BIOL 1030 Introduction to Biology: Organismal Biology. Spring 2011

Department of Biology, College of Arts & Sciences, Valdosta State University

From the VSU Undergraduate Course Catalog: "*An introduction to modern biology for the non-major with special emphasis on the processes involved in the development and maintenance of complex multicellular organisms.*"

Section A Mon/Wed/Fri 12:00 – 12:50 PM Bailey Science Center 3009

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Office Hours: 2:00 – 3:00 PM Mon & Wed. Drop by anytime within that slot, or otherwise, if I'm in my office. I'm also very good at responding to e-mail — use it anytime and I'll usually get back to you within the day.

Course Objectives: This course introduces non-Biology major, undergraduate students to the molecular and cellular biology, genetics, and physiology of multicellular life forms. Students are expected to demonstrate a basic understanding and knowledge of this biology, with an emphasis on the chemistry of life, the cell, respiration, photosynthesis, mitosis, meiosis, genetics, protein synthesis, structural and physiological adaptations of organisms, and DNA technology.

The course fulfils three of the eleven general education credit hours required in section D1 (Science, Mathematics, and Technology) of the VSU core curriculum as prescribed by the University System of Georgia. This course and the BIOL 1040 Organismal Biology Lab are co-requisites that complement each other by covering parallel material, though not necessarily in the same order. Upon completion of this course "students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written, and visual materials" (VSU General Educational Outcome #7). Furthermore, students should be able to "demonstrate an understanding of the cellular basis of life" (VSU Biology Dept. Educational Outcome #3), and "relate the structure and the function of DNA/RNA to the development of form and function of the organism and to heredity" (VSU Biology Dept. Educational Outcome #4)

Textbook: *Biology: Concepts & Investigations*, 2009, 1st Edition, by Mariëlle Hoefnagels

The textbook provides critical scientific content and is written from a strong evolutionary perspective. The readings listed in the Course Schedule within this syllabus should be completed before the lecture for the day on which they are listed. Periodic, very brief, unscheduled, in-class assignments will evaluate your understanding of these readings and your participation in the course. Any information in the assigned textbook readings can be included on the examinations, whether or not it is an explicit part of my lectures. The text's accompanying Web site (http://www.mhhe.com/hoefnagels) can be very helpful and I recommend that you take advantage of the diverse collection of images, animations, practice quizzes, and tutorials among its material.

Attendance: Class attendance is mandatory. Roll may be taken at any point, but will also be ascertained through completion of the unscheduled, short, in-class assignments. If you must miss a class, you are responsible for the missing material. It is quite unlikely that you will be able to perform well on the exams, if you miss too many classes. Also, show up to class on time; I will not wait for you. And, if you ever are forced to be late, enter through the rear doors without disturbing the class. Furthermore, the university mandates the following attendance policies, which I must enforce: (1) "A student who misses more than 20% of the scheduled classes of a course will be subject to receiving a failing grade in the course." (2) "Instructors may assign a 'W' on the proof roll for students not attending class. It is the responsibility of the student to complete the withdrawal process…. The instructor may assign a grade of 'W' or 'WF' after mid-term." (3) "Any student who discontinues class attendance after mid-term and does not officially withdraw may be assigned a grade of 'F'."

Assessment/Grading: There will be five multiple choice exams: four topical tests, worth 10% each, delivered throughout the semester during standard class time, that cover the material within that section; and one comprehensive final, worth 40%, given during the university-wide scheduled time period. Make-up exams will only be offered under the most serious of situations, will require you to notify me a minimum of 24 hours beforehand, and will be given entirely at my discretion. They will be much harder than the regular exams, probably being of an oral or written short essay format, so I do not recommend going that route, unless it is absolutely necessary!

The remaining 20% of your grade comes from those participation assignments mentioned above, and from your attendance record. These points can all be considered bonuses — everybody should get their full value by just doing the required short assignment work, which will be very easy, and by showing up and participating in the course for every session. Furthermore, up to another 20% of various extra credit opportunities are available throughout the semester — I encourage you to take advantage of these!

Your final grade is based on the standard scale. A: 100–90%, B: 89–80%, C: 79–70%, D: 69-60%, F: 59–0%, though I may uniformly lower the scale a point or two, depending on the distribution at the end of the semester.

