

# Fundamentals of Life Science II

BIOL 2170-002 - Spring 2014

MW from 4:00-5:40 p.m. in DC1019

## Instructor

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Office Hours: Monday 10 - 11:00 a.m. & Thursday 1 - 2:30 p.m. or by appointment

## Course Description

As a requirement for biology majors this course is the second half of a general introduction to the fundamentals of life science. The topics of discussion focus on molecular biology and provide the fundamental basis of knowledge required for all professions in the life sciences. The specific topics include the molecules of life, cell structure and function, the stages of cell division and how they are controlled, energy processing pathways in plants and animals, genetics, gene expression and cell signaling mechanisms.

## Main Learning Outcomes

Students who successfully complete the course will be able to:

- Illustrate the scientific method through analysis of major biological discoveries.
- Outline the structure and function of the types of macromolecules found in all living organisms.
- Describe the structure and function of cells and the metabolic reactions that occur in cells.
- Explain the process of inheritance.
- Understand different types of mutations and their effects on gene products and on phenotype.
- Describe how RNA, DNA and proteins are synthesized.
- Understand the uses of recombinant DNA technologies.
- Explain the process of cell division in both somatic and germ cells.

## Required Materials

If you have taken BIOL 2150 previously you should already have the required materials and access to the Launchpad website, however, you must register with Launchpad using a course-specific URL that will be sent to you by email and you must register your clicker on the Blackboard course web site if you have not already done so (instructions below). The following materials are required for BIOL 2170:

- **Biology, How Life Works** (1<sup>st</sup> Edition), Morris, Hartl, Knoll, Lue et al. editors (ISBN 978-1-4641-3826-3). Purchase a hardcover, loose-leaf or e-book version. The textbook can also be purchased in two separate volumes in paperback form. BIOL 2170 requires volume one while BIOL 2150 requires volume two.
- **LaunchPad Access:** Access to the LaunchPad website is provided with the purchase of any hard copy of the full textbook or with either of the two volumes. LaunchPad includes the full e-book version of the textbook, the assigned quizzes, adaptive learning questions (Learning Curve) and other online activities. LaunchPad access instructions will be sent to you by email.
- **Clicker:** Turning Technologies response cards are available in the UT bookstore and elsewhere. The most basic model is sufficient. Register your clicker ID on Blackboard (see below).

## Clicker Registration

You must register your clicker on Blackboard by 9 a.m., Monday, **January 13**. Use the Blackboard “Clicker Registration” link and be careful not to enter the letter “o” in place of zero (0) when entering your device ID. The letter “o” is not used in any device ID. *If you miss the deadline or change clickers during the semester you must send me your new clicker ID by email.* The Blackboard registration mechanism will not be used after the January 13 deadline. You will not receive clicker question points unless your current clicker ID is registered in advance of the lecture.

## General Information

- CHEM 1090 or a CHEM placement score of 20 or BIOL 2150 is a prerequisite for this course.
- Lecture slides will be available for download from Blackboard before class (usually the evening before the lecture). Note that you can arrange your Blackboard settings so that you are informed by email when the lecture slides are posted to Blackboard. For instructions see the file “Changing Notifications in Blackboard” under the “More Course Info” link on Blackboard.
- Exam, clicker and homework grades will also be posted on Blackboard. Contact me immediately if there are any issues regarding your clicker or homework grades. Once the exam answers are available you will have *one week to respond* with any exam grading concerns.
- Please ask questions during the lecture, especially if you feel something was not explained clearly. You also have the option of asking questions by email or during office hours.
- Put away your cell phone while in class. Make sure it is off or in silent mode.
- If you are going to bring a laptop or tablet to class please use it for note taking only.
- Please do not bring food into the room, although a drink is acceptable.
- If you wish to make audio recordings of the lectures please ask me first.

