

## **Course Syllabus** **BISC 579 Molecular Genetics**

**Instructor:** Dr. Gregg Roman

groman@olemiss.edu

**Office Location:** Shoemaker Room 214

**Office Hours:** After Class and by  
appointment

**Semester:** Fall 2018

**Lecture:** Shoemaker 408

**Lecture times:** Mon, Wed, Fri 9:00 -9:50

**Course Description:** Molecular Genetics introduces the student to the structure, maintenance and expression of the genome. We will examine both prokaryotic and eukaryotic genomes in this course, with an emphasis on genetic analysis.

**Learning Objectives:** After completing this course, students should be able integrate the structure and function of the genome, describe how gene expression is regulated in multiple paradigms, and be able to understand how genetic analysis is used to dissect complex regulatory processes. Students will be able critically analyze and interpret molecular genetic experiments.

**Textbook:** Molecular Biology of the Gene 7<sup>th</sup> Ed. Watson, et al. Pearson. A PDF is available.

**Attendance:** The students are responsible for all material presented during class. Attendance is required.

**Exams (80% of grade for graduate students, 80% of grade for undergraduates):** There will be three semester exams and one comprehensive final. All exams will be short answer/essay questions. Each exam counts for 25% of the final grade: Students can make-up missed exams only under the following circumstances: 1) family emergency with supporting contact or documentation provided, 2) Illness with physicians note, 3) University-sponsored event with supporting documentation from the sponsoring department. The student needs to contact the instructor either before the exam or within 24 hours after the normally scheduled exam to arrange a time to make-up the exam

**Paper (10% of Grade for Graduate Students/20% for Undergraduates):** Students will write a review paper on one topic in Molecular Genetics. This paper is expected to be at least ten pages, double space, single sided with 1 inch margins. The Student will use Times New Roman or Georgia, 11pt. The student should receive approval of the review paper topic prior to writing. The review should represent a clear and up to date description of the topic. This paper should contain a minimum of 8 references.

**Lecture (10% of Grade for Graduate Students):** Graduate students receiving credit for BISC 570 Molecular Genetics are required to prepare and present one lecture. The lecture will be graded on the basis of clarity of oral presentation, composition of slides, and coverage of topic.

**Grades:** A = 93-100%; A- = 90-92%; B+ = 87-89%; B = 83-86%; B- = 80-82%; C+ = 77-79%; C = 73-76%; C- = 70-72%; D+ = 67-69%; D = 63-66%; D- = 60-62%; F = 59% or less. This scale is non-negotiable.

**Academic Integrity:** Students are expected to abide by the University's policies on academic honesty and conduct:

<https://secure4.olemiss.edu/umpolicyopen/ShowDetails.jsp?istatPara=1&policyObjidPara=108>

[17696](#). Failure to abide by these policies will result in action that may include exam and/or course failure, or even suspension from the University.

**Accommodations:** Whenever possible, and in accordance with Federal 504/ADA guidelines, the University of Mississippi will attempt to provide reasonable academic accommodations to students who request and require them. Please call 662-915-7128 or email [sds@olemiss.edu](mailto:sds@olemiss.edu) for assistance.

### **Class Schedule:**

<b>Date</b>	<b>Lecture</b>	<b>Readings MGB 7th ed.</b>
20-Aug	Course Organization/Introduction	
22-Aug	History of Genetics - Chromosomes	Chapter 1
24-Aug	DNA is the Genetic Material	Chapter 2
27-Aug	DNA Structure I	Chapter 4 pg 78-93
29-Aug	DNA Structure II	Chapter 4 pg 78-93
31-Aug	DNA Topology	Chapter 4 pg 93-103
3-Sep	<a href="#">LABOR DAY (no class)</a>	
5-Sep	Chromosome Structure I	Chapter 8 pg 200-229
7-Sep	Chromosome Structure II	
10-Sep	The Nuclear Environment	
12-Sep	Replication I	Chapter 9
14-Sep	Replication II	Chapter 9
17-Sep	<b>Exam I</b>	
19-Sep	Mutation I	Chapter 10
21-Sep	Mutation II	Chapter 10
24-Sep	Genetic Analysis I	
26-Sep	Genetic Analysis II	
28-Sep	Homologous Recombination	Chapter 11
1-Oct	Site Specific Recombination	Chapter 12 pg 378-392
3-Oct	Genome in Flux	Chapter 12 pg 393-414
5-Oct	Genome in Flux II	

8-Oct	Prokaryotic Transcription	Chapter 13 pg 429-445
10-Oct	Lambda Phage I	Chapter 18 pg 636-651
12-Oct	Lambda Phage II	
15-Oct	<a href="#">On-Line Material (no class)</a>	
17-Oct	<b>Exam II</b>	
19-Oct	Operons	
22-Oct	Eukaryotic Transcription	Chapter 13 pg 448-460
24-Oct	Regulation of Chromatin	Chapter 8 pg 229-254
26-Oct	Transcriptional Activation	Chapter 19 pg 657-681
29-Oct	Transcriptional Activation	
31-Oct	Chromosomal Silencing	Chapter 19 pg 681-697
2-Nov	Chromosomal Silencing	
5-Nov	Transcript Processing I	Chapter 14 pg 467-488
7-Nov	Transcript Processing II	Chapter 14 pg 497-505
9-Nov	Self-Splicing RNAs	
12-Nov	Regulatory RNAs	Chapter 20
14-Nov	<b>Exam III</b>	
16-Nov	Translation	Chapter 15 pg 509-548
19-Nov	Translational Regulation	Chapter 15 pg 549- 558
21-Nov	<a href="#">Holiday</a>	
23-Nov	<a href="#">Holiday</a>	
26-Nov	<a href="#">Holiday</a>	
28-Nov	Enzymes for Mol Bio	
30-Nov	Model Systems	Appendix 1

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27-Aug	DNA Structure I	Chapter 4 pg 78-93
29-Aug	DNA Structure II	Chapter 4 pg 78-92
31-Aug	DNA Topology	Chapter 4 pg 93-103
3-Sep	<a href="#">LABOR DAY (no class)</a>	
5-Sep	Chromosome Structure I	Chapter 8 pg 200-229
7-Sep	Chromosome Structure II	
10-Sep	Nucleus	
12-Sep	Replication I	Chapter 9
14-Sep	Replication II	Chapter 9
17-Sep	<b>Exam I</b>	
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**Final Exam: Wednesday December 5<sup>th</sup>, 8 AM**

**Please Note:** This syllabus is subject to change at the discretion of the instructor to accommodate instructional and/or student needs.