

BIOL 1107K, Principles of Biology I **Spring Semester, 2012 Sections D, E, F**

Lecture (BC 1023): TR 9:30 a.m. - 10:45 a.m.
Laboratory (BC 1083): Section D (CRN 21332): Wed.: 9:00 a.m. – 11:50 a.m.
Section E (CRN 21333): Wed.: 1:00 p.m. – 3:50 p.m.
Section F (CRN 21334): Thurs.: 12:00 m. - 2:50 p.m.

Instructor: Dr. Russ Goddard, BC 2090. (Phone 249-2642; or Dept. office 333-5759)
(Office hours: T 11:00 a.m. – 12:30 p.m.; R 11:00 a.m. – 11:50 p.m.; or by appt.)
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Course Catalog Description: BIOL 1107 Principles of Biology I; 3-3-4; Co-requisite for biology majors: BIOL 1100.
An introduction to the principles of biology for science majors, with an emphasis on the cellular nature of life. Concepts covered include the origin and early evolution of cellular life; cell structure, function, metabolism, and reproduction; cell signaling; and gene regulation in bacteria and eukaryotes.

Required Materials:

Text: Sadava, D., D.M. Hillis, H.C. Heller, and M.R. Berenbaum. 2011. Life: The Science of Biology. 9th edition. Sinauer Associates Inc., Sunderland, MA and W.H. Freeman & Co. Gordonsville, VA.

Laboratory Manual: Goddard, R.H. 2011. Methods and Investigations in Basic Biology, 5th ed. Hayden-McNeil Publishing, Plymouth, MI.

“Clickers”: Each student is required to obtain a Turning Technologies NXT clicker (available in the bookstore). All students are responsible for having their clickers with them in class. All points accumulated in lecture are generated by clickers. If you do not bring your clicker, no points will be recorded for your participation ☹. Clicker info at: <http://www.valdosta.edu/distance/clickers/index.shtml>.

Additional Course Materials on the WWW: <http://www.valdosta.edu/~rgoddard/> or the BlazeView Course Page.

General Objectives: This course provides an introduction to basic principles of biology. Information presented in this class includes an emphasis on topics encompassing cell structure and function, metabolism, cell reproduction, gene structure and function, genetics, and evolution as unifying principles of all life. The goal of this course is to stimulate student learning of these basic concepts and to encourage contemplation of the significance of each concept to the general concept of biology. Specific course learning objectives addressed in this course that are aligned with Department and University learning objectives (listed at the end of this syllabus) include BIOL objectives 1 through 5 and VSU objectives 3-5 and 7-8. Additionally, as aligned with our new core curriculum (<http://www.valdosta.edu/academic/VSUCore.shtml>), students will demonstrate understanding of the physical universe and the nature of science, and they will use scientific methods and/or mathematical reasoning and concepts to solve problems.

Attendance: Attendance in this course absolutely is required. Students should be seated at the beginning of class. If you are late, your attendance may not be acknowledged. Additionally, anyone arriving late could miss points from clicker or quiz questions (no make-ups!). The student is responsible for all material missed regardless of the reason for absences. **ABSOLUTELY NO LECTURES OR LABORATORIES CAN BE "MADE UP."** Laboratories in particular are important not to miss. In the event that a student will miss a class, s/he should notify the instructor in writing by email BEFORE the missed class. The student will miss any points assessed during the assessed class. It will not be possible to arrange make-up assignments for lab or lecture points missed but any attendance penalties may be excused.

Graded Course Components: Your final grade will be based on your performance in the following course components: Additional unannounced in-class assignments may count toward the final grade during the semester.

Lecture: (400 pts): There will be 3 lecture exams and a mandatory comprehensive final exam given on the dates listed below. Students are required to know the lecture material and the readings from the text for exams and quizzes. Information presented in the laboratory may also be included in these exams. Each exam is 100 pts. Clicker response systems are necessary for exams.