## Student Evaluation

Your final grade will be calculated as follows:

54%	Best three of the four in-class exams (18% of your final grade for each)
31%	Comprehensive final exam
10%	Homework (Quizzes, Learning Curve adaptive learning questions and other online activities)
<u>5%</u>	Clicker points
100%	

Grading Scale:	90-100%	A	67-70%	C
	87-89%	A-	63-66%	C-
	83-86%	B+	59-62%	D+
	79-82%	B	55-58%	D
	75-78%	B-	50-54%	D-
	71-74%	C+	<50%	F

## Homework

- Homework will consist of pre-lecture quizzes and adaptive learning questions (LearningCurve) accessed on the LaunchPad textbook website.
- The homework is assigned to encourage reading from the textbook before lectures, so *the best practice is to read the appropriate sections of the textbook before taking the assignment.*
- The first homework assignment will be due on **January 13** before the third lecture. The homework will continue through the remainder of the semester and will be due by **3:00 p.m.** before the start of each lecture.
- Most pre-class activities will consist of either a quiz, with ten multiple-choice or fill in the blank type questions, or a LearningCurve activity. Each pre-lecture quiz or activity will be weighted equally.
- LearningCurve is a personalized and adaptive learning program that uses game-like quizzing to motivate and engage students. Grading details and instructions will be available on Blackboard.
- Homework quizzes can be taken twice so you can try to improve your score if necessary.
- The grading system for homework questions will be set so that you can still receive full credit even if you miss one assignment during the semester. If, for example, 25 homework activities (10 points each) are assigned over the course of the semester then you will only need to collect 240 points to receive the full 10% credit for homework points.
- If you have any problems with the LaunchPad web site, including registration or access to the homework, call the **tech support line at 1-800-936-6899**. An extension to the homework deadline will not be given unless there is record with LaunchPad tech support that indicates you attempted to resolve your issue before the homework due date.

## Clicker Questions

- In each lecture you will be asked approximately four “clicker questions” about the lecture material. Your responses will be recorded using the Turning Technologies response card (clicker).
- **A full point is given for a correct answer, half a point for an incorrect answer.**
- Your clicker must be set to channel 41 to communicate with the receiver.
- We will start using the clickers in the third lecture (**January 13**).
- The grading system for clicker questions will be set so that you can still receive full credit even if you miss two classes during the semester. If, for example, 100 clicker points are available over the course of the semester (25 lectures x 4 questions) then you will only need to collect 92 points to receive the full 5% credit for clicker points.
- A small prize will be given to the student that maintains a perfect clicker score for the longest period through the semester.

## Exam Information

- There will be four one-hour exams during the semester and each will consist of 50 multiple-choice questions. These exams will cover only new material (since the last exam). Exam questions will be based on the material covered in the lectures.
- The final exam (one hour and forty minutes in length) will be comprehensive and consist of 100 multiple-choice questions. Approximately half of the exam will cover the last section of the course while the remaining half of the exam will cover the earlier sections of the course.
- Bring at least two pencils and an eraser to the exams.
- Students will be asked to present a **picture ID** when turning in their exam.
- Additional time will not be given to students who come late for exams and latecomers will not be permitted to start if someone has already left the exam.
- If for any reason the university is closed on the day of a scheduled exam, the exam will be given during the next scheduled class.

## Absences

- Make-up exams and adjustments to clicker grades or homework deadlines will only be provided for *serious* medical or personal reasons that are backed up with the proper documentation such as a doctor’s note. *Accommodations will be made only if the instructor is notified as soon as possible after the absence.*
- Make up exams will be scheduled within a week of the original exam date. If multiple students need a make-up exam they will write it at the same time in the Testing Center (FH1080). If it is not possible for a student to take the make-up exam within one week then the three remaining in-class exams will be used to determine the final grade for that student. Make-up exams will be long answer or essay format with few, if any, multiple-choice questions.

