Biological Concepts **Syllabus**
BOT/MBI/ZOO 116, section B **Spring 2008**
128 Pearson Hall **MWF 11:00-11:50pm**

Instructor Addresses:

Dr. D. Russell Zoology	office: 156 Pearson Hall phone: 529-3179	email: russeld@muohio.edu hours: W 3:00-4:00 & by appt
Dr. R. Meicenheimer Botany	office: 358 Pearson Hall phone: 529-4592	email: meicenrd@muohio.edu hours: M W 9:00-10:30 am & by appt.
Dr. G. Janssen Microbiology	office: 68 Pearson Hall phone: 529-1694	email: janssegr@muohio.edu hours: W 1:00-200 pm & by appt.

Lecture Schedule:

Date	Topic		Campbell *et al.*	Morris-Hooke
Week 1	---			
1-14	Methods and Concepts in Biology	ZOO	Ch. 1	
	I. Biological organization is based on fundamental laws of chemistry.			
	Chemical Context of Life	ZOO	Ch. 2,3	
	Carbon compounds in cells	ZOO	Ch. 4,5	
	Lab1. Cell Structure - Microscopy			
Week 2	---			
1-21	**No Class:** Martin Luther King Day			
1-23	Enzymes	ZOO	Ch. 5& 8, pp. 150-157	
	II. Cells are the basic unit of life.			
	Cell Structure and Function – An overview	ZOO	Ch. 6	
	Lab 2. Evaluating Information on Genetically Engineered Crops			
Week 3	---			
1-28	Membrane Structure and Function	ZOO	Ch. 7	
	III. The structure of genes and the way genetic information is encoded are fundamentally the same in all living organisms.			
	The Prokaryotic and Eukaryotic Conditions	MBI		Ch. 2
	DNA and the Gene	MBI	293-298; 359-364	
	Lab 3. DNA Fingerprinting			
Week 4	---			
2-4	DNA Replication	MBI	299-307; 374-381	
	Transcription: DNA Encodes RNA	MBI	309-319;364-369;352-356	
	Translation: RNA Encodes Protein	MBI	320-331;369-370	
	Lab 4: Microbial Metabolism			
Week 5	---			
2-11	**IV.Living Things utilize energy to maintain internal order and organization.**			
	Introduction to Metabolism	BOT	Ch. 8	
	Aerobic Respiration	BOT	Ch. 9	
	Aerobic Respiration	BOT	Ch. 9	
	Lab 5: Photosynthesis			
Week 6	---			
2-18	**No Class**: President's Day			
2-19	Photosynthesis Light Reaction	BOT	Ch. 10 (pp. 181-193)	
	Photosynthesis Carbon Fixation	BOT	Ch. 10 (pp. 193-200)	
	NO LAB this week			

Week 7			
2-25	**First Lecture Exam:** through photosynthesis		
	V. Organisms adapt to their environment through physiological mechanisms.		
	Bacterial Classification	MBI	Ch. 4, 5
	Bacterial Attachment and Movement	MBI	Ch. 6, 7
	Lab 6: Microbial Growth & Normal Flora.		
Week 8			
3-3	Bacterial Cell Growth and Development	MBI	Ch. 3
	Bacterial Cell Growth and Development	MBI	Ch. 8
	Bacterial Virulence	MBI	Ch. 8
	Lab 7. ***Midterm Lab Exam*** *and Plant seed for Lab 9.*		
Week 9			
3-10	Plant Cells and Plant Body (root/stem/leaf)	BOT	Ch. 6 (pp. 102-120); Ch 35 (pp.712-719); Ch. 38 (pp. 778-780)
	Primary and Secondary Plant Growth	BOT	Ch. 35 (pp. 720-737)
	Plant Mineral Nutrition and Transport	BOT	Ch. 36, 37
	Lab 8: Plant Cells and Simple Tissues		
Spring Break			
3-17	**No Class**: Spring Break (3-17 through 3-21)		
Week 10			
3-24	Plant Reproduction (sexual and asexual)	BOT	Ch. 38
	Plant Hormones	BOT	Ch. 39 (p. 788-801)
	Plant Responses to the Environment	BOT	Ch. 39 (p. 801-817)
	Lab 9: The Plant Body: Stems, Leaves and Roots		
Week 11			
3-31	**Second Lecture Exam:** bacterial classification through plant responses to the environment		
4-2	Homeostasis	ZOO	Ch. 40, 41 pp. 828-836; 844-846
	Information Flow and the Neuron	ZOO	Ch. 48, pp. 1011-1033
	Lab 10: Homeostasis		
Week 12			
4-7	Integration and Control: Nervous System	ZOO	Ch. 48, pp. 1011-1033
	Integration and Control: Endocrine System	ZOO	Ch. 45
	Endocrine System	ZOO	Ch. 45
	Lab 11: Vertebrate Anatomy		
Week 13			
4-14	Muscle Contraction	ZOO	Ch. 49, pp. 1066-1072
	Sensory Reception	ZOO	Ch. 49, pp. 1045-1053
	Sensory Reception	ZOO	Ch. 49, pp. 1045-1053
	Lab 12: Cardiovascular Anatomy and Physiology		
Week 14			
4-21	Circulatory System	ZOO	Ch. 42, pp. 867-884
	Circulatory System	ZOO	Ch. 42, pp. 867-884
	Respiration	ZOO	Ch. 42, pp. 886-893
	Lab 13: Animal Reproduction and Development		
Week 15			
	VI. Living organisms reproduce and develop through an ordered sequence of steps.		
4-28	Principles of Reproduction	ZOO	Ch. 46, pp. 964-982
	Principles of Reproduction	ZOO	Ch. 46, pp. 964-982
	Lab 14: ***Final Lab Exam***		
Finals Week			
5-9	**Final Exam:** at 12:30 pm - covers Homeostasis through Development, plus synthesis of material from the entire course.		