Lecture “Clicker” grade: (100 pts). During this course the instructor will be using “clicker” technology to better

engage students in the learning process and to facilitate rapid feedback for exams. For each clicker question presented in lecture, a point value will be assigned. Clicker questions will, or can, be presented throughout the lecture class period. Occasionally, longer lecture quizzes will be given using clicker input. All responses to questions presented during lecture will be compiled at the end of the course. The grade for this component will be the number of questions answered correctly divided by the number of points available times 100. The final computed clicker grade is the only grade that might be significantly scaled to adjust for overall class performance! For any absence, clicker points can never be made up and all points will count for all students.

Due to the size of this class, any student without a "clicker" will not have their responses recorded and there is no way to circumvent this. It is the student's responsibility to bring their working clicker with them to every lecture to insure that their points are recorded. Due to the nature of the "instantaneous" response with this method, there are no alternatives to collecting clicker points. If you do not have your clicker, if your battery is dead, or you are prevented in any way from using your clicker, your clicker points for that day will not be recorded.

Dropped grade: The lowest score you receive among either the three lecture exams or the combined lecture clicker grade will be excluded (dropped) and will not be used for computing your final grade. Therefore, although there are 400 possible points from lecture exams and pop-quizzes (excluding the final), only 300 of those points will count toward your final grade. **The final exam (100 pts) is mandatory.**

Laboratory: (100 pts) Students will be graded on their performance in laboratory based on attendance, weekly quiz grades, selected homework assignments, group lab projects, and other miscellaneous assignments. As the laboratory is considered an extremely important part to learning "hands-on" biology, any student will automatically lose points (14 labs in course) from their final lab grade for any absence from laboratory.

Final grades will be based on a percentage of your cumulative points relative to the total points possible:

Lecture Exams:	300 pts
Lecture Clicker Grade	100 pts (low dropped)
Final Exam	100 pts
Laboratory:	<u>100 pts</u>
Total:	500 pts

Guaranteed grade distribution is as follows:

A = 90-100%	(450-500 points)
B = 80-89.9%	(400-449 ")
C = 70-79.9%	(350-399 ")
D = 60-69.9%	(300-349 ")
F = \leq 59.9%	(\leq 299 points)

Notes on grading philosophy: 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 clarify with the professor any problems regarding course information, as they arise. Advice for students on studying is provided at the URL: <http://www.valdosta.edu/~rgoddard/Study.htm>

MAKE-UP EXAMS: The exam schedule is posted below. It is assumed that because students are registered for this course at the scheduled time and exams are given during this time, all students will be able to attend. Additionally, since one exam grade is dropped, absolutely **NO make-up exams are given.** If you cannot make it to a test at the assigned time for ANY reason, your exam grade will be zero and this will be the grade that is dropped in the computation of your final grade. In no circumstance should a student registered for this course miss two exams. If you know you will miss more than one exam time, you should **DROP THIS COURSE NOW.**

EXAM SCHEDULE:

NOTE: YOU MUST BRING YOUR CLICKER WITH YOU FOR ALL EXAMS FOR YOUR EXAM ANSWERS TO BE RECORDED!

You will have the class time only to complete each lecture exam and 2 hours for the final.

Exams will consist of multiple choice questions. The exam schedule is as follows:

Exam 1:	9 February 2012
Exam 2:	22 March 2012
Exam 3:	26 April 2012
Final Examination:	Thursday, May 3, 2012. 10:15 a.m. - 12:15 p.m. in the lecture room

Procedure for exams:

- *Except for one clicker*, no books, electronic devices (including cell phones), or notebooks will be allowed during exams. Students using such items will be asked to leave and will receive a zero for the exam.
- A student with more than a single clicker in their possession during any exam or lecture constitutes cheating by the owners of the clickers and the person in possession of the clickers. All clickers present will be confiscated and their owners will receive a zero for the exam or the course depending on circumstances. Clickers will be returned to the owners after investigating the circumstances of the infraction.

- No talking will be allowed during the exam, but students are welcome to come to the instructor's desk to ask questions about the exam. If a cell phone rings during an exam, disrupting the exam, the student will be asked to leave. *Turn off your cell phones during exams!*
- Every student should bring their University ID.

