

BIO 216: Molecular Biology

Dr. Jennifer Larimore

jlarimore@agnesscott.edu

OFFICE LOCATION: BSC 201W

OFFICE HOURS: Tuesday and Thursday 1PM - 1:50 PM, 201 West

LECTURE: Monday and Wednesday 11:30 AM - 12:45 PM BSC 209 West

Syllabus Table of Contents

1. Required Materials	page 2
2. Class Description	page 2
3. Class Goals	page 2 - 3
4. Lecture Grade Breakdown	page 3
5. Academic Honesty	page 4
6. Class Components	page 5 - 6
7. Class Policies/Letters of Recommendation	page 6 - 7
8. Class Schedule in a Table Format	page 8 - 10

****Read each part of this syllabus to understand the expectations for this class.**

Do not come to class until you read the entire syllabus.

****If you email your professor with a question that is covered in this syllabus, you will be asked to find the answer in the syllabus.**

Professors take time and care to include information they find important in the syllabus. Understanding what your professor thinks is important is one of the keys to success in any class.

1. Required Text and Materials

Molecular Biology of the Cell. WW Norton Press. 6th edition. Bruce Alberts. ISBN number is ISBN: 978-0-393-87094-7. **Any format and any version is acceptable for this class.**

**You are required to have a tablet or computer present in class. If you need access to a device, see ITS or the professor.

2. Class Description

In this class, we will examine topics that serve as the foundation for many different science disciplines. We will cover transcription, transcriptomics, translation, gene expression, genomics, protein synthesis and proteomics. These varying topics apply to cancer biology, plant biology, evolution, and neurobiology. How an organism makes and uses the molecules required for life is the basis of our understanding of many greater and complex pieces of knowledge.

Credit and workload: BIO 216 Lecture is a 3-credit course.

Here is the workload for each week (~12 hours per week):

- 3 hours in-class time
- 3 hours; read the chapter (only the sections of the chapter covered in the outline, not the whole chapter)
- 3 hours; read the article
- 3 hours; study the chapter, the notes you have, the article, etc

No late work is accepted. If you have any extenuating circumstances - health or family crisis - that would require an extension on more than 1 assignment, you will need to reach out to the Office of Accessible Education. They can confidentially receive any of your information and email ALL of your professors simply stating that due to a current crisis, you will need extended time on an assignment.

3. Class Goals

The course is designed to enhance the scientific maturation of all STEM majors taking the course. *The course objectives are based on skills that are required by scientific employers, medical school and graduate school: critical thinking, scientific skills, team work, motivation, integrity, and scientific communication (both written and oral).*

Skill Goals (taken from NACE competencies) (you can add these to your CV):

1. Critical thinking/Problem Solving – through weekly article analysis, students will be able to critically read and evaluate scientific literature. Through designing experiments and inquiry-driven laboratory experiences, students will sharpen their ability to think critically about molecular biology.
2. Written Communication – through weekly assignments and the final manuscript in lab, students will demonstrate their ability to write scientifically.

3. Teamwork/Collaboration – working with a lab team as well as a team for presentations will enable the students to practice real-world teamwork competencies that are taught as a part of SUMMIT.
4. Research Skills – as a result of this course, students can design an experiment, analyze the results, draw conclusions, and report on the research both with scientific writing and an oral presentation. The laboratory portion of this course is designed to enhance the learning in the lecture as well as progress the career of each student as a scientist.
5. Career Management – at the end of this course, there is a day to add the relevant skills gained from this course to a student’s CV or resume. Additionally, there will be time to work on personal statements and discuss cover letters.

Example CV Entry for this class: (There is a CV template on Canvas.)