Textbooks:

The primary text is *Biology* (7th edition) by Neil A. Campbell and Jane B. Reece which should be shrink-wrapped with a CD-ROM to accompany *Biology*. You will need to purchase *Basic Microbiology for Biological Concepts* by Anne Morris-Hooke and *Laboratory Experiences for Biological Concepts* by DeVille, Morris-Hooke, Solomon and Wilson, both available at the Shriver Center bookstore.

Grading System:

Lecture quizzes and assignments	200 points [50 pt. BOT; 50 pt. MBI; 100 pt. ZOO]
Exam 1	150
Exam 2	150
Final Exam	250
Laboratory***	250
TOTAL:	**1000 points**

*****Note: You must pass the laboratory section (with at least 150 points) in order to pass the course.*****

Examination Schedule:

Examination 1: Mon, February 25, 2008 (through photosynthesis)
Examination 2: Mon, March 31, 2008 (bacterial classification through plant responses to environment)
Final Exam: Fri, May 9, 2008 at 12:30 pm (over last 13 lectures **PLUS** synthesis of the rest of the course)

NOTE: NO early final exams will be given! This is a University policy; please do not ask.

Exams and Written Assignments:

The exams will be a mixture of various types of multiple-choice questions. More information will be provided before the first exam. In addition, there may be unannounced "pop" quizzes given between each of the lecture examinations. Thus, you should attend every class and come prepared. Quizzes will consist of short-answer essay and/or objective questions. There will be some additional assignments made from time to time in lecture. These will be announced by your instructors and may involve some additional readings and/or short written assignments. All lab assignments (paper copy) are due at the beginning of the next laboratory.

NO make-up exams or quizzes will be given unless the student has a valid excuse for the absence.

Attendance:

"Every student is expected to attend every class session for which the student is duly registered" (Student Handbook, sec. 701). Oversleeping or studying for other classes are not acceptable excuses for missing class or an examination.

Academic Dishonesty:

Academic dishonesty will **not be tolerated**. See the statements in the Student Handbook concerning academic dishonesty. As stated in the student handbook, students are expected to behave honestly in their learning because any form of cheating undermines the value of a Miami education for everyone. You are responsible for knowing Miami University's policy concerning academic dishonesty. Penalties will be enforced in accordance with the regulations as stated in the student handbook and range from grade reduction to suspension, dismissal or expulsion from the university. A lack of familiarity with Miami's policy or misunderstanding of what is considered appropriated and honest conduct will not be accepted as an excuse.

In particular, cheating on exams or on any written work will not be tolerated. Any written work that is handed in with your name on it must be your own original work. Plagiarism, submitting work purported to be your own where the ideas or wording are from another person or source (*e.g.*, another book or someone's reports or the World Wide Web), will not be tolerated. The minimum penalty for a first offense will be a zero in that portion of the course, in accordance with Miami's policy (see Student Handbook). While it is fine to discuss things with your lab mates, you should go into another room and compose and write your assignments or lab reports by yourself. If you and another student hand in work that is virtually identical (*i.e.*, contains identical or almost identical sentences or has all the same ideas expressed in the same order), that is not original work and handing it in with your name on it is dishonest and against Miami's policy. Moreover, if another student allows you to use his or her work, that student will also be guilty of academic dishonesty. Again, saying that you did not understand the definition of plagiarism or Miami University's policy on academic honesty is no excuse.

We are **required** to treat plagiarism and other forms of academic dishonesty in a formal manner. The details of the procedures are provided in the student handbook; please see: http://www.miami.muohio.edu/documents_and_policies/handbook/academic_regulations/acadregspv.cfm

NOTE: During class time, cell phones cannot be used, answered, or within sight. Shut the phone off and either put cell phones in a coat pocket or book bag or do not bring the phone to the lab or lecture. If a cell phone is utilized any manner during a lab or lecture examination, the examination will be collected immediately and examination result will be recorded as a **ZERO**. **Laptop computers** may be used in class for **class purposes ONLY**. This includes viewing and taking notes. Laptops may NOT be used for other purposes (surfing the internet, e-mailing friends, watching videos, playing solitaire, etc.). Such un-authorized use is disruptive to your class mates and to you!

