Advanced Molecular Biology

The University of Toledo
Department of Biological Sciences, College of Natural Sciences and Mathematics

BIOL8010-001, CRN: 41205
4 credit hours

Instructor:	Dr. Lirim Shemshedini	**Term:**	Fall 2015
Office Hours:	T, F 12-2	**Class Location:**	WO 3246
Office Location:	WO 3227	**Class Times:**	M, W 5-7
Office Phone:	419-530-1553	**Course Website:**	https://blackboard.utdl.edu
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COURSE/CATALOG DESCRIPTION

Analysis of recent developments in prokaryotic and eukaryotic molecular biology through evaluation and discussion of current literature.

COURSE OVERVIEW

As a requirement for Biology graduate students (both Masters and Doctoral), this 4-credit hour lecture course is offered in the Fall semester, followed by the Spring semester course, Advanced Cell Biology. The topics of discussion focus on molecular biology and provide the fundamental basis for our graduate students to succeed in our graduate program. The specific topics include DNA and protein structure, molecular biology methods, chromatin and transcription factors, RNA processing and regulation, translation and post-translational processes, DNA replication and genetics, transposable elements, homeotic genes, and gene therapy.

STUDENT LEARNING OUTCOMES

Upon completion of this course, students will be able to:

- Describe the structure and function of the major types of macromolecules found in all living organisms.
- Outline the major steps of gene expression.
- Understand the interplay of proteins and DNA that is responsible for regulated expression of genes that occurs in eukaryotic cells.
- Describe the important role of chromatin in eukaryotic gene expression.
- Explain the process of DNA replication that ensures high-fidelity DNA synthesis.
- Understand the roles of RNA as a regulator of gene expression.
- Understand the mechanism of transposable element movement in cells.
- Understand recombinant DNA technologies and how they are used.
- Utilize critical thinking in the application of cell biology knowledge in research.

TEACHING STRATEGIES-not essential

This course is designed to stimulate student learning through lectures and reviews of relevant research papers. Powerpoint slides will be made available to students through Blackboard, with lectures using both the powerpoint slides and whiteboard. No lecture notes will be provided to students. Please be prepared when you come to class by completing any assigned readings and reading the appropriate chapters of the textbook.

PREREQUISITES

Prerequisite: Admission into the graduate program of the Department of Biological Sciences.

REQUIRED TEXTS AND ANCILLARY MATERIALS

All the required material is provided by the instructor and will be uploaded in Blackboard before the class starts.

TECHNOLOGY REQUIREMENTS-not essential

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.

ACADEMIC POLICIES-NOT ESSENTIAL

Academic Policies for Graduate Students

As a student in my course and enrolled at the University of Toledo you should be familiar with the policies that govern the institution's academic processes, for example, Academic Dishonesty, Enrollment Status, and Grades and Grading. Please read Graduate Academic Policies.

Missed Class Policy

Students are expected to attend every class meeting of courses in which they are registered. Please read the Missed Class Policy.

STATEMENT OF ACADEMIC DISHONESTY of Department of Biological Sciences is listed at the end of the syllabus.

COURSE EXPECTATIONS (IF APPLICABLE)-NOT ESSENTIAL

The students will be expected take notes, use the powerpoint slides, and read all assigned papers to prepare themselves for quizzes and exams. Since this course is based almost entirely on

demonstrating comprehension of the lecture materials, students are required to attend every class. Unexcused absences will not be tolerated, and excused absences should be rare. While attending class is important, participating in class discussions is also critical for a good grade in this class. Students must demonstrate that they have read the assignments and that they have done the extra background analyses needed to comprehend the material. The only way to do this is to get involved in the discussions, ask questions and be prepared to answer.

GRADING POLICIES

Your final grade will be calculated based on the points breakdown below, which include points for exams, quizzes, and class participation:

	Points
Exam 1	100
Exam 2	100
Quizzes	80
Class participation	20
Final Exam	200

Grading Scale:				
	90-100%	A	67-70%	C
	86-89%	A-	63-66%	C-
	83-85%	B+	59-62%	D+
	78-82%	B	55-58%	D
	74-77%	B-	50-54%	D-
	71-73%	C+	<50%	F

There may be adjustments made to this scale at the instructor's discretion.

COMMUNICATION GUIDELINES

The instructor is available by appointment, or can answer Email questions.

TECHNICAL SUPPORT-not essential

If you encounter technical difficulties with Blackboard, please contact the UT Online Help Desk at (419) 530-8835 or utdl@utoledo.edu. The Help Desk offers extended hours in the evenings and on weekends to assist students with technical problems. When calling after hours, leave a detailed message, including your Rocket Number and phone number, and an Online Learning staff member will respond on the next business day. The UT Online Help Desk website is available at: http://www.utoledo.edu/dl/helpdesk/index.html

Technical questions related to on-campus Internet access, virtual labs, hardware, software, personal website hosting, and UTAD account management can be directed to UT's IT Help Desk at (419) 530-2400 or ithelpdesk@utoledo.edu. The IT Help Desk website is available at http://www.utoledo.edu/it/CS/HelpDesk.html.

