

Biology/Biochemistry 6600: Advanced Molecular Biology

Catalog description: Genetic structure and regulation of gene expression in prokaryotic and eukaryotic organisms; mechanisms of gene action, gene/enzyme relationships and metabolic control; biochemical manipulation and characterization of genetic macromolecules. Prerequisite(s): BIOL 4570 or 5340 or equivalent.

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Office hours: by appointment (call or e-mail for an appointment)

Prerequisites: Satisfactory completion of BIOL 4570 or 5340 or their equivalents.

Class time and place: MW 4-5:20, Biology 440

Recommended textbooks:

1. Watson, Baker, Bell, Gann, Levine, Losick. 2004. Molecular Biology of the Gene, 5th ed. Pearson Education Publishers, Glenview, IL
2. Lewin. 2004. Genes VIII. Pearson Education, Inc., Upper Saddle River, NJ

There will be auxiliary readings from the recent literature. These will be posted on the course website at <http://webctvista.unt.edu>.

Syllabus: This syllabus is tentative and subject to change.

Week	Date	Topic	Reading
1	1.15 1.17	Holiday DNA Structure and Replication	Watson, ch. 6, 7; Lewin ch. 20, 23; readings
2	1.22 1.24	DNA Replication	Watson, ch. 6, 7; Lewin ch. 20, 23; readings
3	1.29 1.31	Paper and presentation topics due DNA Recombination and Repair	Watson, ch. 6, 7; Lewin ch. 20, 23; readings
4	2.05 2.07	DNA Structure and Chromatin	
5	2.12 2.14	Chromatin	
6	2.19 2.21	Exam 1 Transcription; Gene expression methodology, microarrays	
7	2.26 2.28	RNA polymerases	
8	3.05 3.07	RNA processing - splicing	
9	3.12 3.14	Regulation of gene expression	

10	3.19 3.21	SPRING BREAK	
11	3.26 3.28	Gene silencing	
12	4.02 4.04	Exam 2 Translational mechanisms and control	
13	4.09 4.11	Genomic biology	
14	4.16 4.18	Positional cloning	
15	4.23 4.25	Phylogenies	
16	4.30 5.02	PRE-FINALS WEEK, PAPERS DUE	
17	5.07	FINAL WEEK: Exam 3	

Exams: Three (3) in-class examinations (including the final exam) will be given, and the final examination will not be comprehensive. The exams will consist of problems about DNA structure and function, genetic engineering methodology, transcription, genomics, bioinformatics, other class topics, and critiques about articles from the current literature. Possible exam questions will be handed out before each exam. In addition, each student will have a 15-20 minute class presentation and write a 5-page paper on individual topics related to the course. Source material for the student presentations will consist of one (1) review article and one (1) recent research journal article related to the topic (pre-approved by RD). Each of the three exams will comprise 25% of your grade and the paper and presentation 25% of your grade.

Guaranteed minimum grades:

A	90 % or higher
B	80 – 89.99 %
C	70 – 79.99 %
D	60 – 69.99 %
F	below 60 %

Because this is a graduate class, the instructor is expecting all students to work at “A” level.

Research Paper and Presentations: Each student in the class will choose an area/topic within advanced molecular biology. Topics are due on Monday, January 29th at the beginning of class. Students will present the instructor with their one (1) research paper and one (1) review paper at that time. A 5 page single-spaced paper on the topic is due at the beginning of class on April 30th. Beginning the week of March 5th, students will be assigned a 15-20 minute slot for their presentation. The week before the presentation, both papers will be distributed to the class – the student is responsible for this. A summary of no more than one page (single spaced) for each article will be prepared for the class on the day of the presentation. The one-page summaries will contain information on the hypothesis investigated, relevant methods, results, and

significance. Students will prepare pertinent overheads or powerpoint for discussion in class and lead a discussion regarding the key points in their papers. The presentation will count for 10 % of the final grade.

Research Paper and Presentation Grading:

Purpose: The point of the paper and presentation is to become focused on an area within molecular biology in some depth and to develop scientific thinking and writing.

1. Each student in the class will choose an area/topic within molecular biology on which to write a proposal. The topic may be similar to one on the syllabus or may be different. You may use references in the back of the text chapters to begin looking for a paper or you may go to PubMed and search there.
2. Topics are due on Wednesday January 29. At that point, students will turn in a one (1) page summary of the topic, together with one (1) review paper and one (1) primary literature paper on the topic of interest. The one page summary should contain a statement of the investigation to be taken in the paper. Complete references of the review and primary papers are expected. The abstracts of the references should be appended to the one page summary.

Research Paper and Presentation Content:

1. Review the subject you chose in a clear and logical manner.
2. Explain the question and/or hypothesis that is discussed in the primary literature paper.
3. Explain how the experiments in the primary paper relate to the question and/or hypothesis being investigated.
4. Explain how the results from the experiments are interpreted. Discuss whether other interpretation is possible.

Format for Paper:

Page 1: Introduction: Review of research area and previous experiments done by others.

Page 2-4: Logic of experiments performed and results obtained.

Page 5: Discussion of results.

Page 6: References

Use 11 or 12 point font, single spaced, 1 inch margins, and Times, Times New Roman, Ariel, or Helvetica font.

Write in a scientific format.

The final paper is due no later than Monday April 30. Papers may be turned in at any time before that date for feedback from the instructor. If a student chooses this option, allow at least 2 weeks for the proposal to be returned to the student.

Grading Criteria for the Proposal and Presentation: 150 points total (25%)

Topic Due Jan 29: 10 points

Written Proposal Due Monday April 30, 4 PM: Grading Criteria for Paper Only:

Format followed: 10 points

One paragraph summary of paper: 10 points

Concise Introduction: 10 points

Logic/Rationale for Experiments: 10 points

Clear Statement of Hypothesis or Question Addressed: 10 points

Experiments, Clear Description: 10 points

Discussion of Results/SO WHAT?: 10 points

References in Standard Format: 10 points

Good Grammar/English: 10 points

Presentation: Grading Criteria for Paper Only:

Concise Introduction: 10 points

Logic/Rationale for Experiments: 10 points

Clear Statement of Hypothesis or Question Addressed: 10 points

Experiments, Clear Description: 10 points

Discussion of Results/SO WHAT?: 10 points

Other information:

January 29th is the 12th day class.

February 23rd is the last day for change in pass/no pass status and the last day to drop a course or withdraw from the University with an automatic W grade for the course. The instructor's policy is to give all students who withdraw a "W" regardless of the reason for the withdrawal.

April 20th is the last day to drop a course with the consent of the instructor.

Friday May 11th is UNT official exam time for Exam 3. The instructor wants to change that time to an earlier time within exam week. This will be discussed in class.

Academic integrity: The university (and the professor) expects the highest standards of academic integrity. A description of the Code of Student Conduct and Discipline is in the student handbook and at http://www.unt.edu/csrr/categories_of_misconduct.htm.

Disabilities: The Department of Biological Sciences complies with the Americans with Disabilities Act. Please see the instructor by the 12th day of class for accomodation if you qualify.