## Academic Dishonesty

- The university policy on academic dishonesty can be accessed at:  
“<http://www.utoledo.edu/dl/students/dishonesty.html>”
- Bringing a clicker to class for someone else is considered academic dishonesty for both students involved. Both students will be sanctioned according to university policy.
- Do not talk to other students or use electronic devices during examinations. Keep your eyes on your own work. Those that violate these rules will receive an F for the exam.

## Keys to Success

1. **Attend every class.** Material presented during class will be emphasized for the exams and clicker points contribute to your final grade. In-class interactions with the instructor help strengthen your understanding of the material.
2. **Do not wait until a day or two before the exam to study.** This is one of the worst and most common mistakes students make. Go over your notes as often as you can between exams and make sure you understand the material *before* your last study session. Ask questions about topics you don't understand as soon as possible, either during lecture or during office hours.
3. **Be active with your studying.** Reading the textbook before class, taking notes during class, and making a separate set of study notes after class will aid in your ability to understand and retain the presented concepts. Passively reading the textbook and listening to the lectures without being engaged in the material will not lead to success.
4. **Test yourself.** Have a roommate or classmate ask you questions about the material in your notes. Do all of the available LaunchPad activities (Quizzes, Flash Cards, Tutorials, etc.) and the self-assessment questions in the textbook. Online activities associated with the textbook are available on LaunchPad. Testing yourself will let you know where you might have to spend more time on the details.
5. **Form a study group.** It helps with number four above and you will find out how well you know the material when you try to explain it to someone else.
6. Additional information can be found in the files “Keys to Success” and “Survival Skills” under the “More Course Info” link on Blackboard.

## Course Schedule

Date	Lecture	Topic	Chapter
Jan 6	1	Chemistry of Life	2
Jan 8	2	Macromolecules I: Proteins, Carbohydrates and Lipids	2
Jan 13*	3	<b>First Homework Quiz Due</b> Macromolecules II: DNA is the Genetic Material	2/3
Jan 15	4	Transcription and RNA Processing	3
Jan 20		<i>Martin Luther King Holiday</i> <b>(Last Day to Drop)</b>	
Jan 22	5	Translation and Protein Structure	4
<b>Jan 27</b>		<b>Exam I</b>	
Jan 29	6	Membranes, Diffusion and Osmosis	5
Feb 3	7	The Internal Organization of Cells	5
Feb 5	8	Energy and Enzymes	6
Feb 10	9	Cellular Respiration	7
Feb 12	10	Photosynthesis	8
<b>Feb 17</b>		<b>Exam II</b>	
Feb 19	11	Cell Communication	9
Feb 24	12	Cytoskeleton	10
Feb 26	13	Cell Junctions and the Extracellular Matrix	10
Mar 3		<i>Spring Break</i>	
Mar 5		<i>Spring Break</i>	
Mar 10	14	Cell Division and Cancer I	11
Mar 12	15	Cell Division and Cancer II	11
<b>Mar 17</b>		<b>Exam III</b>	
Mar 19	16	DNA Replication <b>(Last Day to Withdraw Mar 21)</b>	12
Mar 24	17	DNA Manipulation	12
Mar 26	18	Genomes	13
Mar 31	19	DNA Mutation and Repair	14
Apr 2	20	Genetic Variation	15
<b>Apr 7</b>		<b>Exam IV</b>	
Apr 9	21	Mendelian Inheritance I	16
Apr 14	22	Mendelian Inheritance II	16
Apr 16	23	Sex Chromosomes, Linkage and Complex Traits	17/18
Apr 21	24	Genetic and Epigenetic Regulation I	19
Apr 23	25	Genetic and Epigenetic Regulation II	19
<b>May 1</b>		<b>Final Exam (2:45 - 4:45 p.m.)</b>	

The pace of the lectures varies from year to year so the exact day a particular topic is discussed may differ from this schedule. However, the topic order and the exam dates will not change.

\***Register your clicker by 9 a.m. on January 13.** If you miss the deadline please email me your clicker ID instead of using the Blackboard registration. This also applies if you change your clicker ID during the semester.