

BIOL 1030 Introduction to Biology: Organismal Biology. Fall 2009

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 D Tues/Thurs 12:30 – 1:45 PM Bailey Science Center, lecture hall 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 topics that are primarily cellular and molecular. Students are expected to demonstrate a basic understanding and knowledge of 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 fulfills 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 must be completed before the lecture for the day on which they are listed. Periodic, very brief, unscheduled, in-class and/or out-of-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 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 delivered throughout the semester during standard class time that cover the material within that section, and one comprehensive final given during the university-wide scheduled time period. Make-up exams will only be offered under the most dire 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 essay format, so I do not recommend going that route, unless it is absolutely necessary!

The remaining grading components come from those assignments mentioned above under the Textbook heading and from your attendance/participation 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.

Your final grade is based on the standard scale. A: 100–90%, B: 89–80%, C:79–70%, D: 69-60%, F: 59–0%.

Breakdown:

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|---------------|---|-----|
| Examinations | 4 Topical Exams (10% Each on Sections I-IV) | 40% |
| | Comprehensive Final Exam | 40% |
| Other Factors | Short Assignments (anytime, anywhere) | 10% |
| | Attendance/Participation | 10% |

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 allowed 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 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 is located in Langdale Residence Hall and is available to all students. The SCC 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 whim of the instructor):

| <u>Date</u> | <u>Topic</u> | <u>Reading Assignment</u> |
|-------------|---|---------------------------|
| T Aug 18 | Section I: What is Life? Common themes of molecular/cellular biology | in-class syllabus |
| Th Aug 20 | Biochemistry — atoms and molecules | Chapter 2 |
| T Aug 25 | What is a cell? Ultrastructure and membranes | Chapter 3 |
| Th Aug 27 | Energy metabolism I | Chapter 4 |
| T Sept 1 | Energy metabolism II | Chapter 6 |
| Th Sept 3 | Photosynthesis, oh yeah ... | Chapter 5 |
| T Sept 8 | <u>Section I Exam</u> | |
| Th Sept 10 | Section II: Molecular and classical genetics What is DNA and how does it replicate? | Chapter 7 |

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|------------|--|------------------|
| T Sept 15 | The cell cycle and mitosis | Chapters 8 |
| Th Sept 17 | Sex: [just about] everybody does it! | Chapter 9 |
| T Sept 22 | Classical genetics | Chapter 10 |
| Th Sept 24 | Human genetics | Chapter 11 |
| T Sept 29 | DNA transcription and regulation | Chapter 12 |
| Th Oct 1 | <u>Section II Exam</u> | |
| T Oct 6 | Section III: The primary producers — algae (and others) to plants Let's not forget the 'lower' autotrophs! | |
| Th Oct 8 | Fall midterm date: <u>Last day to withdraw</u> 'Higher' plant form and function | Chapter 24 |
| T Oct 13 | How plants get the stuff they need | Chapter 25 |
| Th Oct 15 | Flowering plant reproduction and development | Chapter 26 |
| T Oct 20 | <u>Fall Break!</u> | |
| Th Oct 22 | <u>Section III Exam</u> | |
| T Oct 27 | Section IV: Animal physiology and embryology Tissue and organ systems in animals | Chapter 27 |
| Th Oct 29 | The nervous system and the senses | Chapter 28 & 29 |
| T Nov 3 | Regulation — the endocrine and renal systems | Chapter 30 & 35 |
| Th Nov 5 | Motion — the skeleton and muscles | Chapter 31 |
| T Nov 10 | Oxygen in, CO ₂ out — circulation and respiration | Chapters 32 & 33 |
| Th Nov 12 | Keeping the machinery going — eating other life | Chapter 34 |
| T Nov 17 | Keeping the bad guys at bay — immunology | Chapter 36 |
| Th Nov 19 | Animal embryology and development | Chapter 37 |
| T Nov 24 | <u>Section IV Exam</u> | |
| Th Nov 26 | <u>Thanksgiving Holiday!</u> | |
| T Dec 1 | Biotechnology — 'Frankenfoods,' cloning, biomedical miracles, and other fables | |
| Th Dec 3 | Review and Exam preparation | |
| T Dec 8 | <u>No class</u> (official Exam Prep day) | |
| Th Dec 10 | <u>Comprehensive Final Exam</u> from 2:45 to 4:45 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. 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 if you are shy, 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 periodically throughout the semester. If you miss them, you lose out on a very easy 10% of your total grade. I encourage you to become friendly with your fellow students and work together on the short out-of-class assignments, and within group exam study sessions. I do not consider that cheating. 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.