

**BIOL 1107K: Principles of Biology I**  
**Summer II Semester 2012, 4 Credit hours (weekly: 3 hr lecture, 3 hr lab)**  
**Department of Biology, College of Arts & Science, Valdosta State University**

**Lecture (BC 1025): M T W R 9:35 a.m. – 11:00 a.m.**

**Laboratory (BC 1083): Section A (CRN #50099): T & R / 11:10 a.m. - 2:00 p.m.**

**Section B (CRN #50852): T & R / 2:10 a.m. - 5:00 p.m.**

**Instructor: Dr. Brian C. Ring**

Office: BC 2092

Office hours: **M W** 11:00 a.m. – 12:00 p.m. (after lecture)

Phone: 229-249-4841 (Dept. office 333-5759)

email: bcring@valdosta.edu (**please use WebCT first**)

**Pre-Requisites:** None. Note this course is for science majors.

**Co-Requisites:** BIOL 1100, Biology Freshmen Seminar.

**Course Description:** 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.

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

- 1) Exhibit a broad perspective on the principles unifying various biological disciplines from evolution to molecular biology (DBEO 2 & 5);
- 2) Understand basic biological chemistry from elements to organic compounds to macromolecules;
- 3) Comprehend basic principles of biology at the cellular level to include structure, function, metabolism, communication, reproduction, molecular biology, and gene expression (DBEO 3 & 4);
- 4) Perform, analyze, interpret, and report laboratory experiments (DBEO 1);
- 5) Develop and test a hypothesis using experimental microscopy and quantitative skills acquired in the laboratory (DBEO 1 & 5).

These objectives support the Department of Biology Educational Outcomes # 1-5 listed above (DBEO 1-5) and the University General Educational Outcomes # 5 as listed in the VSU Undergraduate Catalogue.

**Required Materials:**

**Text:** Sadava, D., H. C. Heller, G. H. Orians, W. K. Purves, D. M. Hillis. 2008. Life: The Science of Biology. 8th edition. Sinauer Associates Inc., Sunderland, MA and W.H. Freeman & Co. Gordonsville, VA.

**Laboratory Manual:** Goddard, R.H. 2004. Methods and Investigations in Basic Biology, 3rd ed. Cengage Learning

**Graded Course Components:** Your final grade will be based primarily on your performance on lecture examinations the laboratory. Additional summative exercises will be executed during lecture requiring individual and group effort to prepare you (the student) for lecture exams (formative assessment).

**Lecture:** (400 pts) There will be 4 lecture exams and lecture exercises covering sequential material as outlined below. Due to the accelerated pace of the summer semester this exam schedule equates to one exam every other week. Students are required to learn the lecture material and the readings from the text for exams. Related information presented in the laboratory may also be included in these exams. Exams will be primarily composed of multiple choice and short answer. Each of the exams will be worth 100 points or 1/5 of your final grade. Lecture Exam 4 will be taken during the allotted Final Exam time specified for summer session II (see below). **There are NO MAKEUP EXAMS.**

**Laboratory:** (100 pts) Students will be graded on their performance in laboratory based on attendance, participation, quiz grades, selected homework assignments, group lab projects, and other assignments. As the laboratory is considered an extremely important part of this course, any **student missing more than 3 laboratory sessions will automatically receive an F. There are NO MAKEUP LABS.** The laboratory grade is adjusted to 100 percentage points and is therefore worth 1/5 of your final grade. See the laboratory syllabus below for further details.

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

Lecture Exam 1:	100 pts
Lecture Exam 2:	100 pts
Lecture Exam 3:	100 pts
Lecture Exam 4:	100 pts
Laboratory:	<u>100 pts</u>
<b>Total:</b>	<b>500 pts</b>

Guaranteed grade distribution is as follows:

A = 90-100%	(450-500 points)
B = 80-89%	(400-449 " )
C = 70-79%	(350-399 " )
D = 60-69%	(300-349 " )
F = $\leq$ 59%	( $\leq$ 299 points)

**Notes on grading philosophy:** Students should note that a grade of "A" in this course represents an exemplary command of the material. 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. Additionally, the instructor may implement a curve based on the overall class performance at the end of the course.

