BIOL 109

Introduction to Biological Science

Summer 2016

Course Syllabus and Schedule

Framingham State University

Disclaimer: This syllabus is intended to give the student guidance in what may be covered in the course and will be followed as closely as possible. However, the professor reserves the right to modify, supplement and make changes as needs arise.

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Office	By appointment
Credit:	4
Time:	2 hours/day, Mon-Fri

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About Our Course

Welcome! This course is designed to provide conceptual understanding of and hands-on experience conducting biological science to students from a wide variety of academic backgrounds and interests. Why study biology, the science of life, you ask? Well, obviously you're alive for starters, so it doesn't get more relevant than that! You also rely on living organisms for food and other basic needs. From time to time, certain other organisms cause you illness. You have almost certainly benefited from numerous technologies and medicines developed from knowledge of life's inner-workings, and encounter biological topics in various media daily. Simply put, you are immersed in a living world! Our modern society also increasingly needs its citizens to have the scientific understanding necessary to insightfully interpret biological issues. To that end, we will emphasize major concepts in biology, including: levels of organization (atoms to the biosphere), structure and function of organisms and other biological systems, and the origins and maintenance of biodiversity. In addition, this course is designed to foster skills in teamwork, communication, critical thinking, and analysis of data, all of which are transferable to other disciplines and every-day experiences.

CATALOG DESCRIPTION: An introduction to the fundamental concepts of biological science. Topics include structures and processes from molecules to organisms, inheritance and variation of traits, ecosystem interactions, energy and dynamics, and biological evolution. Emphasis is placed on scientific interpretation as well as content. *Note: This course is not open to science or coordinate education majors. Prerequisite: MATH 095 General Mathematics or a satisfactory score on the mathematics placement exam.*

Course Learning Goals

1. To understand fundamental concepts in biology and recognize the connections to your daily life;

2. To critically think about, analyze and evaluate scientific data and knowledge;

3. To practice written and verbal communication skills and effective collaboration with peers; and,

4. To become a more effective and informed citizen that can thoughtfully and actively participate in conversations, evaluate media reports, and make political decisions related to biology/science.
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Required Materials

TEXTBOOK:

Starr, Evers, & Starr. (2015) *Biology: Today and Tomorrow* (the version with physiology). 5th edition.

A loose-leaf version for a 3-ring binder is available at a discounted price at the FSU Bookstore (ISBN 9781305623682). You're welcome to purchase a bound copy (ISBN 9781305117358) from a different vendor.

BLACKBOARD: ***IMPORTANT: our course Blackboard webpage must be accessed from a different URL than is typical. Please use https://framinghamstaging.blackboard.com/ for this course.*** All course resources, including PowerPoints and handouts, will be posted here. Check for updates before every class. I suggest printing and bringing copies of these resources to class to annotate; hardcopies will not be provided.

SUPPLIES: Bring your clicker, notebook, pencil with eraser, and a stapler to every lecture.

Expectations for Work Inside and Outside of the Classroom

Our course meets five times per week, so content will accumulate rapidly. Therefore, it is important to manage expectations with respect to your required investment (time and effort) in this course.

WORK INSIDE THE CLASSROOM: Each week, we have five 120-minute class meetings. **You are expected to be present and actively engaged during all of these times.** During class meetings, lectures will be interspersed with activities to actively engage you with the content. Students will routinely interact in teams of 2-4 students during all class sessions.

WORK OUTSIDE THE CLASSROOM: University policy requires that students engage in two (2) hours of work outside of class for *each* hour spent in class. For this course, you should expect to **put in a minimum of twenty (20) hours of work outside of class *each* week.** A student who is under-performing will need to put in additional time. However, if you find that you are regularly spending well over 8 hours per week, please come see me and we can discuss strategies for time management.

Work outside-of-class consists of: actively reading textbook sections before the assigned class period; organizing, reviewing, and re-writing your lecture notes after every class meeting; completing all assignments; and studying and practicing for exams throughout the semester.

Assignments and Grading

POINT DISTRIBUTIONS: Course grades are based on cumulative performance in the course, and are earned, not "given." A 'C' grade does not indicate poor performance, it indicates average performance.

	Total points	**% of total**
Graded Items		
Unit exams (4)	400 (100 each)	40
Cumulative final exam	200	20
Independent and team activities	150	15
Written assignments	150	15
Attendance and participation	100	10
Total	1000 points	100%

There are **four unit exams** that will cover content from the preceding lecture unit, and one **cumulative final exam.** Since there is no unit exam for Unit 6, the final will be somewhat biased toward Unit 6 content. No exam scores may be dropped. However, if you are not satisfied with an exam score (must be below a 90%), I will allow you to correct your mistakes on **ONE (1)** unit exam of your choice for up to ½ of the lost credit. To take advantage of this option, you must submit your corrected exam with a brief (1-2 sentence) explanation for why the new answer is correct for every question you expect to recover credit for, **within 1 week of receiving the exam grade** (i.e., you cannot decide to correct Exam 1 during the last week of class). This policy does not apply for the cumulative final exam.