Homework/Extra Credit Policy: As mentioned, an additional 20% course credit is available through extra credit work. Up to 10% of these can be descriptions of biology seminars that you attend (these will be announced throughout the semester); and write-up/reviews of biologically relevant news stories, Web sites (that we have not visited in class), video documentaries, nonfiction books, journal articles, etc; and/or standard research-style papers. I will award credit based on the length and content of these pieces, in general around 1% per page, though they need to be more than just 'cut-and-paste' blurbs. Furthermore, you absolutely need to cite all of your references — journals, newspapers, magazines, books, television series, and/or Web sites. Without proper citation, you will not be given credit for this work! And, any Web site used must be reputable — this is entirely my call. I will accept these extra credit pieces at any point throughout the semester, but absolutely no later than Friday, April 15. The remaining 10% of available extra credit comes from an optional essay on Exam #4. I will not warn you of this essay's topic, other than to tell you that it will most likely be provocative, and will require you to think and synthesize concepts learned throughout the semester to answer.

Breakdown:

Examinations	4 Topical Exams (10% Each on Sections I-IV)	40%
	Comprehensive Final Exam	40%
Other Factors	Short Assignments and Attendance Rosters	20%
Extra Credit	Homework and Seminar write-ups	10%
	Optional Essay on Exam #4	10%
Total:		**120**%

Academic Honesty: Students are expected to maintain high standards of integrity. The VSU Academic Conduct Code (http://www.valdosta.edu/judicial/AcademicStudentConductCode.shtml) is a basic behavioral standard, but everyone in the class is required to read the Biology Department Plagiarism Policy (http://www.valdosta.edu/biology/documents/biologyplagiarism.doc) as well. Never copy text or illustrations from a book or Website and represent it as your own — always cite your sources of information. Do not cheat in any manner! Using any type of aid on in-class assignments or exams, other than your own brain, is cheating. Dishonesty will not be tolerated, and any student misconduct will be reported to the Office of the Dean of Students. Evidence of cheating will result in no credit for the assignment or exam, and depending on the case, could result in a failing grade for the entire course.

Disruptive behavior: You are adults and are expected to behave as such. I expect everyone to be considerate of their fellow students. Any disruptive behavior that interferes with the teaching of the lecture or disturbs other students or faculty will not be tolerated. This includes cellular phone usage during class time and any other non-class related communication between students. You are also not supposed to bring food or drink into the lecture hall. Any student who disrupts the class will be removed from the class and possibly dropped from the course. Refer to the VSU Non-Academic Conduct Code for further information (http://www.valdosta.edu/judicial/ConductViolations.shtml).

Family Educational Rights & Privacy Act: By Federal law, grades cannot be posted by Name, Social Security Number, or other Personal Identifiers. Scores and student work evaluations will not be given over the telephone, by e-mail, or to another student. You must speak to me personally or wait for your official grades.

American Disabilities Act: Students requiring classroom accommodations or modifications because of a documented disability should discuss this need with the instructor at the beginning of the semester. These students must register with the Access Office (http://www.valdosta.edu/access/) located in Farber Hall, 229-245-2498 (V/VP) and 229-219-1348 (TTY), e-mail access@valdosta.edu.

Student Assistance: The Student Success Center (SSC) is located in Langdale Residence Hall and is available to all students. The SSC provides free professional and academic advising, peer tutoring in core courses, and campus job information. Phone: 229-333-7570 or email: ssc@valdosta.edu.

Course Schedule (subject to change at the instructor's discretion):

Date	Topic	Reading Assignment
M Jan 10	**Section I**: What is Life? Common themes of molecular/cellular/physio biology	
	Syllabus overview and course introduction	
W Jan 12	Biochemistry — atoms and molecules	Chapter 2
F Jan 14	What is a cell? Ultrastructure and membranes, part I	Chapter 3
M Jan 17	MLK Birthday Holiday: no classes!	
W Jan 19	Cell ultrastructure, part II	
F Jan 21	Energy metabolism I	Chapter 4
M Jan 24	Energy metabolism II	
W Jan 26	Energy metabolism III	Chapter 6
F Jan 28	Photosynthesis, oh yeah …	Chapter 5
M Jan 31	**Section I Exam**	
W Feb 2	Student Success Center presentation — now that you've taken one of my exams!	
F Feb 4	**Section II**: Molecular and classical genetics	
	What is DNA and how does it replicate?	Chapter 7
M Feb 7	The cell cycle	Chapters 8
W Feb 9	Cellular division — mitosis	
F Feb 11	Sex: [just about] everybody does it!	Chapter 9
M Feb 14	And the way it works — meiosis	
W Feb 16	Classical genetics	Chapter 10
F Feb 18	Human genetics	Chapter 11
M Feb 21	DNA transcription and regulation	Chapter 12
W Feb 23	DNA technologies — way more than CSI	
F Feb 25	**Section II Exam**	
M Feb 28	**Section III**: The primary producers — algae (and other 'lower' autotrophs) thru plants	
	Presentation and herbarium tour by Dr. Richard Carter	
W Mar 2	'Higher' plant form and function	Chapter 24
Th Mar 3	Spring Midterm: Last day to withdraw!	
F Mar 4	How plants get the stuff they need	Chapter 25
M Mar 7	Flowering plant reproduction and development	Chapter 26
W Mar 9	*The Botany of Desire* by Michael Pollan, as presented by PBC, "The Apple"	
F Mar 11	*The Botany of Desire*, "*Cannabis*"	
M Mar 14	Spring Break!	
W Mar 16	Spring Break!	
F Mar 18	Spring Break!	
M Mar 21	**Section III Exam**	