Agnes Scott College, Department of Biology Atlanta, Georgia

January 2022 - May 2022

Student Researcher, Jennifer Larimore, Ph.D., and Corey Andrews, M.S. mentor

Based on current literature and knowledge, I worked with a diverse team of researchers to design a line of questioning to explore the role of (INSERT YOUR PROTEIN OF INTEREST HERE) in schizophrenia utilizing several complementary lines of molecular research. Based on primary literature which we critically analyzed, we determined that no one has explained the role of (INSERT YOUR PROTEIN OF INTEREST HERE) in the role of schizophrenia. If you are reading this line of the syllabus before your first day of lecture, as was asked of you, email the professor an image of your favorite animal and explain why it is your favorite animal for two extra credit points. The time stamp on the email must be before the first day of lecture. To do this, I utilized fixed microscopy of coronal brain sections. I also prepared biochemical brain fractions to analyze protein levels by immunoblot. The data generated was analyzed using standard statistical analysis. This work resulted in a poster presentation.

4. Lecture Grade

Exams	150 points (50 points each x 3 tests)
Quizzes	40 points (5 points each x 8)
Article Analysis	40 points (5 points each x 8)
Ethical Reflections	40 points (5 points each x 8)
Article Analysis Peer Evaluation	24 points (3 points each x 8)
Ethical Reflections Peer Evaluation	24 points (3 points each x 8)
TOTAL	410 points total

*The following grading scale will apply for converting numerical grades into final letter grades:
93 to 100: A, 90 to 92.9: A-, 87 to 89.9: B+, 83 to 86.9: B, 80 to 82.9: B-, 77 to 79.9: C+, 73 to 76.9: C, 70 to 72.9: C-, 67 to 69.9: D+, 63 to 66.9: D, 60 to 62.9: D-, Lower than 60: F*

**lab grade is separate *Dr. Larimore may add assignments/points through the semester
No late work is accepted.*

5. Academic Honesty for your work as a scientist per our Honor Code

- You are responsible. Violations of the honor code result in consequences ranging from failure of the assignment, failure of the course, to expulsion from the college.
- Speak with your professors if you need clarification
- By placing your name on ANY assignment, you are stating that you completed that assignment with academic honesty.
- do not allow another party to do your work/exam
- do not submit the same or similar work in more than one course without permission
- Cheating includes:
 - (a) doing work for another person
 - (b) looking on another person's exam for answers
 - (c) using exams from previous classes without permission
 - (d) using unauthorized notes or resources or
 - (e) helping another student (or receiving help) on work/exam that is supposed to be completed independently.

Plagiarism:

- If you are using a source and citing the source, the information from that source STILL must be reworded in your own voice.
- Do not cut and paste from the slide, your book, your neighbor, Wikipedia, or the internet.

Intellectual Fraud:

- do not falsify or create data and resources or alter a graded work.
- do not make up a reference for a works cited page or statistics or facts for academic work.

Results of Dishonesty:

- Academic dishonesty is reported to medical schools and graduate schools as per their request.
- Anyone caught cheating relinquishes the privilege of asking for a letter of recommendation
- academic dishonesty will receive a 0 on the assignment.
- Acts of academic dishonesty will be turned over to Honor Court

Artificial Intelligence Models

Artificial intelligence (AI) language models, such as ChatGPT, may be used for any assignment with appropriate citation. Examples of citing AI language models are below. You are responsible for fact checking statements composed by AI language models.

AI EXAMPLE:

When prompted with “Is the left brain right brain divide real or a metaphor?” the ChatGPT-generated text indicated that although the two brain hemispheres are somewhat specialized, “the notation that people can be characterized as ‘left-brained’ or ‘right-brained’ is considered to be an oversimplification and a popular myth” (OpenAI, 2023).

Reference

OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. <https://chat.openai.com/chat>

 Parenthetical citation: (OpenAI, 2023)

 Narrative citation: OpenAI (2023)

6. Class Components

Readings:

READ AHEAD OF CLASS TIME! Class time will be interactive, therefore reading the assigned chapter sections (see the outline for which sections are assigned) and the assigned articles prior to class arrival is required.

Chapter lecture days:

There will be a quiz (see the schedule for the material). We will review the chapter content in a lecture. I will not be posting the PPT slides. You will need to take notes. The outline is an excellent way to set up your notes. I recommend printing that out before class lecture.