BlazeView. Some resources will be made available through BlazeView. To access BlazeView, select the link near the upper right corner of the Valdosta State University homepage or go directly to the following address.

<http://blazeview.valdosta.edu/webct/entryPageIns.dowebct>.

Students experiencing difficulties using BlazeView should seek assistance through the VSU Microcomputing & System Services HELP-Desk located in Odum Library (telephone 245-4357).

Mid-term, or in-progress grades: The instructor is required to submit in-progress grades prior to mid-term (3/1/12). In this course, students will have feedback on at least one major exam by midterm, several lecture quizzes, lab quizzes, etc.. Because the grading procedure in this course is designed to allow students to recover from initial failures (e.g. one major exam grade is dropped), all students at midterm still have the potential of passing the course. Even a failing mid-term grade can be changed to a grade of excellence (e.g. "A") by the end of the course. Students should therefore carefully evaluate their option of dropping this course by midterm without academic penalty.

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. During examinations, students will routinely be asked to display their VSU student identification cards visibly on the desk top and to make them available for inspection by their instructor and/or assistants.

Academic Integrity: Any behavior suggestive of academic dishonesty will lead to a reprimand, failure of an assignment, or failure of the course at the discretion of the instructor, but based on the severity of the infraction(s). Cooperative learning and group interactions are common and necessary to scientists and this activity is encouraged in the form of laboratory work and discussions about data and information. However, on assignments designed to assess individual learning of material in the class, work must be completed totally independently. Behavior contrary to this principle constitutes cheating. Students should fully understand that plagiarism is not tolerated in this department or by the instructor and full appreciation for the intellectual property of others should be respected completely.

Plagiarism is the representation of someone else's work as your own. You may not blatantly copy phrases, paragraphs, or ideas from another's work. You cannot paraphrase someone else's ideas and use them as your own. You must analyze all data and work by others and then integrate this information with new data and conclusions that you independently synthesize, properly citing past work that supports your conclusions.

Students should read and be familiar with the Biology Department policy on plagiarism:

<http://www.valdosta.edu/biology/documents/biologyplagiarism.doc> and read and understand the University policy on

Academic Integrity:

<http://www.valdosta.edu/academic/AcademicHonestyPoliciesandProcedures.shtml>

Disruptive behavior: No disruptive behavior of any kind will be tolerated in this course. Talking during lectures is disruptive due to the nature of the acoustic design of the room. Students should restrict talking and discussion to pertinent questions related to course material and these questions should be directed toward the instructor. Entering a classroom late is discouraged, particularly from the front of the room, because it is disruptive, as is leaving early. Any student disrupting lectures will be required to leave the classroom. Use of cellular telephones, pagers, or any similar remote communication device is prohibited during scheduled lectures, laboratories, or examinations. If students bring cellular telephones or similar devices to lecture, it is their responsibility to switch them off prior to the beginning of the lecture period. Ringing, buzzing, or any other sounds emitted from such devices will be treated as disruptive behavior on the part of the owner/possessor, and the owner/possessor will be asked to leave lecture immediately (including during exams!).

Privacy Act (FERPA): The Family Educational Rights and Privacy Act (FERPA) prohibits the public posting of grades by social security number or in any manner personally identifiable to the individual student. No grades can be given over the telephone, as positive identification cannot be made by this manner. Students may check their grades and unreturned papers/exams any time during the instructor's office hours (BC 2090).

Students with Disabilities: Students requesting classroom accommodations or modifications due to a documented disability must contact the Access Office for Students with Disabilities located in Farber Hall. The phone numbers are 245-2498 (V/VP) and 219-1348 (TTY). <http://www.valdosta.edu/access/>.

