Biological Concepts **Syllabus**
BOT/MBI/ZOO 116, section B **Spring 2009**
128 Pearson Hall **MWF 11:00-11:50 am**

Instructor Addresses:

Dr. D. Russell Zoology	office:156 Pearson Hall phone:529-3179	email: russeld@muohio.edu hours: W-F 3-4 pm; & by appt.
Dr. R. Meicenheimer Botany	office:358 Pearson Hall phone:529-7012	email: meicenrd@muohio.edu hours: M W 9-11am & by appt.
Dr. G. Janssen Microbiology	office: 68 Pearson Hall phone: 529-1694	email: janssegr@muohio.edu hours: T R, 9-11 a.m. & by appt

REQUIRED MATERIALS:

- ***Biology*** (1st edition) by Brooker, Widmaier, Graham, and Stiling
- ***Laboratory Experiences for Biological Concepts*** by Gregg, Hooke, Solomon, and Steinly, available at the Shriver Center bookstore.
- ***A "TURNING POINT" personal response device***, available at Shriver Center bookstore.

FOR SECTION CHANGES AND COURSE DROPS/ADDS:

See Joni Robinson, 212 Pearson, phone 529-3103

RESOURCES:

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 PowerPoints with Flash animations and Study Guides can be downloaded from: http://www.cas.muohio.edu/~meicenrd/BMZ116/TBMZ116.htm

COURSE OVERVIEW:

The semester begins with the study of biological chemistry, followed by discussion of 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. After discussing physiology on a cellular level, we 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 scientists 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.

GRADING SYSTEM:

Lecture quizzes and assignments	200 points [BOT, 67; MBI, 67; ZOO, 66]
Exam 1	150
Exam 2	150
Final Exam	250
Laboratory***	250
TOTAL:	**1000 points**

*** Note: The point values in the laboratory manual are on a different scale. You **must** pass the laboratory section (with at least 150 points out of 250) in order to pass the course. See below for more information.***

EXAMINATION SCHEDULE:

EXAMINATION 1: Friday February 20
EXAMINATION 2: Friday April 3
FINAL EXAM: Monday, May 4 at 2:45 am

NOTE: NO early final exams will be given. We will not give the exam early because you made conflicting travel arrangements. Please do not ask.

EXAMS, QUIZZES, AND WRITTEN ASSIGNMENTS:

Exams will consist of 50 multiple choice questions each (except the final, which is 75 questions). In addition, there will be unannounced ("pop") quizzes given between each of the lecture examinations. Quizzes will be short-answer, multiple choice, and/or true/false questions. **Thus, you should attend every class and come prepared.** 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. For your final grade, the University grading scale will be followed. There are no (+) or (-) grades given in this class.

- NO make-up exams will be given unless the student has a valid excuse (e.g., family emergency, medical emergency, etc) for the absence. This excuse MUST be documented and we will ask to see this documentation. The University Health Center does not give medical excuses to students under normal circumstances; however, they should be contacted about medical/family situations and then will contact your professors (529-3051). Please inform the instructors if you have a

circumstance arise that may affect your performance on an exam – we will confer and make a decision about your status.

- If you are going to miss an exam for a valid reason, you **must** contact one of the instructors prior to the start of the exam. Send one of us an e-mail, call, or leave a note on our door, and make sure you include your e-mail **and** a phone number where we can contact you.
- Make-up exams may be different from the regular exam in terms of content and/or format.

ATTENDANCE:

"Every student is expected to attend every class session for which the student is duly registered" (Student Handbook, sec. 701). **You** are responsible for attending lecture during which a quiz or written assignment may be given. Oversleeping or studying for other classes are not acceptable excuses for missing class.

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 reductions to suspension, dismissal or expulsion from the university. A lack of familiarity with Miami's policy or misunderstanding of what is considered appropriate and honest conduct will not be accepted as an excuse.