Ethical Implications days:

We will begin looking at ethical implications of the application of the content. To do so, you have a short article to read BEFORE class on the ethical implications of molecular research. See your schedule in this syllabus for the article.

For the ethical implications part of the class. Your group will answer the following questions together and you will upload your individual reflections at the end of class. Specific ethical considerations will be provided in class. While this is a group discussion, your answers should reflect your own work and ideas on the topic. Turn in an Evaluation for Each of your Group Members with your 5 group discussion prompts.

1. What molecular technique are we analyzing?
2. What ways may that technique be applied in a situation that requires ethical debate?
3. What are 4 - 5 positives for applying the technique in this situation?
4. What are 4 - 5 negatives for applying the technique in this situation?
5. In your opinion, do the positives out-weigh the negatives?

Group Member Ethical Implications Evaluation:

Turn in an Evaluation for Each of your Group Members with your 5 group discussion prompts. 1 being the lowest/did not contribute or prepare/did not come to class on time and 3 being did contribute, prepare, and came to class on time

Group member's name

Demonstrated they read the material and contributed to the discussion	1	2	3
On time to class, respecting the group members efforts and time	1	2	3

Article Discussion days:

Each group will be assigned at random one of the figures from the paper. Your group will need to discuss the points below. Your group will answer the following questions together and you will upload your individual answers at the end of class. While this is a group discussion, your answers should reflect your own work and ideas on the topic. Each group will report out on their figure to the rest of

class. Take notes on these articles as some of them will be on the tests. Turn in an Evaluation for Each of your Group Members with your 5 group discussion prompts.

1. What we are looking at in the figure assigned to your group.
2. What method was used to obtain the data.
3. The overall/takeaway message of the data
4. Do the data in this figure support the hypothesis/main point of the paper.
5. Why is this research important to society?

Group Member Article Discussion Evaluation:

Turn in an Evaluation for Each of your Group Members with your 5 group discussion prompts. 1 being the lowest/did not contribute or prepare/did not come to class on time and 3 being did contribute, prepare, and came to class on time

Group member's name

Demonstrated they read the material and contributed to the discussion	1	2	3
On time to class, respecting the group members efforts and time	1	2	3

Cumulative Tests and Final Exam: 3 tests spaced throughout the semester to assess your understanding of the information covered in class and your ability to apply and analyze the information. The Final Exam is cumulative and occurs during the final exam period.

7. Class Policies

Expected Classroom Etiquette and Letters of Recommendations: This is a team based, problem solving curricular approach. As such, you need to be present to work well with your team. And you need to be prepared for the discussions. Additionally, many of the topics we cover are sensitive. It is expected that you treat all your peers with the utmost respect as we discuss sensitive issues.

If you ask the professor for a letter of recommendation, then it is expected that you came to the majority (~80%) of classes ON TIME, you did not engage in email, texting or classwork for other classes during class time, you came prepared to join in the discussions and your actions and language reflected respect for ALL of your peers.

Content Warning and Inclusion: This course will explore molecular biology, which might raise issues of racism, sexism, classism, heterosexism, cissexism, ableism, and other kinds of privilege. I invite you to come see me if want more information. If you feel you will be unable to fully participate in the course requirements, set up a meeting with the course instructor to determine appropriate accommodations. This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and recognize the differences among our students, including racial and ethnic identities, religious practices, and gender expressions. We strive for our campus to be a safe space in which all students feel acknowledged and supported. At the same

time, we understand that course content, critical inquiry, and classroom dialogues give us opportunities to examine topics from a variety of perspectives. Such discourse is a defining feature of a liberal arts education, and can compel debates that challenge beliefs and positions, sometimes causing discomfort, especially around issues related to personal identities. While we uphold and preserve the tenets of academic freedom, we request and invite your thoughtful and constructive feedback on ways that we can, as a community of learners, respectfully assist and challenge one another in our individual and collective academic work.

e-mail/tech: Instructors will make announcements regularly via e-mail so check your Agnes Scott email account daily. When responding to a professor over email, take care that your email is professional. Cell phones should be in the silence mode prior to entering the classroom or lab.