TENTATIVE COURSE LECTURE MATERIAL OUTLINE:

Lecture #	Date:	Topics:	Text Readings (pgs):
1	10 Jan.	Introduction, What is science? What is Biology?	1-19
		<i>Additional Reading: Genomes: 365-366; Evolution: 440-444, 445; Phylogeny: 465, 470-471; Species concept: 482-487; Biological Nomenclature: 476-477, 478.</i>	
2	12 Jan.	What is Biology: Unifying principles of life	
3	17 Jan.	Characterization of Life, Evolution and Diversity	
		<i>Additional Reading: Earth history: 519-534 (skim); Domain structure: 536-539; Endosymbiosis: 561-566; Ecology: 1141-1142</i>	
4	19 Jan.	Origin of life	65-73
5	24 Jan.	Chemistry of Life; Organic molecules, Macromolecules and the origin of life	20-36; 38-67
6	26 Jan.		
7	31 Jan.	Cell Structure & Function	68-91
8	2 Feb.		
9	7 Feb.	Origin of Eukaryotic cells	92-95
10	9 Feb.	Exam 1	
11	14 Feb.	Biological Membranes; Osmosis, Diffusion, Water Potential, and Transport mechanisms; Water, pH	97 - 117
12	16 Feb.		
13	21 Feb.	Cell Communication	332-349
14	23 Feb.	Basic Metabolism: Energy, Enzymes; Biochemistry	118 -137
15	28 Feb.	(cont'd)	
16	1 Mar.	Midterm; Last day to drop without penalty	
17	6 Mar.		
18	8 Mar.	Cellular Respiration	138 -159
	12-16 Mar.	Spring Break day, no class	
19	20 Mar.	Photosynthesis	160 - 179
20	22 Mar.	Exam 2	
21	27 Mar.	Cell Division Cycle, Mitosis, Meiosis, Sexual life histories	180 - 205
22	29 Mar.		
23	3 Apr.	DNA Structure and Replication; Protein Synthesis	232 - 281
24	5 Apr.		
25	10 Apr.	Regulation of Genetic Expression	282 - 331
26	12 Apr.	Con't ...	
27	17 Apr.		
28	19 Apr.		
29	24 Apr.	Recombinant DNA technology; Restriction Enzymes, Vectors, and Hosts	352 - 399
30	26 Apr.	Exam 3	
	3 May	Comprehensive Final Exam: 10:15 a.m. – 12:15 p.m.	

LABORATORY EXERCISES

Date:	Topic:
Jan. 11-12	Laboratory Safety: Exercise 1: "The Black Box" - Scientific Method;
Jan. 18-19	Exercise 2: Basic Light Microscope Operation and Microscope checkout: Use of the Light Microscope
Jan. 25-26	Exercise 3: Light Microscopy Observations of cells and organisms; Basic "5 Kingdom" levels of organization; Independent microscopy lab proposals discussed.
Feb. 1-2	Exercise 4: Independent Microscopy Projects; Project proposal lab
Feb. 8-9	Exercise 4: Independent Microscopy Projects: Distribution of microscopic flora and fauna; Data collection lab
Feb. 15-16	Exercise 5: Cellular Water Relations
Feb. 22-23	Exercise 6: Protein extraction from biological tissues and determination of total protein, Spectrophotometry and Standard Curves
Feb. 29	Exercise 7: Enzymology Lab: basics of α -amylase activity;
Mar. 7-8	Exercise 8: Enzyme Regulation: "Investigation of the effects of temperature and pH on enzyme activity"
Mar. 14-15	Spring Break, No Labs
Mar. 21-22	Exercise 9: Photosynthesis
Mar. 21-22	Exercise 10: Mitosis / cell division
Mar. 28-29	Exercise 11: Start: Isolation of plasmid DNA from <i>E.coli</i> and restriction with MspA11 and Start: Exercise 12: PCR-based VNTR Human DNA typing
Apr. 4-5	Finish Exercise 11, 12: Agarose Gel Electrophoresis
Nov. 11-12	Exercise 13: Identification of foodstuffs from genetically modified organisms. Finish gels for exercise 11 and 12.
Nov. 18-19	Exercise 14: Transformation of the pGLO plasmid into bacteria.
Nov. 25-26	Finish analyses, Lab Clean-Up, Last Quiz

VSU administration has required that certain elements be included in all class syllabi. One of these requirements is that relevant course learning outcomes must be linked to the VSU General Educational Outcomes at <http://www.valdosta.edu/academic/VSUGeneralEducationOutcomes.shtml> and to the Biology Department educational outcomes listed on page 113 of the current undergraduate catalog (2009-10). Students should be aware that the Biology department learning outcomes are extremely general and a more appropriate detailed outline of the learning outcomes we expect are represented by the ETS Biology Major Fields Test that we require seniors to complete and pass with a minimally acceptable score before graduating (see: http://www.ets.org/Media/Tests/MFT/pdf/mft_testdesc_biology_4bmf.pdf).