Independent and team **activities** are to practice and engage you with the material. These may not be announced in advance, so these assignments are also used to gauge your attendance and participation during lecture. Team activities may consist of individual and shared team points.

Written assignments will be assessed on: effort and depth of thought, completeness, organization/clarity, and presentation. All assignments should be spell-checked and thoroughly proofread (not the same thing) before being submitted; *never* hand in a first draft.

Attendance and participation points can easily make the difference between letter grades at the end of the term. These points must be earned – they are not "free points." You must be present, engaged, interacting (with your peers and instructor), and respectful to earn these points. See the policy on attendance below.

Final grades will be awarded as follows:

A	≥ 93.0 %	C	73.0-76.9 %
A-	90.0-92.9	C-	70.0-72.9
B+	87.0-89.9	D+	67.0-69.9
B	83.0-86.9	D	63.0-66.9
B-	80.0-82.9	D-	60.0-62.9
C+	77.0-79.9	F	≤ 59.9

Other Course Policies: "The Not-So Fine Print"

CLASSROOM ATTENDANCE: Regular, punctual attendance is necessary, or your grade will undoubtedly suffer. In-class activities, assignments, labs, or exams missed due to unexcused absences cannot be made up. **Valid absences** (e.g., due to illness or family emergency) will be excused, provided documentation is furnished. If you miss a lab due to a valid absence, you may attend a different lab section during the same week **only** with prior permission from the instructor. The **third absence from lab will result in automatic failure of the entire course**, regardless of your standing in lecture. Since this course satisfies the general education lab requirement, you must pass the lab component to pass the course. **You must contact me *within 48 hours* following a qualifying absence to be excused and to schedule any granted make-ups.**

ENGAGEMENT DURING CLASS: You are expected to be actively engaged at all times during class. Cell phones must be turned off and stored out of sight. Use of these and other devices during class diverts your attention and impedes your learning, distracts your peers, and is disrespectful to me. **I expect your undivided attention to be directed to me, the supplemental instructor, or your classmates whenever any of the above is speaking, presenting, or engaged with you in collaborative work. Otherwise, you will lose attendance/participation points and may be asked to leave class.**

COMMUNICATION OUTSIDE OF CLASS: I will use **FSU email** for communication outside of the classroom, and I expect all students to check their FSU email account on a daily basis.

The best way to reach me outside of class for questions, to schedule appointments, or provide feedback is through **FSU email.** I will do my best to respond within 24 hours. I consider emails to be professional correspondence. Therefore, emails that do not contain a subject line, are poorly written (e.g., contain incomplete sentences, poor grammar, etc.), or fail to identify the sender may not receive responses.

LATE ASSIGNMENTS: **Late assignments will be penalized 10% per day (weekends are 2 days)**. If there are extenuating circumstances that prevent you from meeting a deadline, you must contact me **before the deadline** to discuss a solution. Otherwise, it is simply not fair to the other students.

COURSE FEEDBACK AND EVALUATION: I will do my best to create a positive learning environment. However, because learning styles differ among students, I may do some things that are not optimal for you. If this happens, you can let me know through email or written comments handed in at the end of the class period, or during office hours. **I do not necessarily know if things are not going well for you if you don't tell me!**

ACADEMIC HONESTY—CHEATING AND PLAGIARISM: Unless specifically authorized by me, you are expected to complete course assignments (including lab write-ups and exams) without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit work you completed for another course to satisfy the requirements for this course. You may not use course materials-sharing websites to complete any work in this course. **Students who violate these policies *will* receive a non-negotiable failing grade for the assignment, the course, or both.**

I have a zero-tolerance policy for cheating. "Cheating" is broadly defined and includes attempting to pass off someone else's work as your own (plagiarism), using course materials-sharing websites, or providing exam answers to others. If you are not sure which specific offenses constitute cheating, please ask. Cheating violates student-peer and student-instructor trust, defames your character, and undermines the value of a college degree. Of course, you also learn nothing by cheating, and therefore I cannot certify (e.g., with a grade) that you have learned the material. **Therefore, students who cheat *will* receive a non-negotiable failing grade for the assignment, the course, or both.**

ACADEMIC ACCOMMODATIONS: If you have a specific disability that qualifies you for academic accommodations, please provide Documentation Confirmation from the Office of Academic Support within the first two weeks of the semester and inform me so that I can develop a plan to work with you. Academic Support is located in the Center for Academic Support and Advising (CASA). Please call (508) 626-4906 if you have questions or if you need to schedule an appointment.

How to Succeed in this Class

Like any college course, what you get out of this class depends upon what you invest. You, as the college student, are solely in control of your own success. Like your textbook, lab manual, and notes, I am a resource and can certainly provide help, but it is ultimately your responsibility to seek me out– I'm always happy to meet. Keeping that in mind, below are six strategies to insure you do well.

1. **Come to every class actively engaged**. You are ultimately responsible for all material covered during all classes, including labs. The points you earn for attendance and participation significantly affect your grade; if you are engaged, respectful, and responsible, you can't go wrong! I am also far more likely to automatically reach out to a struggling student who is making a concerted effort than one who is passive.