In particular, we **will not tolerate** cheating on exams or on any written work. 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 report) 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 write out 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

TECHNOLOGY:

Cell phones and electronic devices must be turned off during lecture. **Cell phones may not be used**, answered, or within sight during examinations. **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 examination. 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. The same policy applies to other electronic devices such as beepers and iPods and other MP3 players. 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, etc.). Such unauthorized use is disruptive to your classmates and to you! Students who use laptop computers for unauthorized purposes will be asked to turn them off.

LABORATORY:

Your TA will go over the grading system with you during your first lab meeting. Briefly, the lab will consist of 50 points for the mid-term exam, 50 points for the final exam, 200 points for the field and lab reports, quizzes and pre-lab assignments. The laboratory grade will account for 25% of your final grade in BMZ 116. However, the laboratory is based on a 300-point system, so in order to accurately estimate your final grade, you must convert the lab grade to calculate your final grade:
(Total points earned in lab/300 points assigned)(250) = Points earned toward final BMZ 116 grade

YOU MUST PASS LAB TO PASS THE COURSE.
Even if you get an "A" in lecture, if you fail lab, you get an "F" in the course!

The labs are designed to illustrate some of the main concepts and to provide you with first-hand experience with manipulation of laboratory material and equipment.

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 deduction 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 (doctor's note on letterhead stationery) or a family emergency such as the death of a family member (letter from a parent with daytime phone number is required) and the excuse **must** be turned into Dr. Bruce Steinly (108 Pearson, steinlba@muohio.edu, phone 529-5732) 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** to schedule a make-up lab. Labs **must** be made up during the week they are scheduled. It is **your responsibility** to make sure you contact Dr. Steinly; speaking to the TA in charge of your laboratory section is not sufficient; he or she cannot schedule the make-up for you.

There are pre-lab assignments for a number of laboratory exercises. These are due at the beginning of lab. Late pre-labs will result in a zero. A number of the 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 from this rule. Except where otherwise noted, each student

will write his or 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 are collected. The TAs will not, therefore, accept written work from students who 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.

There are traditionally open lab hours on Thursday evenings from 5 to 7 PM in 121 Pearson for students wishing to do additional or review work. This time is **NOT** intended to be used for make-up labs. **NOTE:** The lab will close at 6:00 PM if no students have arrived by then. Please ask your TA about this.

CONTACTING YOUR INSTRUCTORS:

- Please tell us your name, class and section number.
- In general, for questions about lecture, see the instructor who gave that lecture. However, feel free to come see any of us with any questions you have.
- When you e-mail us, please **use your muohio account**, as spam filters may prevent us from getting messages from other services. Also, include "BMZ 116" in the subject line.
- We are all happy to answer your e-mail questions, but please bear in mind that once we leave the office we might not check our e-mail until the following work day. Please do not send us an e-mail at 7 PM and expect a reply before class the next day.
- Also, if you send an e-mail to us regarding an issue or excuse, please check often for our reply about how to resolve the situation. Merely sending an excuse is not enough.

MIAMI PLAN INFORMATION:

PURPOSE: The diverse educational communities of a comprehensive university have a common interest in liberal learning: it nurtures capabilities for creatively transforming human culture and complements specialized work by enlarging one's personal and vocational pathways. Liberal education involves thinking critically, understanding contexts, engaging with other learners reflecting and acting, habits that extend liberal learning through a lifetime to benefit both the individual and society.

THINKING CRITICALLY: Thinking critically promotes imagination and intuition along with reasoning and evaluation. These diverse abilities contribute to achieving perspective, constructing and discerning relationships, and gaining understanding. Confidence in working with data and materials, skepticism in analyzing arguments or presentations, persistence in engaging complex problems and facility in communicating about technical matters are central to thinking critically. A skillful use of written and spoken languages, and informed use of mathematics and an ability to employ contemporary information sources are integral to thinking critically.