It is impossible to cover every topic mentioned in lecture in the laboratory. The best we can hope to do is to illustrate some of the main concepts, and to provide you with first-hand experience with manipulation of laboratory materials and equipment. We try to use and have available, live organisms whenever possible, but this is subject to availability from various suppliers, and will vary from year to year.

Laboratory: **NOTE: The laboratory IS mandatory!**

You **must** attend your assigned laboratory section. Attendance will be taken in laboratory sections during the first five minutes of the class and each unexcused absence will result in a 5-point reduction from the cumulative score. We expect that you will be on time for lab sections; excessive tardiness will result in being marked absent. Credit for make-up labs will **only** be given to those with a written medical excuse (on physician's letterhead stationery) or a family emergency such as a death of a family member (letter from a parent with their phone number required) and the excuse **must** be turned into Dr. Steinly within two weeks of your absence for you to get credit. If you are unable to attend lab on a particular week, you **must** contact Dr. Steinly **immediately** (before the scheduled laboratory) to schedule a make-up lab. Labs **must** be made-up during the week that they are scheduled. It is **your responsibility** to make sure that you contact Dr. Steinly. Speaking to the TA in charge of laboratory section is not sufficient: he or she is not able to reschedule you to make up the lab exercise you missed. Make sure that you are aware of Dr. Steinly's office number, email, and phone number (108 Pearson Hall; steinlba@muohio.edu; 9-5732) in case of illness or family emergency.

A number of laboratory exercises will be followed by written assignments. Turning in an assignment after the due date will result in loss of credit for each day that the assignment is late. Weekends are **not** exempt for this rule. Except where otherwise noted, each student will write his/her assignments independently. You **must** use your own results in laboratory write-ups unless instructed to use class data. In order to use your own data, you must be present when the data is collected. Therefore, TA's will not accept written work from students that were absent from the lab in which the experiment was conducted. Unexcused absences or failure to contact Dr. Steinly and make up the lab will result in a zero for the assignment for the lab missed.

The laboratory (Room 121 Pearson Hall) will be open on Thursday evenings from 5:00 to 7:00 PM for students wishing to do additional or review work. A teaching assistant will wait until 6:00 PM and if no students show up by that time, he or she is free to leave. This time is not intended to be used to make-up labs.

Resources:

Additional assigned readings will be on electronic reserve. These materials will include the criteria for grading laboratory reports and the total number of points assigned for each section of the report. To access electronic reserve go to Miami University Home page and click on libraries. On the page that come up on the screen click "Reserves"; next page pull down menu to BMZ 116 and click on the go button. Select an assignment or item by clicking on a title in the list that is presented. The next page will ask for a password and that password is Solomon. Now you are free to examine the content of the selected item. Additional material may be put on reserve at the reserve desk at Brill Science Library in Hughes Hall. Statistical software will be on reserve in the Arts and Science Computer Lab (Upham Hall) and other sites listed by your instructors.

This course uses 'Blackboard' at Miami's website <http://blackboard.muohio.edu> for the distribution of some course materials. Every student can log into the site using his/her Miami ID and password. These resources can include student grades, homework assignments, this syllabus, and other material that may be announced during classes. Also provided are printable text versions of lecture notes, and review copies of the PowerPoint presentations. It is strongly

suggested that you print and bring the lecture notes to the lectures. Botany PowerPoint presentations with working animations can be downloaded from:

http://www.cas.muohio.edu/~meicenrd/BMZ116/TBMZ116.htm

COURSE OVERVIEW

The second semester begins with the study of biological chemistry followed by discussion on cells and organelles, a concept that unifies the three life sciences. Following an introduction to the cell, you will be introduced to molecular biology. Here the unifying principles of living systems are developed further. From the unit on molecular biology, we will continue to discuss unifying principles; this section begins our lectures on cell physiology. The material on cellular anatomy and physiology will conclude with lectures on bacterial physiology. Laboratory exercises coordinated with this material will demonstrate to the students some of the current technology. The final lecture in this unit will be on genetic engineering and biotechnology to allow the students to see the practical applications of these principles. After learning about physiology on a cellular level, we first turn to plants and then animals to demonstrate from a mechanistic point of view how organisms respond and adapt to the environment.

When possible we will present the historical foundation for basic biological principles, including the hallmarks and scientist(s) responsible for these achievements. Reference to major societal issues such as uses of genetic engineering and AIDS are included in lectures when possible to make the application of biological principles meaningful to students.

Laboratory exercises are coordinated with lecture material so students will gain hands on experience with some of the principles discussed in lecture. Our approach includes labs in which students engage in cooperative learning through group effort. We have incorporated labs that show students useful technology such as DNA isolation and electrophoresis.