2. **Study.** This sounds like a no-brainer, but I am often surprised by what some students actually "do" when they say they are "studying." "Studying" is not something you just do the night before an exam—it should be a part of your daily routine. Keep thorough notes on lecture material, readings, discussions, and lab exercises. Then, after every class, organize, review, and re-write your notes. This will help reinforce material, allow you to write down things you may have missed while they are still fresh, and identify trouble areas. You can then address issues immediately with me during the following class, instead of waiting until the exam. Actively read assigned readings. If you cannot summarize the major points after reading a section without the aid of the book, then you are not reading carefully enough. "Skimming" is not a reading strategy suitable for learning new material—you must actively process the content, or you are simply wasting your time. Lastly, *never* cram for an exam! Prepare gradually over time.

3. **Take advantage of the Supplemental Instruction (SI) resources.** Supplemental Instruction (SI) is offered for this course. SI sessions are group study opportunities, scheduled once a week. These sessions are facilitated by your SI Leader, who is attending class and preparing SI sessions based on the class content. Students should attend SI sessions to ask questions about course content and to develop learning/study strategies. Students who participate in SI sessions typically earn higher final course grades and exam grades than students who do not participate in SI. SI attendance is voluntary, and it is not a substitute for office hours, class attendance, or individual studying. For information about the days, times, and locations for SI sessions, please contact your SI Leader.

4. **Abide by collegiate standards.** Do not wait until the last minute to begin assignments. Past experience indicates that assignment quality, and therefore your grade, is lower when you procrastinate. No surprise, right? Writing is an iterative process. Spread it out over many days to a week. It is best if you write a draft, set it aside for a day or two without looking at it, and then come back to finish it. *Never* submit a first draft, and *never* submit something that you have not carefully and critically scrutinized first. Oh, and one more thing – incorporate my feedback from earlier assignments into future ones: I provide comments and suggestions for a reason ☺. If you find you need additional assistance with writing, CASA provides free tutoring at the Writing Center (by appointment: call the main desk at [508] 626-4509).

5. **Keep track of your grade**. It is, after all, *your grade.* Keep a log of your scores, and save all graded work. This will allow you to evaluate your standing at any time. Simply divide the points you've earned by the number of points assigned to date and multiply by 100%. Your final grade should never be a surprise.

6. **Be open-minded about learning and new experiences.** As a final comment, I observe that some students are initially anxious about taking this course because science is "out of their comfort zone." While it is true that the content and the format of assignments might be different from what you are used to, it should also be exciting and stimulating to be exposed to something different! I urge you to look about our classroom and you'll quickly discover that your peers collectively represent one of the most diverse groups (in terms of backgrounds and interests) you may encounter in a course at FSU. The course is designed and tailored specifically for such a group of non-science majors. Each of your peers will have different perspectives and ways of approaching things/problem solving – embrace this! I encourage you to begin the semester with an open mind and a desire to broaden your experience – this is, after all, what a college education is all about. Starting off the semester with the misconception that "you can't do science" will create a major mental roadblock to your success in this course. On the other hand, if you come in with an open mind and positive attitude, you may be pleasantly surprised! *Have fun and enjoy doing science!*

Lecture Schedule

Subject to change with advanced notice

Week	Lecture topic	Textbook readings
1	**Unit 1: Introduction** Scope of biology and major themes; The scientific process	Ch. 1
	Unit 2: Levels of organization I—cell structure and function Biochemistry: the chemistry of life; Cells	Ch. 2, 3
	Metabolism: capturing and releasing energy; Photosynthesis and cellular respiration	Ch. 4, 5
2	**Unit 3: Genetics—the blueprints for life** DNA and genes; Transcription and translation (making proteins); Mutation	Ch. 6, 7
	Mitosis and meiosis (cell reproduction); Inheritance patterns	Ch. 8, 9.1-9.5
3	Human genome and genetic disorders; Biotechnology: applied genetics; Introduction to evolution (after Exam 2)	Ch. 9.6-9.9, 10 Ch. 11.1-11.3 (after Exam 2)
	Unit 4: the diversity of life Evolution: evidence, processes and patterns	Ch. 11.4-11.7, 12
4	A brief history of life; Biodiversity of organisms: microbes to animals	Ch. 13, 14, 15
	Unit 5: Levels of organization II—organism structure and function (after Exam 3) Homeostasis; Animal structure and function	Ch. 19, 21 (after Exam 3)
	Animal structure and function; Nutrition	Ch. 20, 23
5	Disease and immunity; Cancer	Ch. 22, 8.1, 8.3
	Plant structure and function	Ch. 27, 28
	Unit 6: Levels of organization III—ecosystem structure and function (after Exam 4) Biomes	Ch. 18.1-18.4 (after Exam 4)
6	Ecology: populations, communities and ecosystems	Ch. 16, 17
	Environmental issues and global change; Conservation biology	Ch. 18.5-18.6
	Course synthesis/review	---