UNDERSTANDING CONTEXTS: Liberal learning cultivates the perspective that present cultural circumstances are an historical and a changing situation. Decisions about what is to be studied, the forms in which knowledge appears and the ways reasoning develops are to be continually examined. Ways of knowing need active attention: gender, class, racial identity, ethnicity, economic status and regional identity condition our understanding; temporal and spatial relationships, institutional traditions, religious commitments, philosophic perspectives, and political objectives shape our assumptions; influences originating beyond geographic and social boundaries affect what we know. Crucial to our future is knowledge of the conceptual frameworks and achievements of the arts, sciences, and technology, as well as understanding of the earth's ecosystem and the character of global society.

ENGAGING WITH OTHER LEARNERS: A healthy exchange of conflicting ideas and differing viewpoints encourages rethinking of accepted perspectives; it requires making choices and taking risks. Diversity among learners, a supportive atmosphere of group work, active listening, opportunities for presenting and criticizing the results of inquiry and creative effort encourage learning, aid growth and stimulate imagination. Thoughtful and systematic inquiry about the learning process supports shared efforts, and positive advising situations and experiences outside the classroom reinforce them.

REFLECTING AND ACTING: Thinking critically and understanding contexts for knowledge in an engaging learning situation lead to reflection and informed action. Making thoughtful decisions and examining their consequences enhance personal moral commitment, enrich ethical understanding, and strengthen civic participation.

BMZ 116 is part of the Miami Plan Foundation IV. Natural Science (9 hours, must include one laboratory course). Other courses that may be used to fulfill this sequence:

IVA. Biological Science (3 hours minimum)
BOT/MBI/ZOO 115 (4) LAB; BOT 131 (3) ; BOT 155 (3) LAB; BOT 171 (3) ; BOT 191 (4) LAB; MBI 111 (3); MBI 121 (3); MBI 123 (1) LAB; MBI 131 (2); MBI 143 (1) LAB; MBI 161 (4) LAB; WCP 121 (3) LA.; WCP 221 (4) LAB; ZOO 113 (4) LAB; ZOO 114 (4) LAB; ZOO 121 (3); ZOO 161 (4) LAB; ZOO 171 (4) LAB

IVB. Physical Science (3 hours minimum)
AER 101 (3) ; AER/PHY 118 (3); CHM 111 (4) LAB; CHM 131 (4) LAB; CHM 137 (4); CHM 141, 144 (3, 2) LAB; CHM 141.M (3); CHM 153 (2) LAB; EDT 181, 182 (4, 4) LAB; GEO 121 (4) LAB; GLG 111 (3) H; GLG 115.L (1) LAB; GLG 121 (3); GLG 141 (3); PHY 101 (3); PHY 103 (1) LAB; PHY 111 (3) H; PHY 121 (3); PHY 131 (3); PHY 141 (3); PHY 181, 182 (4, 4); PHY 183, 184 (1, 1) LAB; WCP 122 (3) LAB

OTHER RESOURCES ON CAMPUS:

SUPPLEMENTAL INSTRUCTION (SI): SI is an academic support program of student facilitated study sessions. SI study sessions are regularly scheduled, out-of-class times for students to review material and practice course content. Sessions are facilitated by SI

Leaders, students who did well in the course when they took it. More information about the details of SI will be announced on the first day of class. All students are encouraged to attend SI sessions regularly because it is an excellent way to improve your understanding of information and improve your course grade.

RINELLA LEARNING CENTER (phone number: 529-8741): The Rinella Learning Center provides tutors and assistance to any student who needs help. They also provide seminar and classes and skills you need to succeed in your courses such as note-taking, test-taking, and study skills. They also house disability services, where you can find out if you qualify for time and a half on exams.

OTHER: Hefner Museum, 106 Upham; Geology Museum, Gaskill Hall; Botany Greenhouse, Pearson Hall, Top Floor; Reserve List at Circulation Desk, Brill Science Library