LEARNER SUPPORT not essential

The University of Toledo offers a wide range of academic and student support services that can help you succeed:

University Libraries
University Libraries are your gateway to information at the University of Toledo connecting you with the resources you need for education, and research.

eTutoring Services
The Ohio eTutoring Collaborative, in partnership with The University of Toledo, now provides online tutoring support for all UT students. eTutoring Services are offered in a wide array of subjects, including Writing, Math, Calculus, Statistics, Accounting, Biology, Chemistry, and Anatomy and Physiology.
Learn more at: https://www.etutoring.org/login.cfm?institutionid=232&returnPage

Office of Academic Access
The Office of Academic Access provides accommodations and support services to students with disabilities.
Learn more at: http://www.utoledo.edu/utlc/academicaccess/index.html

Counseling Center
The Counseling Center is the university's primary facility for personal counseling, psychotherapy, and psychological outreach and consultation services. The Counseling Center staff provide counseling (individual and group), mental health and wellness programming, and crisis intervention services to help students cope with the demands of college and to facilitate the development of life adjustment strategies.
Learn more at: http://www.utoledo.edu/studentaffairs/counseling/

TENTATIVE CLASS SCHEDULE-Example of Spring 2008 Semester, last time offered- not essential
Depending on the time available, each session will cover two papers that bear on the topics shown below. A list of papers is available at the end of the syllabus for the students to choose from. Most of times a group of papers on the same subject are provided. The students are required to present only one but encouraged to compare between different papers. The instructor will begin each class with a brief introduction.

August	24	Introduction/DNA and Protein Structure I
	26	Introduction/DNA and Protein Structure II
	31	Methods
September	2	*Quiz-Paper 1*/Chromatin I
	7	**Labor Day**
	9	Chromatin II
	14	*Quiz-Paper 2*/Transcription I
	16	Transcription II
	21	Transcription III
	23	*Quiz-Paper 3*/Nuclear Receptors I
	28	Nuclear Receptors II/*Quiz Paper 4*
	30	**Exam I** (covering previous materials)
October	**5**	**Fall break**
	7	RNA Processing I

	12	RNA Processing II
	14	RNA Regulation
	19	*Quiz-Paper 5*/Translation I
	21	Translation II
	26	*Quiz-Paper 6*/Postranslational Modifications and Protein Function I
	28	Postranslational Modifications and Protein Function II/*Quiz-Paper 7*
November	2	**Exam II** (covering previous materials)
	4	DNA Replication I
	9	DNA Replication II/*Quiz-Paper 8*
	11	**Veterans Day**
	16	*****Genetics I
	18	*****Genetics II/*Quiz-Paper 9*
	23	Transposable Elements I
	25	**Thanksgiving Break**
	30	Transposable Elements II/*Quiz-Paper 10*
December	2	Homeotic Genes I
	7	Homeotic Genes II/*Quiz-Paper 11*
	9	Gene Therapy

Final Exam Date: Dec. 16 5-8 pm

Note: Both the class schedule and covered topics may be adjusted at the instructor's discretion.

STATEMENT OF ACADEMIC DISHONESTY

Department of Biological Sciences

Academic dishonesty by students enrolled in undergraduate and graduate courses and programs offered by the Department of Biological Sciences will not be tolerated. Academic dishonesty includes but is not limited to:

1. Obtaining assistance from another individual during an examination.

2. Giving assistance to another individual during an examination.

3. The unauthorized use of study material or textbooks during an examination.

4. Changing answers on an examination after it has been returned and then submitting it for regrading.

5. Plagiarizing written assignments. Plagiarizing includes but is not limited to: a) Copying laboratory reports from previous years, b) copying or paraphrasing reports, term papers, or these prepared by other students, c) unauthorized collaboration in the preparation of reports, term papers, or theses, and d) use of another author's materials without appropriate acknowledgement through quotation and citation.

6. Attempting to bribe or otherwise induce an instructor to alter either a grade or examination score.

7. Obtaining or attempting to obtain a copy of an examination prior to its administration.

In accordance with policies presented in The Student Handbook and The University Catalog, Instructors have the responsibility and right to report cases of alleged dishonesty to departmental, college, and university administrative units. Students involved in academic dishonesty may expect to receive a grade of F on specific assignments as well as in the course where the assignment was made. In addition, disciplinary action may be recommended through appropriate college and university disciplinary committees. Please consult your instructor for instructions on the implementation of this policy.