# BIOL 322, Molecular Biology, Fall 2025

Biology 322, 3.0 credits
Tues and Thurs: 9:30-10:45 AM, Newton 212
Prerequisites: BIOL 222 (Genetics), Genetics lab is recommended
Prerequisite or corequisite: a Biochemistry course (CHEM 300, CHEM 302, BIOL 335)
*Biology students with a D or less in pre or corequisite courses will be deregistered

Instructor

**Dr. Kevin T. Militello (Dr. M.)**
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Office hours: Mondays from 8:15-9:15 AM, Tuesdays from 8:15-9:15 AM, Thursdays from 8:15-9:15 AM, or by appointment

Course Description

Molecular Biology is an advanced course focused on genetic mechanisms at the cellular and molecular level. The primary emphasis of the course is the flow of genetic information (Central Dogma of Molecular Biology) and the regulation of information flow. Classic and current research articles, an important component of the course, are discussed as a mechanism to evaluate evidence for historical and new models in Molecular Biology.

End of Course Learning Outcomes

At the conclusion of the course……..
*students will be able to explain the fundamental principles of molecular biology at the level appropriate for senior Biochemistry and Biology majors.
*students will have practiced problem solving, critical thinking, and communication skills both generally and with respect to molecular biology topics.
*students will be able to describe, analyze, and interpret both classical and modern experiments that contribute to our knowledge of molecular biology.
*students will be able to describe modern experimental approaches in molecular biology and design experiments to answer current questions in molecular biology.

Textbook

The required text for the course is Molecular Biology: Principles of Genome Function by NL Craig, R Green, C Greider, G Storz, C Wohlberger, and O Cohen-Fix (3rd edition, Oxford University Press, ISBN 9780198788652). The textbook will only be used for 50% of the classes, so an etext or sharing a text with a friend may suffice. Readings from other texts will be provided on Brightspace as .pdf files.

Course Notes

*Students are expected to check their email/Brightspace announcements at least once a day for course information.
*Attendance will be taken at each class/session.
*Grade disputes must be initiated within 7 days from the date the assignment is handed back.

Grading

| | |
|---|---|
| 3 examinations @ 100 points each[#] | 250 points |
| 6 quizzes @ 10 points each (drop one) | 50 points |
| homework | 30 points |
| class participation* | 20 points |
| | 350 points total |

[#] The lowest exam will be weighted at 50% (50 points).

*A statement describing your expected class participation score and evidence thereof will be due at the end of the course (details to follow). Note: class participation is NOT the same as class attendance.

The following scale (minimum averages) will be used to calculate final grades. Student point totals or grading scheme may be adjusted to reflect course difficulty or section differences (instructor's discretion), but are not typically adjusted.

A, 94; A-, 90
B+, 87; B, 84; B-, 80
C+, 77; C, 74; C-, 70
D, 65; E, < 65

How to excel in BIOL 322

Each student is unique, learns by different mechanisms, and has a different background. Thus, there is no one, magical formula for success in this or any course. However, these are some general pieces of advice that are likely important for most students.

*Attend class each session. Although this is a bit cliché, there is no way to replicate our discussions of research articles if you miss class for any reason. Also, it will be difficult for you to argue for a strong class participation score if you do not attend.
*Get help when necessary. We generally keep this class at 20 students or less, so getting help is feasible. It might feel uncomfortable, but don't be shy.

*Read, Read, Read. It might take a couple of times for some of the reading assignment topics to stick. This is normal. Be patient and leave extra time for required reading.

Students With Disabilities

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional or learning disabilities. Students should consult with the Office of Accessibility (Erwin 22, access@geneseo.edu) and their individual faculty (Dr. M.) regarding any 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 2025-2026 Undergraduate Bulletin for more details.

Physical and Mental Health

We take physical and mental health seriously, yet do not likely understand the unique challenges each student faces. If you have to miss class, please contact your instructor (Dr. M.) for a make up strategy. See Brightspace as well. For all emergencies, call University Police at 585-245-5222 or 911.

Copyright Protection

| Date | Quiz | Lecture | Reading |
|---|---|---|---|
| 8/26/2025 | | Molecular Techniques 1 | Craig ch19, 835-945 (parts), online access |
| 8/28/2025 | | Molecular Techniques 2 | Craig ch19, 835-945 (parts), online access |
| | | | |
| 9/2/2025 | | Bacterial Transcription 1 | Craig ch8, 305-340; Cox ch15, 519-531, Cox ch7, 237-238 |
| 9/4/2025 | yes | | Article 1 |
| | | | |
| 9/9/2025 | | Bacterial Transcription 2 | Craig ch8, 305-340; Cox ch15, 531-536 |
| 9/11/2025 | quiz back | | Article 2 |
| | | | |
| 9/16/2025 | | Eukaryotic Transcription 1 | Craig ch8, 305-340; Tropp ch13, 466-491 |
| 9/18/2025 | yes | | Article 3 |
| | | | |
| 9/23/2025 | quiz back | | Article 4 |
| 9/25/2025 | | Exam 1 | |
| | | | |
| 9/30/2025 | | Eukaryotic Transcription 2 | Craig ch4, 139-142; Moore and Fan, 23-30 |
| 10/2/2025 | exam back | | Article 5 |
| | | | |
| 10/7/2025 | | Eukaryotic Transcription 3 | Craig ch4, 117-139; Cox ch10, 331-342 |
| 10/9/2025 | yes | | Article 6 |
| | | | |
| 10/14/2025 | | NO CLASSES, FALL BREAK | |
| 10/16/2025 | quiz back | | Article 7 |
| | | | |
| 10/21/2025 | | mRNA processing | Craig ch10, 395-421 |
| 10/23/2025 | yes | | Article 8 |
| | | | |
| 10/28/2025 | quiz back | | Article 9 |
| 10/30/2025 | | Exam 2 | |
| | | | |
| 11/4/2025 | | Small Regulatory RNAs | Craig ch13, 529-548; Tropp ch 15, 600-619 |
| 11/6/2025 | exam back | | Article 10 |
| | | | |
| 11/11/2025 | | Translation 1 | Craig ch11, 434-475; Cox ch17, 589-604 |
| 11/13/2025 | yes | | Article 11 |
| | | | |
| 11/18/2025 | | Translation 2 | Craig ch11, 434-475 |
| 11/20/2025 | quiz back | | Article 12 |
| | | | |
| 11/25/2025 | | Novel RNA Biology, CRISPRs | Craig ch13, 549-556; Bhaya review |
| 11/27/2025 | | NO CLASSES, THANKSGIVING BR. | |
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|---|---|---|---|
| 12/2/2025 | yes | | Article 13 |
| 12/4/2025 | quiz back | | Article 14 |
| | | | |
| 12/11/2025 | | Exam 3, 800-1030 AM | |