**Mid-term, or in-progress grades:** The instructor is required to submit in-progress grades prior to mid-term (6/29/12). In theory, a mid-term grade is necessary for a student to assess how s/he is doing in class by midterm. In this course, students will have feedback on at least one major exam by midterm, several lab quizzes, lab assignments, and any homework or writing assignments. I will, in general, assign an overall average grade at this point on the normal scale of A-F viewable on Banner. Students receiving a grade of "D" or lower should therefore carefully evaluate their option of dropping this course by midterm without academic penalty.

**Attendance:** Attendance in this course is absolutely required. Students should be seated at the beginning of class. If you are late, your attendance may not be acknowledged. Attendance may be taken at any time during the lecture. 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 as stated above. In the event that a student will miss a lab, s/he should notify the instructor in writing by email. It is the instructor's prerogative to accept the excuse or not.

**EXAM SCHEDULE:**

<b>Exam 1:</b>	<b>Thursday, June 14, 2012</b>
<b>Exam 2:</b>	<b>Thursday, June 28, 2012</b>
<b>Exam 3:</b>	<b>Thursday, July 12, 2012</b>
<b>Exam 4:</b>	<b>Thursday, July 27, 2008; 10:15 a.m. – 12:15 p.m.</b>

**NOTE:** You will have the class time only to complete each lecture exam.

**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 can not be made by this manner. Grades will be posted through BlazeView course website.

**Disruptive behavior:** No disruptive behavior of any kind will be tolerated in this course. 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 or early is discouraged. 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.

**Biology Tutoring:** The Student Success Center (SSC) at Valdosta State University is located in Langdale Residence Hall above the Tech Shop and is available to all students. The SSC provides free peer tutoring in core curriculum courses, including biology, chemistry, math, writing, and foreign languages. The SSC also provides free professional academic advising and on-campus job information in one location. Call 333-7570 to make an appointment, or visit the website: [www.valdosta.edu/ssc](http://www.valdosta.edu/ssc).

**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 the Farber Hall. The phone numbers are 245-2498 (V/VP) and 219-1348 (TTY).

## TENTATIVE LECTURE OUTLINE:

Lecture:	Date:	Topics:	Text Readings (pgs):
1	June 06 (W)	Introduction: What is science?	Chpt. 1 (13-17)
2	June 07 (R)	What is Biology? Unifying Principles...	Chpt. 1 (1-12), Suggested: Evolution (440-444) Phylogeny (465, 470-471) Species Concept (482-487) Nomenclature (476-478)
3	June 11 (M)	Basic Chemistry, water, & pH Organic Molecules	Chpt. 2 (20-36) Chpt. 3 (38-41)
4	June 12 (T)	Major Macromolecules: Proteins, Carbohydrates, Lipids, & Nucleic Acids	Chpt. 3 (42-58) Chpt. 4 (60-64)
5	June 13 (W)	Catch up & Review	
--	<b>June 14 (R)</b>	<b>EXAM # 1</b>	<b>Lecture material 1-5</b>
6	June 18 (M)	Basic Unit of Life: Cells	Chpt. 5 (76-101)
7	June 19 (T)	Cell Membranes: Principles & Transport	Chpt. 6 (105-124)
8	June 20 (W)	Cont'd...	
9	June 21 (R)	Cell Signaling & Communication	Chpt. 7 (128-144)
10	June 25 (M)	Energy, Enzymes, & Metabolism	Chpt. 8 (148-164)
11	June 26 (T)	Cont'd...	
12	June 27 (W)	Catch up & Review	
--	<b>June 28 (R)</b>	<b>EXAM # 2</b>	<b>Lecture material 6-12</b>
--	<b>June 29 (F)</b>	<b>Midterm; Last day to drop without penalty</b>	
13	July 02 (M)	Cellular Respiration	Chpt. 9 (168-185)
14	July 03 (T)	Cont'd ...	
--	July 04 (W)	NO CLASS	
--	July 05 (R)	NO CLASS	
15	July 09 (M)	Photosynthesis	Chpt. 10 (189-205)
16	July 10 (T)	Cont'd ...	
17	July 11 (W)	Catch up & Review	
--	<b>July 12 (R)</b>	<b>EXAM # 3</b>	<b>Lecture material 13-18</b>
18	July 16 (M)	Cellular Reproduction: Mitosis & Meiosis	Chpt. 11 (209-229)
19	July 17 (T)	Molecular Biology I: DNA Structure and Replication	Chpt. 13 (266-286)
20	July 18 (W)	Cont'd ...	
21	July 19 (R)	Molecular Biology II: RNA Transcription & Protein Synthesis	Chpt. 14 (290-308)
22	July 23 (M)	Cont'd ...	
23	July 24 (T)	Prokaryotic & Eukaryotic Gene Expression	Chpt. 15 (352-361)
24	July 25 (W)	Cont'd ...	
--	July 26 (R)	Catch-up, review...	
--	<b>July 27 (F)</b>	<b>EXAM # 4; 10:15 – 12:15 (BC 1025)</b>	<b>Lecture material 19-23</b>

