

**BIO 4110 – Biomedical Technology and Molecular Biology
Fall 2017**

Instructor: Dr. Lori Pile

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- Class meets: Lecture-
1:00 to 2:15 Tuesday and Thursday – 426 State Hall

Discussion/Writing Workshop–
11:30 to 12:20 Thursday – 409 State Hall – Jacey Sanders
2:30 to 3:20 Thursday – 407 State Hall – Ashlesha (Ash) Chaubal
- Office hours: Tuesdays 11:00-12:00 or by appointment
- Class Web site: <http://blackboard.wayne.edu>
Lecture notes and additional assigned readings are regularly posted. Please check this site often.
- 4 credits (lecture and in class group discussion and problem solving)

Prerequisites: The prerequisite courses for BIO 4110 are BIO 3070 and BIO 3100. In addition, because this is the advanced writing intensive for majors, it is strongly recommend that you successfully complete your intermediate writing requirement before taking this course.

Learning Outcomes: Student knowledge will be assessed through quizzes, assignments and exams. Upon successful completion of this course students will

- demonstrate a thorough understanding of the general principles of molecular biology including general flow of genetic information, structure function relationships and systems using genome wide approaches and analyses.
- apply quantitative reasoning skills through experimental design and data analysis.
- have an understanding of the evolutionary framework for heredity through investigation of genetic diversity and genome evolution.
- be an informed member of society through understanding ethical implications of genetic data.

As this course fulfills the General Education Writing Intensive Course requirement, in their own written texts, students will demonstrate their mastery of written communication in the discipline of molecular biology. Specifically, they will:

- demonstrate the ability to use general conceptual statements supported by evidence appropriate to the discipline.

- demonstrate comprehension of discipline-appropriate material (including scholarly articles and lab experiments) by using discipline-suitable examples, level of detail, and organization.
- exhibit critical thinking by integrating and synthesizing multiple distinct outside sources.
- produce a conclusion that effectively interprets previously presented evidence and key points, adds new insights, and results in an integrated whole.
- produce focused writing that exhibits consistency, flow, correct style formatting with correct grammar.

Text: Fundamental Molecular Biology, Second Ed., Lizabeth A. Allison

Useful Animations: The following websites contain very useful animations on some of the topics that are covered in the course.

<http://www.dnalc.org/resources/animations/>

<http://www.dnai.org/index.htm>

Additional Reading Assignments: PDFs of review and primary literature articles will be posted on Blackboard. Please check the website often.

Grading Policy: Grades will be from 0 to 100. Final grades will be calculated using a distribution curve if necessary. After each exam, the class grade distribution will be given.

Grade Scale:	91.6-100	A
	90.0-91.5	A-
	88.5-89.9	B+
	81.6-88.4	B
	80.0-81.5	B-
	78.5-79.9	C+
	71.6-78.4	C
	70.0-71.5	C-
	68.5-69.9	D+
	61.6-68.4	D
	60.0-61.5	D-
	0-59.9	F

Please note: if you are using this course to fulfill the WI requirement for Biology majors, you must receive the grade of C or above.

Grading: Grades will be based on points earned from participation in the discussion section, quizzes, problem sets, writing assignments and exams.

Writing assignments and problem sets will be due throughout the semester. Different types of writing assignments will be given, including written summaries of primary literature and a term paper. All assignments are due just prior to the beginning of class on the specified date. **No make up assignments will be given for items not turned in on time.**

There are three in class lecture exams and a comprehensive final exam. Exam grades will be posted on Blackboard as soon as possible after the exam. The three lecture exams will consist of multiple choice, short answer, essay and problem solving questions. Each of the three lecture exams is worth 90 points. The lecture exam with the lowest score will be dropped. If you miss an exam, it will automatically be considered as the lowest score and will be dropped. The final exam is required and cannot be dropped. The final exam is comprehensive, will be similar in style to the lecture exams and is worth 115 points. **No make up exams will be given and no exams will be given in advance.**

Discussion Participation	20 points
Quiz/Problem Sets	55 points
Writing Assignments*	50 points
Term Paper Assns*	90 points
Two lecture exams	180 points
FINAL EXAM	115 points
TOTAL	510 points

Note: there is no extra credit or extra assignments. Grades will be based solely on the items listed above.

*Additional Note: Because the class fulfills the writing intensive requirement, **you must pass the writing intensive part of this course in order to pass this class.** Therefore, if you receive fewer than 84 points for the writing intensive material that includes the writing and term paper assignments, you will receive the grade of "F" for this course.

Exam Dates:	Lecture Exam I	Tuesday, September 26
	Lecture Exam II	Tuesday, October 24
	Lecture Exam III	Tuesday, November 21
	FINAL EXAM	Thursday, December 14 (12:30-2:30)

Writing Intensive: The writing intensive course focuses on learning to read and synthesize primary and review literature in molecular biology and biotechnology. This course does not focus on basic or intermediate writing skills, but these skills are required to successfully complete this course. If you have trouble with sentence and paragraph structure or other writing skills, you are expected to get help outside of this course. The University provides the writing center as a resource. For more information, please go to <http://www.clas.wayne.edu/writing> or call (313) 577-2544.

Assignment and Examination Policies:

- No makeup assignments or exams will be given and no exams will be given in advance.

