Energy in Living Systems Biology 115-01 Fall 2010

Professor: Drew Kerkhoff
Office: 301 Higley
Phone: X5734
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MWF, 8:10 am-9:00am, Higley Auditorium

Office Hours:
Monday 10-11 am
Wednesday 2-4 pm
Thursday 1-2 pm
Also By Appointment

Text: Freeman, Scott (2008) *Biological Science*, 3rd ed. Pearson/Prentice Hall, New York, NY. 1262pp. 4th ed. is also fine. Page numbers may vary…

Plus outside reading assignments linked to the course Moodle site.

Date		Subject	Readings
Aug.	27	Introduction to the class; What is Life?	Ch. 1
	30	Tree of Life: Prokaryote Structure and Diversity	Ch. 1, 28.1-28.3
Sept.	1	Energy	Ch. 2, 9.1
	3	Chemical Bonds, Atoms, Water	Ch. 2
	6	Amino Acids; Protein Structure and Function	Ch. 3
	8	Enzymes and Catalysis	Ch. 3
	10	Nucleic Acids and the RNA World	Ch. 4
	13	Lipids and Membranes	Ch. 6
	15	Cell Structure	Ch. 7
	17	Cellular Transport	Ch. 7
	20	Exam #1	
	22	Multicellularity; Cellular Specialization; Protist Diversity	Ch. 8.2, 29.3 pp. 603-612
Sept.	24	Carbohydrates; ATP	Ch. 5
	27	Overview of Energetics: Glycolysis	Ch. 9
	29	Glycolysis; The Krebs Cycle	Ch. 9
Oct.	1	Oxidative Phosphorylation	Ch. 9

	4	Photosynthesis: The Light Reactions	Ch. 10
	6	Photosynthesis: Calvin Cycle; C3 vs. C4 Plants	Ch. 10
	8	*October Break*	
	11	Plant Nutrition and Nitrogen Fixation	Ch 38
	13	Global Biogeochemical Cycles	Ch. 54.2
	15	Exam #2	
	18	Tissues Differentiation; Plant Structure and Diversity	pp. 626-640, 648-661; Ch. 36.1
	20	Sugar and Water Transport in Plants	Ch. 37
	22	Tissues and Organs; Structure and Function in Animals	Ch. 32.1-32.1, 41.2
	25	Animal Diversity	Ch. 32.3, 32.4
	27	Salt and Water Balance in Animals	Ch. 42.1-42.3
	29	Cellular Coordination: Signaling and Hormones	Ch. 8.2-8.3; 47.3-47.4
Nov.	1	Neurons and the Nervous System	Ch. 6.4, 45.1-45.3
	3	Nerves and Muscles	Ch. 46.5
	5	Sensory Systems and Behavior	Ch. 46.1-46.2, 51.3
	8	Integrative Paper:	
Nov.	10	Exam #3	
	12	Homeostasis: Thermoregulation	Ch. 41.4-41.5
	15	Physiological Ecology – from Organism to Ecosystem	Ch. 41.3
	17	Demography; Population Growth	Ch. 52.1
	19	Limits to Populations, Population Dynamics	Ch. 52.2-52.4
	20-28	**Thanksgiving Break**	
	29	Species Interactions; Community Structure	Ch. 53.1-53.2
Dec.	1	Community Dynamics	Ch. 53.3-53.4

	3	Energy Flow in Ecosystems	Ch. 54.1
	6	Human Impacts on Global Ecosystems	Ch. 54.3
	8	Biodiversity	Ch. 55.1-55.2
	10	Human Impacts on Global Biodiversity: Extinction and Species Conservation	Ch. 55.3-55.4
	13	Exam #4 and Comprehensive Final Exam **(6:30 pm)**	

N.B. This is a tentative outline of the topics. The most up-to-date version of the syllabus can always be found on the course Moodle site.

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About the Course: This course covers the study of life from the biochemical to the global levels, concentrating on the flow of energy and materials through organisms. The course is designed to introduce the students to the process of scientific thinking as well as to the principles of biochemistry, cell biology, physiology and ecology. We will discuss current research methods and approaches to unanswered questions.