**TENTATIVE LABORATORY EXERCISES:**

<b>Lab</b>	<b>Day:</b>	<b>Topic:</b>
<b>1</b>	June 07 (R)	Introduction to the Lab, Safety, and Laboratory Notebooks
<b>2</b>	June 12 (T)	<b>Exercise 1:</b> Introduction to the Use of the Scientific Method
<b>3</b>	June 14 (R)	<b>Exercise 2:</b> Basic Light Microscopy
<b>4</b>	June 19 (T)	<b>Exercise 3:</b> Light Microscopy Observations of cells and organisms; Basic "5 Kingdom" levels of organization.
<b>5</b>	June 21 (R)	<b>Exercise 4:</b> Group Microscopy Project: Proposal Discussion <b>A1 Due: Group Proposal (end of class), read Appendix A</b>
<b>6</b>	June 26 (T)	<b>Exercise 4 Cont'd:</b> Independent Microscopy Project: Data collection lab; Distribution of microscopic flora and fauna. <b>A2 Due: Exercise 4, Summary of Group Results (end of class), see Appendix B</b>
<b>7</b>	June 28 (R)	<b>Exercise 5:</b> Cellular Water Relations
<b>8</b>	July 3 (T)	<b>Exercise 6:</b> Protein extraction & Quantification from living tissues <b>Read Appendix C &amp; D</b> <b>N1:</b> Notebook check # 1
--	July 5 (R)	<b>NO LABS</b>
<b>9</b>	July 10 (T)	<b>Exercise 7:</b> Enzymology Lab: basics of $\alpha$ -amylase activity <b>A3 Due: Group Research Paper (Exercise 4)</b>
<b>10</b>	July 12 (R)	<b>Exercise 8:</b> Enzyme Regulation: Investigation of the effects of temperature and pH on $\alpha$ -amylase activity
<b>11</b>	July 17 (T)	<b>Exercise 10:</b> Cellular Reproduction
<b>12</b>	July 19 (R)	<b>DAY 1 of 2:</b> <b>Exercise 14:</b> Bacterial Transformation of Recombinant Green Fluorescent Protein (GFP) <b>Exercise 12:</b> PCR-based VNTR Human DNA Typing
<b>13</b>	July 24 (T)	<b>DAY 2 of 2:</b> Finish above.
<b>14</b>	July 26 (R)	<b>Catch up &amp; Clean up</b> <b>N2:</b> Notebook check # 2

**Summary of Laboratory Grade (100 points):**

<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q6</b>	<b>Q7</b>	<b>Q8</b>	<b>Q9</b>	<b>Q10</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>N1</b>	<b>N2</b>	<b>P</b>	<b>Total</b>
20	20	20	20	20	20	20	20	20	20	20	20	40	25	25	25	y
																x

**Q=** Laboratory Quiz, **A=** Laboratory Assignment in or outside of class, **N=** Laboratory Notebook Check, **P=** Participation

Your laboratory grade is computed as a percentage of your total points (x) from the total possible (y), where  $(x / y) \times 100 =$  laboratory percentage (Note: total subject to change). Use the empty third row in the table above to keep track of your individual points and lab percentage at any point in the semester. Quizzes are given weekly at the beginning of lab during the first 20 minutes. You will have only the time allotted at the beginning of lab to take the quiz. No make-up quizzes allowed. Assignments are listed in the above Laboratory Exercises as A1-A4 along with a description. Notebook checks are listed twice during the semester and are performed during class time or at the discretion of your instructor(s). Participation is awarded based on continuous effort of the student both individually and as a group member as observed by the instructor.