



Fundamentals of Life Science II
The University of Toledo
College of Natural Sciences and Math
BIOL2170-001 CRN 12243

Instructor:	Dr. Brenda Leady	Term:	Spring 2015
Email:	Brenda.leady@utoledo.edu	Class Location/Times:	SM2110 M-R 8-8:50am
Office Hours:	M/W 2-3:30pm T/Th 1-2:30pm	Credit Hours:	4.0
Office Location:	WO1217		
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COURSE/ CATALOG DESCRIPTION

A general introduction to cell structure and function, energy processing in plants and animals, basic genetics, molecular biology and development.

STUDENT LEARNING OUTCOMES (from OTM TAG)

Scientific theory

1. Illustrate the scientific method through analysis of major biological discoveries.
2. Characterize the scientific method and its limitations in the search for answers to biological questions.

Life processes in living systems including organization of matter and energy

3. Demonstrate understanding of basic atomic structure and how atoms combine to form molecules.
4. Understand that the characteristics of life result from unique combinations that occur among a relatively small number of common atoms.
5. Understand the unique properties of the carbon atom, why it is important to life and the basic ways in which organic molecules are constructed.
6. Know the basic chemical and physical properties of water and how they facilitate processes essential for life.
7. Know the basic structural characteristics and biological importance of carbohydrates, lipids, proteins and nucleic acids.
8. Apply chemical principles to the analysis of structure and function of biological macromolecules.
9. Understand the relationship of chemical processes to the cellular processes of life.

General concepts of genetics and heredity

12. Recognize that unity and diversity of life on earth are a result of genetic inheritance through DNA and evolution by natural selection.
13. Understand DNA and its role in heredity, and how information from DNA is expressed in cells, and ultimately, the organism.
14. Compare mechanisms of regulation of gene expression.
15. Understand the structure, function and reproduction of cells, including viruses and microorganisms.
16. Understand the major steps in a typical eukaryote cell cycle including the details of mitosis and cytokinesis.
17. Understand the stages of meiosis, their significance, and how meiosis relates to sexual life cycles.
18. Understand different types of mutations and their effects on gene products and on phenotype.
19. Understand the basic principles of development.

Regulation of biological systems including homeostatic mechanisms

20. Understand that cells have evolved elaborate mechanisms for communicating and coordinating their functions in a living organism.
21. Recognize that regulatory mechanisms ensure balance in living systems and that organisms interact continuously with their environments; compare regulatory mechanisms within and across species
22. Apply knowledge of cellular regulatory mechanisms to explanations of aberrant cell behavior.



Bioenergetics including major biochemical pathways

23. Understand that living organisms harvest energy by breaking the chemical bonds of organic molecules through sequences of enzyme mediated reactions.
24. Understand the process of energy transfer from its source (the sun) through biological systems.
25. Understand the overall organization of the chemical pathways involved in cellular respiration and fermentation and how these pathways accomplish the processing of energy.
26. Understand current models of cell membrane structure and function.
27. Understand the overall organization of the chemical pathways involved in photosynthesis and how these pathways accomplish the conversion of light energy into chemical bond energy.

Historical development and perspectives in biology

28. Understand historical developments and perspectives in biology, including contributions of significant figures and underrepresented groups, and the evolution of theories in biology.

Applications of biology and biotechnology in society, business, industry, and health fields

32. Understand the uses of recombinant DNA technologies and genomics.
33. Integrate and relate knowledge learned from classroom with real life situations.

TEACHING STRATEGIES

It is expected that the reason you are taking this course is that you want to learn. The best way to succeed is to *read* the text, *attend* the lectures, and work the *study* questions. It is extremely helpful to read the text *before* attending the lecture. When you come to class it is expected that the focus of your attention will be on what is discussed in class, not social media, or homework for other classes. I encourage you to attend the lectures, in class I will outline and illustrate the course topics. The class also provides an opportunity for you to ask questions about the topics as they are being discussed, and helps me know when you are having difficulties with the material. Clicker questions are only in-class. What is discussed in class is *much* more likely to appear on an exam than material that is not. If the material is unclear or confusing, I encourage you to ask questions. If you are having difficulties with the material talk to me directly after class, during office hours, via email or phone. My goal is to help you succeed in learning.

