

**Molecular Biology**  
**BIOL 322**  
**Fall 2019**

**Instructor information**

Dr. Varuni Jamburuthugoda  
Office: ISC355  
Office Hours: Wednesdays 10am-12pm, Fridays 9-11am, or by appointment  
Email: [jamburuthugoda@geneseo.edu](mailto:jamburuthugoda@geneseo.edu)  
Office phone: 585-245-5315

**Pre-requisites**

BIOL300 (Cell Biology) and a Biochemistry course (CHEM300 or CHEM 302).

**Course Description**

Molecular Biology is an advanced course focused on genetic and regulatory mechanisms at the cell and molecular level. This course will also emphasize the molecular mechanisms of the flow of genetic information (central dogma of molecular biology) and the regulation of information flow. We will discuss molecular biology techniques and experiments used to study these mechanisms. Classic and current research articles are an important component of the course and will be discussed as a mechanism to evaluate evidence for historical and new models in Molecular Biology.

**Class meetings**

Tuesdays and Thursdays 2.30pm-3.45pm  
ISC 136

**Textbook**

The required textbook is *Molecular Biology: Principles and Practice Second Edition* by Michael M. Cox, Jennifer Doudna and Michael O'Donnell. ISBN-13: 978-1464126147

**Learning Objectives**

Students who complete this course successfully will be able to:

- Demonstrate a solid understanding of molecular biology techniques
- Understand specifically the use of molecular techniques and their application to biological research.
- Explain the fundamental principles of molecular biology, describe, analyze and interpret both classical and modern experiments that contribute to our knowledge of molecular biology
- Describe modern experimental approaches in molecular biology and design experiments to answer current questions in molecular biology

## Attendance

You are required to attend every lecture. Please sign in. Numerous *unexcused* absences will cost you points.

## Exams

Exams will cover lecture topics and research articles discussed in class. The power point slides are posted on Canvas one to two days prior to the lecture. Please remember that online slides by themselves will not adequately prepare you for exams. In class research article discussions are an important component of the course. Exams will include combination of multiple choice, true/false, short answer and essay questions and will challenge you to integrate and apply what you have learned in class.

## Class Participation and Quizzes

Your class participation grade will be determined by the level of involvement and contributions during in class discussions. Each week you can earn 2 points for participation by speaking during class – it is expected that you ask a question, answer a question, or speak up during a discussion at least twice during class every week (hopefully more!). I will be keeping track of participation, and will provide you with feedback midway through the semester on your current participation grade.

There will be 6 quizzes throughout the semester and the lowest quiz grade will be dropped. If you have read the assigned reading material and followed discussions in class, you should not find the quizzes too difficult.

## Evaluation and Grading

3 exams (100 points each)	300 points
Class Participation	30 points
Quizzes (lowest quiz grade will be dropped)	<u>70 points</u>
TOTAL:	400 points

The following scale will be used to calculate final grades. Student point totals or grading scheme maybe adjusted to reflect course difficulty or section differences (instructor's discretion).

A = 100-93%	A <sup>-</sup> =92.9-90%	B <sup>+</sup> = 89.9-87%
B = 86.9-83%	B <sup>-</sup> = 82.9-80%	C <sup>+</sup> = 79.9-77%
C = 76.9-73%	C <sup>-</sup> = 72.9-70%	D = 69.9-60%
F = 59-0%		

## Makeup Exam policy

I will not makeup exams and quizzes unless you have a valid excuse such as an illness or a family emergency. To be fair to everyone in class and to follow departmental and university policies, documentation for such emergencies will be required. If you miss an

exam for any of the above stated exceptions, you must contact me as soon as possible to make alternate arrangements.

### **How to get the most out of this course**

- Read assigned chapters and articles before you come to class.
- Attend every class period.
- Take charge of your own learning. Study for understanding of the concepts, not just memorization of "facts".
- Be alert and take good notes. Go over your notes after class and make extra notes from your reading.
- Consider studying with other students outside of class to discuss the material and prepare for exams.
- Get help when necessary. Feel free to email me anytime or come see me if you need any help.

### **Disability**

Under the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act of 1973, all students, with or without disabilities, are entitled to equal access to the programs and activities of SUNY Geneseo. If you believe that you have a disabling condition that may interfere with your ability to participate in the activities, coursework, or assessment of the object of this course, you may be entitled to accommodations. Students should contact Dean Buggie-Hunt in the office of Disability Services ([tbuggieh@geneseo.edu](mailto:tbuggieh@geneseo.edu) or 585-245-5112) and their faculty to discuss needed accommodations as early as possible in the semester.

### **Academic Honesty and Plagiarism**

All students are expected to follow the specific rules of academic honesty and plagiarism for SUNY Geneseo. Please refer to the 2018-2019 Undergraduate Bulletin for more details.

### **Copyright Protection**

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## Tentative Schedule

Date	Lecture	Topic	Chapter
Aug 27 <sup>th</sup>	1	Molecular Techniques I	7
Aug 29 <sup>th</sup>	2	Molecular Techniques II	7
Sep 3 <sup>rd</sup>	3	Bacterial Transcription I	15
Sep 5 <sup>th</sup>	ARTICLE I Quiz 1		
Sep 10 <sup>th</sup>	4	Bacterial Transcription II	15
Sep 12 <sup>th</sup>	ARTICLE II		
Sep 17 <sup>th</sup>	5	Eukaryotic RNA polymerases and Promoters	15
Sep 19 <sup>th</sup>	ARTICLE III Quiz 2		
Sep 24 <sup>th</sup>	ARTICLE IV		
Sep 26 <sup>th</sup>	EXAM 1		
Oct 1 <sup>st</sup>	6	Eukaryotic Transcription-Epigenetics	Moore and Fan
Oct 3 <sup>rd</sup>	ARTICLE V		
Oct 8 <sup>th</sup>	7	Eukaryotic Transcription-Chromatin Structure	10
Oct 10 <sup>th</sup>	ARTICLE VI Quiz 3		
Oct 15 <sup>th</sup>	Fall Break, No classes		
Oct 17 <sup>th</sup>	Article VII Quiz 4		
Oct 22 <sup>nd</sup>	8	mRNA processing	16
Oct 24 <sup>th</sup>	ARTICLE VIII		
Oct 29 <sup>th</sup>	EXAM 2		
Oct 31 <sup>st</sup>	9	Small regulatory RNA	Troop Chapter 15

<b>Nov 5<sup>th</sup></b>	<b>ARTICLE IX</b>		
<b>Nov 7<sup>th</sup></b>	<b>10</b>	The Genetic code and tRNA	<b>17</b>
<b>Nov 12<sup>th</sup></b>	<b>ARTICLE X</b>		
<b>Nov 14<sup>th</sup></b>	<b>11</b>	Protein synthesis	<b>18</b>
<b>Nov 19<sup>th</sup></b>	<b>12</b>	Transposable Elements	
<b>Nov 21<sup>st</sup></b>	<b>ARTICLE XI</b>		
<b>Nov 26<sup>th</sup></b>	13	Novel RNA biology, CRIPSR	Bhaya review
<b>Nov 28<sup>th</sup></b>	<b>Thanksgiving break</b>		
<b>Dec 3<sup>rd</sup></b>	<b>ARTICLE XII</b>		
	<b>Quiz</b>		
<b>Dec 5<sup>th</sup></b>	<b>Article XIII</b>		
<b>Dec 17<sup>th</sup></b>	<b>FINAL EXAM, 12-2.30pm</b>		

The schedule may change at the discretion of the instructor based on class progression.