- Anyone caught cheating on an assignment or exam will automatically receive a failing grade for the class and procedures for expulsion of the guilty individual from Wayne State University will be undertaken. Plagiarism is a form of cheating and therefore subject to the same penalty. Please refer to <http://www.plagiarism.org> for information on what constitutes plagiarism and how to avoid it.
- Your written work will be submitted to SafeAssignment for an evaluation of your ideas and proper use and attribution of sources. As part of this process, you may be required to submit electronic as well as hard copies of your written work, or be given other instructions to follow. By taking this course, you agree that all assignments may undergo this review process and that the assignment may be included as a source document in SafeAssignment's restricted access database, solely for the purpose of detecting plagiarism in such documents. Any assignment not submitted according to the procedures given by the instructor may be penalized or may not be accepted at all. Because our goal is to help you learn how to not plagiarize, information on how to avoid plagiarism will be provided in class and on Blackboard.
- Students will not be allowed to leave the room during an exam. Once a student has left the room, he or she will not be allowed to return.
- Absolutely no talking among students will be tolerated during the exam. Students observed talking will receive a grade of zero on the exam.
- All electronic devices including, but not limited to, cell phones, pagers, PDAs, iPods, and other audio/video devices and computers are strictly forbidden during the exam and should be stored out of sight. If any of these items are observed during the exam, they will be confiscated. Cell phones should be turned off before you enter the room; cell phones that ring during an exam will be confiscated.
- Conflicts regarding the grading of assignments and exams must be resolved within one week of the return date. The item in question must be returned along with a written statement explaining the concern.

Course Participation: WSU has implemented a new policy requiring student participation in courses. A new participation verification system is in place. You must attend at least one lecture during the first two weeks of class to fulfill the attendance/participation requirement. If you do not attend, the Registrar will administratively withdraw the student from the relevant class(es) and Student Financial Aid will adjust financial aid accordingly. For additional information, please refer to <http://reg.wayne.edu/gotoclass.php>

General Policy: 1) September 13 is the last day to drop the course and retrieve your tuition.

- 2) September 27 is the last day to drop the course without the instructor's signature. Does not appear on record.

- 3) September 28 to November 12, the instructor's signature is required to withdraw from course. One of the following grades will be assigned:

WP-withdrawal with a passing grade earned to date

WF-withdrawal with a failing grade earned to date

WN-withdrawal never attended, or no graded work to date

The grade assigned will be based on the points accumulated to date. Grades will be given using a straight scale, no curve is applied to grades of students withdrawing from the course.

- 4) November 12 is the last day to withdraw from the course. Students are not permitted to withdraw at the end of the semester and no exceptions to this policy will be made.

- 5) If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

- 6) In the event of a University closure on the day of an exam, the exam will be given during the next regularly schedule lecture period. University closures will be publicized through:

- the University Newslines (313) 577-5345*
- WSU Homepage (www.wayne.edu)*
- WSU Pipeline (www.pipeline.wayne.edu)*
- WDET-FM (Public Radio 101.9)
- by other local radio and television stations

* Note: The information on closures and class cancellations is likely to be found at these locations before it is broadcast by local radio and television stations.

- 7) For any and all issues not covered in this syllabus, refer to the "Student Due Process Policy".

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Lecture Schedule (subject to change)

Lecture Number	Date	Lecture Topic	Reading from Fund Molecular Biology 2 nd Edition
1	Aug 31, Th	The Beginnings of Molecular Biology	Ch 1, 1.3-1.4
2	Sep 5, T	The Structure of DNA Protein Structure and Function	Ch 2, 2.1-2.3 Ch 4, 4.1-4.4
3	Sep 7, Th	Recombinant DNA Technology and Molecular Cloning	Ch 8, 8.1-8.6
4	Sep 12, T	Recombinant DNA Technology and Molecular Cloning	Ch 8, 8.1-8.6
5	Sep 14, Th	Tools for Analyzing Gene Expression	Ch 9, 9.4-9.5
6	Sep 19, T	Analysis of Proteins	Ch 9, 9.2, 9.6, 9.8-9.10
7	Sep 21, Th	Catch up and Review	
8	Sep 26, T	Exam I (Lectures 1-7)	
9	Sep 28, Th	Tools for Analyzing Gene Expression	Ch 9, 9.1-9.3
10	Oct 3, T	Transcription in Eukaryotes – I	Ch 11, 11.1-11.5
11	Oct 5, Th	Transcription in Eukaryotes - II	Ch 5, 5.3, Ch 11, 11.6-11.8
12	Oct 10, T	Epigenetic Mechanisms of Gene Regulation	Ch 12, 12.1-12.4
13	Oct 12, Th	RNA Interference	Ch 13, 13.7 & BB
14	Oct 17, T	RNA Processing	Ch 13, 13.1-13.6
15	Oct 19, Th	Catch up and Review	
16	Oct 24, T	Exam II (Lectures 8-15)	
17	Oct 26, Th	DNA Replication and Telomere Maintenance	Ch 6, 6.1, 6.3, 6.7 & BB
18	Oct 31, T	Transposable Elements	Ch 5, 5.4, Ch 12, 12.5 & BB
19	Nov 2, Th	Genetically Modified Organisms	Ch 15, 15.1-15.4
20	Nov 7, T	CRISPR/Cas9	BB
21	Nov 9, Th	Cloning by Nuclear Transfer	Ch 15, 15.5 & BB
22	Nov 14, T	Stem Cell Biology	Ch 15, 15.5 & BB
23	Nov 16, Th	Catch up and Review	
24	Nov 21, T	Exam III (Lectures 17-23)	
25	Nov 28, T	Genome Analysis I	Ch 8, 8.6-8.7, Ch 16, 16.1-16.4
26	Nov 30, Th	Genome Analysis II	Ch 16, 16.5-16.6
27	Dec 5, T	Gene Therapy & Personalized Medicine	Ch 17, 17.3 & BB
28	Dec 7, Th	Catch up and Review	
	Dec 14, Th	Final Exam - Comprehensive	12:30-2:30