PREREQUISITES

Undergraduate level CHEM 1090 Minimum Grade of D- or Undergraduate level CHEM 1230 Minimum Grade of D- or Undergraduate level BIOL 2150 Minimum Grade of D- or Chemistry Placement 20

REQUIRED TEXTS AND ANCILLARY MATERIALS

Morris, JR, DL Hartl, AH Knoll, RA Lue, A Berry, A Biewener, and B Farrell. 2013. *Biology: How Life Works*, 1st edition. *et al.* *Biology: How Life Works*, WH Freeman

ONE of the following

- o Loose leaf book with access to LaunchPad 9781464138256
- o Volume 1 with access to Launchpad 9781464142109
- o E-book with access to Launchpad 9781464104312

Turning Technology's Response Card RF either 9781934931691 or 9781934931684

TECHNOLOGY REQUIREMENTS

Turning Technology's Response Card RF either 9781934931691 or 9781934931684

Adobe Acrobat Reader

BlackBoard access

UNIVERSITY POLICIES

Policy Statement on Non-Discrimination on the basis of Disability (ADA) The University is an equal opportunity educational institution. Please read [The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.](#)



Academic Accommodations

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the [Student Disability Services Office](#).)

COURSE EXPECTATIONS

The following rules apply to all the exams and classes of this course:

1. I expect your full attention in class. When you are in class, you are there to pay attention and participate. Phones, iPods, pagers are turned off and ear buds are out. If you have an important call, take it outside the classroom with a minimum of disruption.
2. Examinations start and end at specified times. Under no circumstances will students be admitted to an exam after the first person has left the exam. *Additional time will not be given to students who come late to an exam.*
3. Be sure to bring two number 2 (#2) pencils, an eraser, and your valid UT student ID card to an examination.
4. All the examinations must be taken at the scheduled time. Missed exams can be made up as an essay exam covering the same material.
5. Please be considerate of your fellow students. During the time of an examination, quiet is to be maintained at all times. To be fair to everyone, I expect cell phones, pagers, iPods, etc. to be turned OFF and out of sight. Earbuds are to be removed. Anyone found looking at a digital device during an exam will be given an F in the course for academic dishonesty.
6. If the University is closed on a day scheduled for a test, your test will be given during the next time class is held.
7. I will post an answer key to check your bubble sheets. Errors in grading should be brought to my attention within one week of the time you receive your corrected examination. I do not allow you to keep the actual exam questions but you may make an appointment to look over missed questions.
8. If you have documentation from the Office of Student Disability Services, please see me before the first test to schedule your exams. Extended time is not given during the regular in class exams.

Academic dishonesty is a serious topic at the University of Toledo. The department policy on academic dishonesty is attached to the end of this syllabus.

GRADING

Clickers: DEADLINE TO BE REGISTERED IS January 18 at Noon

We will use Turning Technologies Response Card RF in class every day. I will ask several questions during the class period. A correct response is worth 1 point. An incorrect response is worth 0.5 points. I will take the final possible point total and adjust it by 15% to take into account missed classes or missed questions. There are no excused absences unless it is a several day absence with a medical excuse. The final point total will be 5% of the class grade. For example, if we accumulate 188 clicker points total. I drop that 15% so that 159.8 is a perfect score. Anyone over 159.8 does not get extra points. If you had 148 points that is $148/159.8 = 0.93 \times 5\% = 4.7\%$ for your clicker part of the final grade. Register your clicker on our Black Board site. Carrying a clicker for a student who is absent with the intent to give the absent student points, is academic dishonesty. Both students (the present student with 2 clickers and the absent student) will receive a 0 for all clicker points for the term for academic dishonesty.

