

BIOL 2170: Fundamentals of Life Science: Biomolecules, Cells, and Inheritance

Semester: FALL 2015

Section: 001 (TR 1:00-2:40 pm)

Location: **Wolfe Hall 1205**

Instructor: Dr. Deborah Chadee

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Office hours: Tuesday 11:00 am -1:00 pm

Thursday 11:00 am -1:00 pm (or by appointment)

Required Text

How Life Works – by Morris, Hartl, Knoll, and Lue, 1st edition

Important Dates

Last day to withdraw: Oct. 30, 2015

Final Exam: Wednesday, Dec. 16th, 2:45-4:45 pm

Test schedule

		<u>Points</u>
Test 1	Sept. 10	100
Test 2	Oct. 1	100
Test 3	Oct. 29	100
Test 4	Nov. 19	100

Top three tests 300

Homework 50

Clicker questions 25

Final Exam 125

Total 500

Exams & Grading:

Your final grade will be calculated from three (of four) best tests, homework, and the final comprehensive exam.

There will be four 50 minute in-class tests and one comprehensive two-hour final examination. Exams will cover what was taught in lectures and the appropriate textbook material.

The in-class tests will usually consist of 50 multiple choice questions, with the possibility of some short answer or problem-solving questions.

The final exam is comprehensive and will cover the entire semester. The final exam will have 100 multiple choice questions, with the possibility of some other types of questions.

Tests will be scored as % correct points, which will correspond to a letter grade according to the table below. This scale is based on the assumption that knowledge of more than 50% of the material is needed to pass this course.

<u>Grade</u>	<u>% Correct</u>	<u>Grade</u>	<u>% Correct</u>
A	90-100	C+	71-74
A-	87-89	C	65-70
B+	83-86	D+	59-64
B	79-82	D	55-58
B-	75-78	D-	51-54
F	0 - 50		

Any student listed in the course after Oct. 30 can only receive a grade of A-F.

Any student who stops attending class after taking the first test will receive a grade F for all the missed tests, unless such student withdraws from the course.

I will only assign IN grades in extraordinary cases when unexpected conditions prevent a student from completing the course within the term of enrollment. An IN grade must be removed at the earliest possible time.

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

1. Be sure to bring two number 2 (#2) pencils, an eraser, and your valid UT student ID card to an examination.
2. Examinations start and end at specified times. Under no circumstances will students be admitted to an exam, which has been in progress for longer than 10 minutes. *Additional time will not be given to students who come late or the exams.*

3. All the examinations must be taken at the scheduled time with the section for which you are officially registered.
4. Please be considerate of your fellow students. During the time of an examination, quiet is to be maintained at all times. If you have to talk to someone about something, please do it outside the room after the exam is taken. Individuals violating this rule will have their exams taken and will receive an F grade for that exam.
5. If the University is closed on a day scheduled for a test, your test will be given during the next time class is held.
6. **I DO NOT GIVE MAKE-UP TESTS.** If you miss a test, that test will be counted as your lowest scoring test and dropped from your final score. If you know in advance that you must legitimately miss a test, see me to schedule an early test.
7. Errors in test grading should be brought to my attention within one week of the time you receive your corrected examination.
8. **Please use good judgment with cell phones and pagers – turn off ringers and don't take calls while in class.**
9. If you have a certifiable problem in taking timed tests or if your native language is not English and you still rely on a translation dictionary, please notify me with your name, student number, and a certifiable explanation of your problem before the end of the first week's lecture. You may take the tests with an extended time limit and/or dictionary access at the Student Testing Center.

Homework: The homework component of the course will consist of online quizzes that will have questions related to the material covered in the lectures. The quizzes must be completed by the assigned due dates.

Clicker questions: There will be in-class questions that you will need to answer using the Turning Technologies Response Card RF (clicker) based on what is being discussed in class. A varying number of clicker questions will be asked each day, but in total they are worth 5% of your final grade. You will get full credit for correct answers and half credit for incorrect answers, and no credit for not answering a question. There will be no make-up questions, but the lowest 10% will be dropped. In order to get credit for using your clicker you will need to register on the Blackboard site. Carrying a clicker for a student who is absent with the intent to give the absent student points, is academic dishonesty. Both the student present with 2 clickers and the absent student will receive a 0 for all clicker points for the term for academic dishonesty.

Office hours:

I will be available during office hours to answer questions.

