPRING BREAK – no labs				
7 Mar	8	Animal Diversity (invertebrates and vertebrates)	pg. 65-144	Worksheet due at end of lab
14 Mar	9	Group Experiments II - Carrying out the experiments		
21 Mar	10	Group Experiments II - Carrying out the experiments		
28 Mar		NO LABS Labs open by appt. this week for group experiments		
4 Apr	11	Aspects of Human Physiology	pg. 145-162 & Handout	Worksheet due at end of lab
11 Apr	12	Ecology Field Trip – Ridley Creek State Park • Field trip will take place, rain or shine, during regular lab hours. • Wear appropriate clothes to work in woods/dirt and good walking shoes Labs open by appt. this week for group experiments	Handout	Field trip data/results will be assessed on the final examination
SAT 16 Apr @ 9:00am	BONUS (10 pts)	Plant Diversity Field Trip - Longwood Gardens: • All lab sections may participate in the SATURDAY, April 16 field trip - Depart from Mendel Hall parking lot at 9:00am • To receive credit, you must inform Ms. Whitfield by Thursday, March 31 if you intend to go. Bonus points given to all who attend and do the lab exercise • Wear good walking shoes & bring a camera (camera on phone is fine).	Handout	Lab exercise due Monday, April 25
18 Apr	13	Group experiment III - Presentations		
25 Apr		NO LABS		Project write-up due this week