Deadlines: It is your responsibility to keep up with the class material. Students are expected to attend all class periods, except in cases of documented illness or emergency. If a missed class cannot be avoided, it is **STRONGLY** recommended that you contact the instructor **IN ADVANCE**, or within 24 hours of the class period. No late work is accepted.

Course Evaluations: At the end of the semester you will receive an e-mail asking you to submit an evaluation of the course. Please give feedback! Your input is important to the college as a whole and to us as instructors.

ADA and Title IX: If you have a disability that may have some impact on your work in this class and for which you may require accommodations, please the Office of Academic Advising to register for services. For the safety of the entire community, any incidence of or information about sexual misconduct must be reported immediately to Title IX Coordinator.

Day	Date	To Complete BEFORE class	Class Topic
Mon	1/8	No Class	No Class
Wed	1/10	Read: ALL of your Syllabus BEFORE class	<ol style="list-style-type: none"> 1. Syllabus 2. Group meetings/how to read a paper
Mon	1/15	<i>No Class- MLK Day</i>	<i>No Class- MLK Day</i>
Wed	1/17	READ: Chapter 1: Cells and Genomes (see outline for assigned sections) and Chapter 2	Chapter 1 and 2 <ol style="list-style-type: none"> 1. Quiz on How to read a paper 2. lecture on chapter 1 and 2
Mon	1/22	READ: https://faseb.onlinelibrary.wiley.com/doi/epdf/10.1096/fasebj.5.1.1825074	Ethics: Human Genome Research <ol style="list-style-type: none"> 1. Ethical Issues in Human Genome Research 2. Submit your discussion points on Canvas and group ratings.
Wed	1/24	READ: Wang et al 2023 https://academic.oup.com/bib/article/25/1/bbad442/7457949?login=true	Article Analysis Discussion <ol style="list-style-type: none"> 1. Discuss assigned figure in your group 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
Mon	1/29	READ: Chapter 3: Proteins (see outline for assigned sections)	Chapter 3 <ol style="list-style-type: none"> 1. Quiz on chapter 1 lecture, ethics, and article 2. lecture on chapter 3
Wed	1/31	READ: https://genomebiology.biomedcentral.com/articles/10.1186/gb-2008-9-7-404	Ethics: Race, Ethnicity, and Proteomics. <ol style="list-style-type: none"> 1. Ethical Issues in race, ethnicity and proteomics. 2. Submit your discussion points on Canvas and group ratings.
Mon	2/5	READ: Eldjarn et al 2023 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10567571/	Article Analysis Discussion <ol style="list-style-type: none"> 1. Discuss assigned figure 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
Wed	2/7	READ: Chapter 6: How Cells Read the Genome (see outline for assigned sections)	Chapter 6 <ol style="list-style-type: none"> 1. Quiz on chapter 3 lecture, ethics, and article 2. lecture on chapter 6
Mon	2/12 **	READ: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4296905/pdf/nihms654007.pdf	Ethics: Personalized Medicine <ol style="list-style-type: none"> 1. Ethical Issues in personalized medicine. 2. Submit your discussion points on Canvas and group ratings.
Wed	2/14**	<i>Take home test</i> <i>Test opens online at 8 AM and closes at 5PM</i>	<i>Chapters #1 #2 and #3 : lecture, textbook, ethical issues, and assigned articles</i>