Homework

Athletes practice on a regular basis to train their muscles. They don't go into an event without hours of practice spread over weeks. For you to do well in biology, you can't cram the night before and expect to do well. You need to practice. Homework is practice for thinking like a biologist.

You will complete online homework assignments (LaunchPad) for 5% of your grade.

There are 2 types of assignments.

- First, you will have a "Pre-lecture" assignment due for each chapter. These are Learning Curve activities. Read the text book first to become familiar with the material. The estimate is 20 questions to reach the Target Activity Score and then you get full credit. Most students



will not answer every question perfectly the first time, so you will likely have more questions to answer to reach the Target Activity Score and get full credit. You will need to start this a day or so before the due date to have enough time to read, think, and complete the assignment. I want you to be familiar with the material BEFORE I cover it in lecture. My discussion of the material will make much more sense if you are familiar with the material already.

- These are due at **8am** the day of lecture.
- You can go back to Learning Curve to help you study for exams.
- Second, “Post-lecture” homework is due after we complete a chapter. These are more difficult questions requiring more thought and effort. These questions are more similar to exam questions. We will discuss the results in class.
 - Due at 8am on various dates as we finish chapters.

Regular Exams:

4 multiple choice regular exams will be given. These exams are 50 multiple choice questions each worth 2 points. They will not be comprehensive but some concepts carry over from one exam to the next. Exams end at the end of the class period. If you arrive late, the exam is still due at the end of the class period. If you come in after the first person has left the exam, you will take the essay exam at a later time.

Exams taken at any time other than your regularly scheduled class time (early or late) are in essay format. Ten (10) essay questions will cover the same material as the exam. Contact your instructor to set up a time and place for an essay exam.

Final Exam:

The final exam is comprehensive. The final will consist of 100 multiple choice questions covering the entire semester. Each question is worth 2 points.

Clickers	5%
Homework	5%
Regular exams	70%
Final exam	20%
	100%

Final grades will be determined based on the following scale.

Grade	% Correct
A	90-100
A-	87-89
B+	83-86
B	79-82
B-	75-78
C+	71-74

Grade	% Correct
C	70-67
C-	66-63
D+	62-59
D	58-55
D-	54-51
F	50-0

Other notes:

If you stop coming to class, you will receive an F unless you

- Drop the class by January 26
- Withdraw from the class at the registrar’s office by March 27

The grade of **Incomplete (IN)** is assigned only in extraordinary cases when unexpected conditions prevent the student from completing the requirements of the course within the term of enrollment. In order to receive an IN you must be passing the course and make arrangements with me to complete your work.



COURSE SCHEDULE

Week	Date		Pre-Lecture Homework	Post Lecture Homework	Reminders
1	January 12	Introduction			
	January 13	<i>Chapter 1: Introduction: Life</i>			
	January 14			Due 8am Jan 20*	January 18 Noon clicker registration deadline
	January 15	<i>Chapter 2: Molecules of life</i>	Due 8am Jan 20*		
January 19	MLK Day – no class				
January 20			Due 8am Jan 20		
2	January 21	<i>Chapter 3: Nucleic acids and the encoding of biological information</i>	Due 8am Jan 21		
	January 22				
	January 26			Due 8am Jan 26	drop deadline
	January 27	<i>Chapter 4: Translation and protein structure</i>	Due 8am Jan 27		
3	January 28				
	January 29			Due 8am Jan 29	
	February 2	Exam 1 (Ch. 1-4)			
	February 3	<i>Chapter 5: Organizing principles</i>	Due 8am Feb 3		
4	February 4				
	February 5			Due 8am Feb 8	
	February 9	<i>Chapter 6: Making life work</i>	Due 8am Feb 9		
	February 10				
5	February 11				
	February 12			Due 8am Feb 15	
	February 16	<i>Chapter 7: Cellular respiration</i>	Due 8am Feb 16		
	February 17				
6	February 18				
	February 19			Due 8am Feb 22	
	February 23	<i>Chapter 8: Photosynthesis</i>	Due 8am Feb 23		
	February 24				
7	February 25				
	February 26			Due 8am March 1	
	March 2	Exam 2 (Ch. 5-8)			
	March 3	<i>Chapter 9: Cell communication</i>	Due 8am March 3		
8	March 4				
	March 5			Due 8am March 15	
	March 9-13	<i>Spring Break</i>			