VSU General Education Outcomes (lined out outcomes are not expected for this course)

- ~~*Students will demonstrate understanding of the society of the United States and its ideals. They will possess the requisite knowledge of the society of the United States, its ideals, and its functions to enable them to become informed and responsible citizens. They will understand the connections between the individual and society and the roles of social institutions. They will understand the structure and operational principles of the United States government and economic system. They will understand United States history and both the historical and present role of the United States in the world.~~

- ~~2. *Students will demonstrate cross-cultural perspectives and knowledge of other societies. They will possess sufficient knowledge of various aspects of another culture, including the language, social and religious customs, aesthetic expression, geography, and intellectual and political history, to enable them to interact with individuals within that society from an informed perspective. They will possess an international viewpoint that will allow them to examine critically the culture of their own nation and to participate in global society.~~
3. Students will use computer and information technology when appropriate. They will demonstrate knowledge of computer concepts and terminology. They will possess basic working knowledge of a computer operating system. They will be able to use at least two software tools, such as word processors, spreadsheets, database management systems, or statistical packages. They will be able to find information using computer searching tools.
4. Students will express themselves clearly, logically, and precisely in writing and in speaking, and they will demonstrate competence in reading and listening. They will display the ability to write coherently in standard English; to speak well; to read, to understand, and to interpret the content of written materials in various disciplines; and to listen effectively and to understand different modes of communication.
5. Students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices. They will understand the basic concepts and principles underlying scientific methodology and be able to collect, analyze, and interpret data. They will learn a body of scientific knowledge and be able to judge the merits of arguments about scientific issues. They will be able to perform basic algebraic manipulations and to use fundamental algebraic concepts to solve word problems and equations. They will be able to use basic knowledge of statistics to interpret and to analyze data. They will be able to evaluate arguments based on quantitative data.
- ~~6. *Students will demonstrate knowledge of diverse cultural heritages in the arts, the humanities, and the social sciences. They will develop understanding of the relationships among the visual and performing arts, literature and languages, and history and the social sciences. Students will be versed in approaches appropriate to the study of those disciplines; they will identify and respond to a variety of aesthetic experiences and engage in critical thinking about diverse issues. They will be able to identify the components of and respond to aesthetic experiences in the visual and performing arts. They will develop knowledge of world literature within its historical and cultural frameworks. They will understand modern issues within a historical context and the role of the individual in various forms of societies and governments.*~~
7. Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written, and visual materials. They will be skilled in inquiry, logical reasoning, and critical analysis. They will be able to acquire and evaluate relevant information, analyze arguments, synthesize facts and information, and offer logical arguments leading to creative solutions to problems.
8. Students will demonstrate knowledge of principles of ethics and their employment in the analysis and resolution of moral problems. They will recognize and understand issues in applied ethics. They will understand their own value systems in relation to other value systems. They will judge values and practices in a variety of disciplines.

*. Mission statement not addressed in BIOL 1107.

Biology Department Educational Outcomes (as outlined in the Undergraduate catalog)

The program of study in the Department of Biology has numerous desired outcomes. Examples of these outcomes include the following:

1. Develop and test hypotheses, analyze data, and present the results and conclusions in both written and oral formats corresponding to those used in peer-reviewed journals and at scientific meetings.
2. Describe the evolutionary processes responsible for biological diversity, explain the phylogenetic relationships between the major taxa of life, and provide illustrative examples.
3. Demonstrate an understanding of the cellular basis of life.
4. Relate the structure and function of DNA/RNA to the development, functioning and reproduction of living organisms.
5. 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.