BMZ 116 Sec B Course Schedule Spring 2009

Week 1	I. Biological chemistry		
Jan 12	m	1) Introductory material and announcements/ Atoms, molecules and water	Ch. 2
14	m	2) Organic molecules	Ch. 3, pp. 41-50
16	m	3) Biological macromolecules: protein and nucleic acid	Ch. 3, pp. 50-9;
		No Lab	
Week 2	II. Cellularity and cell-level processes		
19		Holiday-No Class	
21	m	1) Cells and membranes	Ch. 4; Ch. 5
23	m	2) Cell organization	Ch. 6, pp. 105-16; supplement
		Lab 1. Cell and Tissues	
Week 3			
26	z	1) Signaling and second messengers	Ch. 9, pp. 171-82
28	z	2) Cell adherence, multicellularity, and movement	Ch. 10; supplement
30	z	3) Cell division and growth	supplement
		Lab 2. Microbial Metabolism	
Week 4	III. Metabolism		
Feb 2	b	1) Enzymes and thermodynamics	Ch. 7, pp. 125-34
4	b	2) Glycolysis and fermentation	Ch. 7, pp. 134-6, 144-8
6	b	3) Citric Acid cycle	Ch. 7, pp. 136-145
		Lab 3. Bacterial Growth and Normal Flora	
Week 5			
9	b	1) Aerobic respiration	Ch. 7, pp. 134-148
11	b	2) Photosynthesis: light reactions	Ch. 8, pp. 151-61
13	b	3) Photosynthesis: Calvin-Benson cycle	Ch. 8, pp. 162-8
		Lab 4. Photosynthesis	
Week 6			

16	m	1) Special features of prokaryotic metabolism	Ch. 27, pp. 571-5; supplement
	IV. Information flow		
18	m	2) DNA replication I	Ch. 11, pp. 209-19
20		**3) EXAM 1 (through special features)**	
		Lab 5. DNA Fingerprinting	
Week 7			
23	m	1) DNA replication II and genomics	Ch. 11, pp. 219-28; Ch. 21
25	m	2) Transcription	Ch. 12, pp. 231-44
27	m	3) Translation	Ch. 12, pp. 245-53
		Lab 6. Genetically Engineered Crops	
Week 8			
March 2	m	1) Regulation of gene expression	Ch. 13, pp. 255-67
4	m	2) Viruses	Ch. 18, pp. 376-88
	V. Organismal biology		
6	m	3) Microbial communities	supplement
		Lab Exam 1 followed by Lab 7. Seed Planting	
Week 9			
9-13		**Spring Break**	
Week 10			
16	m	1) Microbes and health and disease	supplement
18	b	2) Plant hormones	Ch. 36, pp. 765-73
20	b	3) Plant organs	Ch. 35, pp. 743-50 Ch 39, pp. 839-843
		Lab 8. Plant Cells and Simple Tissues	
Week 11			
23	b	1) Plant tissues	Ch. 35, pp. 750-762
25	b	2) Plant responses to the environment	Ch. 36, pp. 773-82
27	b	3) Plant nutrition	Ch. 37
		Lab 9. The Plant Body: Stems, Leaves, and Roots	
Week 12			
30	b	1) Plant transport	Ch. 38
April 1	b	2) Plant reproduction	Ch. 39
3		**3) EXAM 2 (through plant transport)**	
		Lab 10. Homeostasis	
Week 13			
6	z	1) Homeostasis	Ch. 40, pp 856-859
8	z	2) Salt/water balance and excretory system	Ch. 49
10	z	3) Excretory system	Ch. 49
		Lab 11. Vertebrate Anatomy	
Week 14			
13	z	1) Animal transport: circulatory system I	Ch. 47
15	z	2) Animal transport: circulatory system II	Ch. 47
17	z	3) Animal transport: respiratory system	Ch. 48

		Lab 12. Cardiovascular Anatomy and Physiology	
Week 15			
20	z	1) Nervous system I	Ch. 43
22	z	2) Nervous system II	Ch. 43
24	z	3) Endocrine systems I	Ch. 50
		Lab 13. Animal Reproduction and Development	
Week 16			
27	z	1) Endocrine systems II	Ch. 50
29	z	2) Animal reproduction I	Ch. 51
May 1	z	3) Animal reproduction II	Ch. 51
		Lab Exam 2	
	Finals Week		
Final	**Sec B**	**2:45 on Monday May 4**	