Week	Date		Pre-Lecture Homework	Post-Lecture Homework	Reminders
9	March 16	<i>Chapter 10: Cell form and function</i>	Due 8am March 16		
	March 17				
	March 18		Due 8am March 18		
	March 19	<i>Chapter 11: Cell Division</i>			
10	March 23				
	March 24				
	March 25	<i>Chapter 12: DNA replication and manipulation</i>	Due 8am March 25		March 27 withdrawal deadline
	March 26			Due 8am March 29	
11	March 30	Exam 3 (Ch. 9-12)			
	March 31	<i>Chapter 14: Mutation and DNA repair</i>	Due 8am March 31		
	April 1				
	April 2			Due 8am April 5	
12	April 6	<i>Chapter 15: Genetic variation</i>	Due 8am April 6		
	April 7				
	April 8				
	April 9			Due 8am April 12	
13	April 13	<i>Chapter 16: Mendelian inheritance</i>	Due 8am April 13		
	April 14				
	April 15			Due 8am April 15	
	April 16	<i>Chapter 17: Beyond Mendel</i>	Due 8am April 16		
14	April 20				
	April 21				
	April 22			Due 8am April 22	
	April 23	Exam 4 (Ch. 14-17)			
15	April 27	<i>Chapter 19: Genetic and epigenetic regulation</i>	Due 8am April 27		
	April 28				
	April 29				
	April 30			Due 8am April 30	

Final Exam: Monday May 4, 8-10am



Policy Statement on Academic Dishonesty

Academic dishonesty will not be tolerated. Among the aims of education are the acquisition of knowledge and development of the skills necessary for success in any profession. Activities inconsistent with these aims will not be permitted. Students are responsible for knowing what constitutes academic dishonesty. If students are uncertain about what constitutes plagiarism or cheating they should seek the instructor's advice. Examples of academic dishonesty include, but are not limited to:

- Plagiarizing or representing the words, ideas or information of another person as one's own and not offering proper documentation;
- Giving or receiving, prior to an examination, any unauthorized information concerning the content of that examination;
- Referring to or displaying any unauthorized materials inside or outside of the examination room during the course of an examination;
- Communicating during an examination in any manner with any unauthorized person concerning the examination or any part of it;
- Giving or receiving substantive aid during the course of an examination;
- Commencing an examination before the stipulated time or continuing to work on an examination after the announced conclusion of the examination period;
- Taking, converting, concealing, defacing, damaging or destroying any property related to the preparation or completion of assignments, research or examination;
- Submitting the same written work to fulfill the requirements for more than one course.

While academic integrity is particularly the responsibility of the student, the faculty members also have a responsibility. Assignments and tests should be constructed and proctored so as to discourage academic dishonesty. Faculty members are expected to inform their students explicitly as to what materials and procedures are authorized for use in the preparation of assignments or in examinations (e.g., the use of calculator, computer, text materials, etc.). Should cases of academic dishonesty be found among students, the instructor may choose to counsel the student, or the following sanctions may be imposed:

- The student may be assigned an F for the work in question.
- The student may be assigned an F for the course. In this case the instructor should inform the Dean and the student of this action. The Dean will make certain that the student receives the F grade and is not permitted to withdraw from the course.
- The student may be placed on probation or suspended for some definite period of time, dismissed or expelled by the Dean if either the seriousness of the offense or a record of repeated offenses warrants it. A notation that such a sanction has been imposed will be made part of the student's permanent record. It is expected that the Dean will consult with the instructor and the student in making such a judgment, and that the Dean will notify the student of the sanction imposed and of the appeals procedure.

A student found to be academically dishonest by a faculty member may appeal according to procedures approved by the respective colleges. The procedures for making a final appeal to the Student Grievance Committee may be found in the Student Handbook.