Pointers to success:

1. Attend all of the classes, take notes, and keep up with the readings.
2. Read the text actively – take your own notes as you read to summarize concepts.
3. Study the material regularly and do not wait until the night before class.
4. Look over your notes and understand the concepts. If you have a good memory that helps, but it is much easier to understand a concept than to memorize the entire textbook. If you do not understand something, ask questions during class or come to my office during office hours.
5. Test yourself. Try the discussion questions at the end of every chapter and/or in the study guide.

Topics covered:

The topics will be covered in the sequence listed below. The relevant chapters in the textbook are also listed.

<u>Topic</u>	<u>Chapter</u>
Life	1
The Molecules of Life	2
Nucleic Acids and the Encoding of Biological Information	3
Translation and Protein Structure	4
Organizing Principles: Lipids, Membranes and Cell Compartments	5
Making Life Work: Capturing and Using Energy	6
Cellular Respiration: Harvesting Energy from Fuel Molecules	7
Photosynthesis: Using Sunlight to Build Carbohydrates	8
Cell Communication	9
Cell Form and Function: Cytoskeleton, Cellular Junctions and Extracellular Matrix	10
Cell Division: Variations, Regulation and Cancer	11
DNA Replication and Manipulation	12
Mutation and DNA Repair	14
Genetic Variation	15
Mendelian Inheritance	16
Beyond Mendel: Sex Chromosomes, Linkage and Organelles	17
Genetic and Epigenetic Regulation	19

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.



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BIOL 2170: Biomolecules, Cells, and Inheritance

DATE	TOPIC	CHAPTER
Aug. 25	Life	1
Aug. 27	The Molecules of Life	2
Sept. 1	Nucleic Acids and the Encoding of Biological Information	3
Sept. 3	Translation and Protein Structure	4
Sept. 8	Organizing Principles: Lipids, Membranes and Cell Compartments	5
Sept. 10	EXAM 1	
Sept. 15	Making Life Work: Capturing and Using Energy	6
Sept. 17	Cellular Respiration: Harvesting Energy from Fuel Molecules	7
Sept. 22	Photosynthesis: Using Sunlight to Build Carbohydrates	8
Sept. 24	Cell Communication	9
Sept. 29	Cell Communication	9
Oct. 1	EXAM 2	
Oct. 6	No classes- FALL BREAK	
Oct. 8	Cell Form and Function: Cytoskeleton, Cellular Junctions and the Extracellular Matrix	10
Oct. 13	Cell Form and Function: Cytoskeleton, Cellular Junctions and the Extracellular Matrix	10
Oct. 15	Cell Division: Variations, Regulation and Cancer	11
Oct. 20	Cell Division: Variations, Regulation and Cancer	11
Oct. 22	DNA Replication and Manipulation	12
Oct. 27	DNA Replication and Manipulation	12
Oct. 29	EXAM 3	
Nov. 3	Mutation and DNA Repair	14
Nov. 5	Mutation and DNA Repair	14
Nov. 10	Genetic Variation	15
Nov. 12	Mendelian Inheritance	16
Nov. 17	Mendelian Inheritance	16
Nov. 19	EXAM 4	
Nov. 24	Beyond Mendel: Sex Chromosomes, Linkage and Organelles	
Nov. 26	No classes - Thanksgiving	
Dec. 1	Genetic and Epigenetic Regulation	17
Dec. 3	Genetic and Epigenetic Regulation	19
Dec. 8	Review	19
Dec. 10	TBA	
Dec. 16	FINAL EXAM	

Student Learning Outcomes

Students who successfully complete the course will be able to:

- Illustrate the scientific method through analysis of major biological discoveries.
- Demonstrate an understanding of basic atomic structure and how atoms combine to form molecules.
- Outline the structure and function of the types of macromolecules found in all living organisms.
- Describe current models of cell membrane structure and function.
- Describe the structure and function of cells and the metabolic reactions that occur in cells.
- Understand the overall organization of the chemical pathways involved in cellular respiration and fermentation.
- Describe the overall organization of the chemical pathways involved in photosynthesis and how these pathways accomplish the conversion of light energy into chemical bond energy.
- Describe the major steps in a typical eukaryote cell cycle.
- Explain the process of cell division in both somatic and germ cells.
- Understand DNA and its role in heredity, and how RNA, DNA and proteins are synthesized.
- Describe different types of mutations and their effects on gene products and on phenotype.
- Explain the uses of recombinant DNA technologies.

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.

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*.

Prerequisites and Corequisites: CHEM 1090 or a CHEM placement score of 20, or BIOL 2010 or BIOL 2150 or ACT composite 21.