This is one of the courses in Biology at the foundation level, the others being BIOL 109-110Y (Introduction to Experimental Biology) and BIOL116 (Information in Living Systems). There are NO prerequisites, and enrollment is open to both majors and non-majors.

NOTE: Although this section of BIOL 115 will cover the same materials as in Dr. Kathy Gillen's BIOL 115-02 section, we may do the topics in a different order or with a slightly different emphasis.

Additional Resources: The student website for the course at www.prenhall.com/freeman/biology may prove useful as it has self-assessment tools and additional information. Also, the CD that comes with the text has some good animations and assessment tools.

How to do well in this class:

- **Be Prepared and Engage in the Course**. Come to class prepared and ready to pay attention, and take thorough and detailed notes. Note that lecture material includes material ***not*** found in the reading, and the readings may not be covered completely in class. My expectation is that you will do the reading **before** class. Over the course of the semester, several unscheduled quizzes will be given to assess comprehension of the material from the text.

- **Participate and Ask Questions**. Any time in class - ask for clarification; pose a question; link disparate ideas together; draw on your own experience. I will call on people who are not participating. Outside of class, during office hours, after class, or via email, if you have a question, ask me. Note: I will not generally be reading email consistently after working hours, so don't expect a quick answer to a question emailed late in the evening.

Attendance: Class attendance is mandatory and unexcused absences will negatively affect your grade. To secure an excused absence, you must contact me (by phone or email) **before** you miss a class. **At the same time, if you are ill (especially exhibiting fever, soar throat and other flu symptoms) please do not come to class.** The germ theory of disease has significant scientific support…

If you are an athlete or a member of another organization that travels, it is **your responsibility** (not your coach's or advisor's) to make arrangements with me concerning missed classes **well in advance.** Failure to do so will result in unexcused absences. Coursework missed due to an excused absence must be made up in a timely fashion. In-class work missed due to an unexcused absence cannot be made up. The value of late assignments will "decay" at a rate 1/3 letter grade (~3.5%) per day.

Academic Honesty and Class Conduct: Plagiarism and other forms of academic dishonesty will not be tolerated. Please make sure that you have read carefully the Academic Honesty Guidelines in the 2009-2010 Course of Study, pp. 24-27. If you have any questions, please see me.

Grading:

4 Exams = 60% total
Comprehensive Final = 15%
Quizzes = 15% total
Class Participation/Attendance = 10%

Preliminary Exam Schedule (subject to change with sufficient notice)
1st Exam - Wednesday, 23 September
2nd Exam - Wednesday, 21 October
3rd Exam - Wednesday, 18 November
4th Exam (and Comprehensive Final)- Sunday, 20 December (6:30 pm)

Exam Reviews: I will share previous exam questions and will generally schedule a review session as well. Also, your lead tutor will be available to discuss exam questions at the MSSC.

Extra Credit: The biology department offers seminars throughout the semester. During seminars biologists share their current work and offer time at the end for questions. It can be quite exciting to listen to a good seminar and is a fantastic way for you to start getting involved in the department. Unlike a textbook or article, seminars are dynamic- it is like the difference between listening to a studio recorded CD or being at a live concert. You are encouraged to attend as many seminars as your schedule permits. You can earn extra credit towards the attendance and participation portion of your class grade for up to two seminars you attend**. Be sure to sign the attendance sheet that is passed around and by the class following the seminar (usually Friday) e-mail me a short, one paragraph summary**. Include in your summary what questions you still have, what you did and didn't understand, etc.

Math and Science Skills Center (MSSC): The MSSC is there for your use concerning your problems in math and the sciences. It is in 207 Tomsich and is available for your use during the semester 7-10pm on Sunday, Tuesday and Thursday. Keith Miller is lead tutor for both sections of Biology 115 this semester.

Learning Disabilities: If you have a hidden or visible disability that may require classroom or test accommodations, please see me **as soon as possible**. If you have not already done so, you must register with the Coordinator of Disability Services (Erin Salva, salvae@kenyon.edu, x5453), who is the individual responsible for coordinating accommodations and services for students with disabilities. All information and documentation of disability is strictly confidential. No accommodations will be granted in this course without notification from the Office of Disability Services.