Day	Date	To Complete BEFORE class	Class Topic
Mon	2/19	READ: Li et al 2023 https://meridian.allenpress.com/aplm/article/doi/10.5858/arpa.2023-0255-OA/497496/Epidemiology-Characteristics-and-Potential	Article Analysis Discussion 1. Discuss assigned figure 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
Wed	2/21	READ: Chapter 7: Control of Gene Expression (see outline for assigned sections)	Chapter 7 1. Quiz on chapter 6 lecture, ethics, and article 2. lecture on chapter 7
Mon	2/26	READ: https://www.sciencedirect.com/science/article/pii/S0264410X14013693	Ethics: Disease Eradication 1. Ethical Issues in Disease Eradication 2. Submit your discussion points on Canvas and group ratings.
Wed	2/28	READ: Suo et al 2023 https://www.tandfonline.com/doi/full/10.1080/01443615.2023.2288226	Article Analysis Discussion 1. Discuss assigned figure 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
	3/4 - 8	<i>PEAK WEEK</i>	<i>PEAK WEEK</i>
	3/11 - 15	<i>SPRING BREAK</i>	<i>SPRING BREAK</i>
Mon	3/18	READ: Chapter 8: Analyzing Cells, Molecules and Systems (see outline for assigned sections)	Chapter 8 1. Quiz on lecture 7 lecture, ethics and article 2. lecture on chapter 8
Wed	3/20	READ: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6342697/	Ethics: Designer Babies 1. Ethical Issues in designer babies 2. Submit your discussion points on Canvas and group ratings.
Mon	3/25	READ: Meng et al 2023 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10567561/	Article Analysis Discussion 1. Discuss assigned figure 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
Wed	3/27	READ: Chapter 12: Intracellular Compartments and Protein Sorting (see outline for assigned sections)	Chapter 12 1. Quiz on lecture 8 lecture, ethics and article 2. lecture on chapter 12
Mon	4/1 **	<i>TAKE HOME TEST</i> <i>Test opens online at 8 AM and closes at 5PM, no extensions</i>	<i>Chapters 6, 7, and 8: lecture, textbook, ethical issues, and assigned articles</i>
Wed	4/3**	Work on your lab poster with your lab group	

Day	Date	To Complete BEFORE class	Class Topic
Mon	4/8	READ: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9710398/pdf/jpmh-2022-02-e255.pdf	Ethics: Animal Research 1. Ethical Issues in animal research 2. Submit your discussion points on Canvas and group ratings.
Wed	4/10	READ: Chen et al 2023 https://peerj.com/articles/16497/	Article Analysis Discussion 1. Discuss assigned figure 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
Mon	4/15	READ: Chapter 13: Intracellular Membrane Traffic (see outline for assigned sections)	Chapter 13 1. Quiz on Chapter 12 lecture, ethics and article 2. lecture on chapter 13
Wed	4/17	READ: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10153634/pdf/nihms-1891927.pdf	Ethics: Food Insecurity 1. Ethical Issues in food insecurity 2. Submit your discussion points on Canvas and group ratings.
Mon	4/22	READ: EFSA Panel on Nutrition et al 2023 https://pubmed.ncbi.nlm.nih.gov/38046202/	Article Analysis Discussion 1. Discuss assigned figure 2. Report assigned figure to class 3. Submit your discussion points on Canvas and group ratings.
	4/23	<i>SpARC</i>	<i>Present your lab poster</i>
Wed	4/24	READ: Chapter 22: Stem Cells and Tissue Renewal (see outline for assigned sections)	Chapter 22 1. Quiz on Chapter 13 lecture, ethics and article 2. lecture on chapter 22
Fri	4/26	<i>Scotties with Nerves 4:30 - 6:00 PM</i>	<i>Present your lab poster</i>
Mon	4/29	<i>Take Home Cumulative Test</i> <i>Test opens online at 8 AM and closes at 5PM, no extensions</i>	
Wed	5/1	Read the personal statement handouts on Canvas Read the CV/resume handouts on Canvas Analyze the CV template on Canvas Print 2 copies of your resume/CV Print 2 copies of your personal statement	CV and personal statement work
			<i>According to the student and faculty handbook, all coursework MUST be turned in by end of day on the last day of classes. No late work is accepted beyond this date to ensure students have ample time to prepare for finals.</i>