W Mar 23	**Section IV**: Animal physiology and embryology	
	Tissue and organ systems in animals	Chapter 27
F Mar 25	The nervous system	Chapter 28
M Mar 28	The senses	Chapter 29
W Mar 30	Regulation — controlling it all — the endocrine system	Chapter 30
F Apr 1	Regulation — controlling salts and toxins — the renal system	Chapter 35
M Apr 4	Motion — the skeleton and muscles	Chapter 31
W Apr 6	Oxygen and glucose in, CO_2 and other wastes out — circulation	Chapter 32
F Apr 8	Just oxygen in and CO_2 out — respiration	Chapter 33
M Apr 11	Keeping the machinery going — eating other life	Chapter 34
W Apr 13	Keeping the machinery going — nutrition and eating habits	
F Apr 15	Keeping the bad guys at bay — immunology I	Chapter 36
M Apr 18	Keeping the bad guys at bay — immunology II	
W Apr 20	Human sexual physiology	Chapter 37
F Apr 22	Animal embryology and development	
M Apr 25	**Section IV Exam**	
W Apr 27	Biotechnology — the background	
F Apr 29	Biotechnology — 'Frankenfoods' cloning, biomedical miracles, and other fables	
M May 2	Review and Exam preparation	
Th May 5	**Comprehensive Final Exam** from 12:30 to 2:30 PM	

What to expect and how to excel: This course will require you to think, duh. It will not be about rote memorization, although the vocabulary of biology is an absolutely necessary component that will mandate some memorization. But remember, it is just English, and most words break down into roots that make sense. Sure, some of the descriptive roots are Latin derivatives, but most have uses in other English words as well. The big picture is what matters — how it all fits together, how all the parts relate to each other, what are those key innovations of the different branches of life, how it all came to be. And, as the famous classical evolutionist Theodosius Dobzhansky stated back in 1973, "Nothing in biology makes sense except in the light of evolution."* Evolution provides the single, unifying, cohesive force that allows all of life to be explained. It is to the life sciences what the long sought holy grail of the unified field theory is to astrophysics. Therefore, you will need to think about everything in this course in that light in order to be successful in the course!

As an instructor I can only facilitate your learning by offering good examples and by trying to explain phenomenon. It is your responsibility to truly understand and comprehend the concepts. You absolutely need to interact with me. If you do not understand things, discuss them with me — either in class or in person in my office. Decide to start working hard right away. It is impossible to blow off the beginning of the course and still get a decent grade, because everything builds off the initial concepts taught at the start of the course. You will need to attend class and take decent notes. My lectures do not come directly from the textbook; they incorporate examples from my own and others' actual research. It's all fair game for exams. Plus, I give those short assignments and pass attendance rolls

around periodically throughout the semester. If you miss them, you lose out on a very easy 20% of your total grade. I also encourage you to take advantage of all extra credit opportunity. This can be up to another 20%, between the homework and seminar write-ups and the forth exam optional essay question. Get to know your fellow students — working together in group exam study sessions can be a big help. Furthermore, many copies of my old exams from previous semesters are out there — I purposely give them back for students to study from for the final — you're welcome to study off them as well, but I will not provide them to you. I do not consider this cheating. However, the content does change somewhat from semester to semester. Along these lines, it is your responsibility to pick up your old exams. The comprehensive final is built directly off them! Above all else, try to have fun learning this stuff — biology is fun!

* The source of the original 1973 quote is a bit obscure though it has been cited as being transcribed from an article Dobzhansky wrote for the *American Biology Teacher*, 1973. 35, pp 125-129.