

BIOL 4801/BIOL 5800- MICROBIAL GENETICS
Spring 2026, M W F 1:00 PM – 1:50 PM, GAB 317

Office hours: Wednesdays 2:00 PM -3:00 PM, LifeA 359 and by appointment.

Instructor: Rohan Balakrishnan (rohan.balakrishnan@unt.edu)

The course covers genetic structure, inheritance and gene expression in microbes and their viruses. It also discusses modern approaches in microbial genetic manipulations.

Suggested material: Molecular Genetics of Bacteria (5th edition), Henkin and Peters

Syllabus:

Week	Section	Topic	Subtopics
1	1	Intro, Chromosome	DNA, base pairs, Replication
2		Chromosome, Transcription	Replication, mRNA synthesis, RNA pol
3		Transcription, Translation	Promoters, sigma, Protein Synthesis
4		Translation, Test 1	Ribosomes, codons, tRNA, section1
5	2	Inheritance	Luria-Delbruck, Lederberg, mutation rates
6		Mutations	Types of mutations, crosses, mapping
7		Plasmid, Vectors, Cloning	Types, molecular biology of plasmids
8	3	Vector, Phage, Test 2	Vector molecular biology, Lysis, section 2
9		Phages	Lysogeny, infection, CRISPR
10		Phages, Transposons	Phage tools, transposition, genomics, mutagenesis
11	4	Recombination, Repair	Mechanisms and types, General repair
12		Repair, Regulation, Test 3	Specific Repair, CCR, Section3-4
13	5	Regulation	Nitrogen response, ribosomes, stress response
14		Regulation, Genomic analysis	Virulence, sporulation, Sanger, PCR
15	6	Genomic analysis	Deep sequencing, cloning, assembly
16		Revise, Final Test	Sections 1-6

Please note that the schedule is tentative and is subject to minor changes.

Grading: Students taking BIOL 4801 will be graded on a total of 1000 points. There will be three sectional tests of 250 points each. There will be one comprehensive Final test for 500 points. For final grades, the score on the final test and the best two scores from the sectional tests will be considered. Tests will be a mix of multiple choice questions, and descriptive questions and all tests will be in-person.

Grading for BIOL 5800: In addition to the sectional and Final tests adding to 1000 points, students registered for BIOL 5800 are required to take on a class presentation (15 minutes on a paper assigned on either section 2 or 3) for 100 points, and an open book test on a research article related to section 6 for 100 points. So a total of 1200 points.

Grade Scale:

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

Final grades are calculated based on the percentage of the total points earned. The scores will not be curved.

Attendance:

Attendance is mandatory and, therefore, expected. Attendance will be recorded during each class. No make-up review sessions will be offered to students who consistently remain absent.

Exams make-up policy:

Exams should be taken as schedule. No makeup examinations will be allowed except for documented emergencies. See Policy Chapter 6 Faculty Affairs – Policy # 06.039 Student Attendance and Authorized Absences. (<https://policy.unt.edu/policy/06-039>)

Academic integrity:

The University (and the professors!) 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/student_conduct.htm. Students are expected to abide by the University's code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to the UNT Dallas Academic Integrity Policy in the appropriate Catalog at <http://dallascatalog.unt.edu>.

Academic dishonesty includes but is not limited to, cheating, plagiarizing, fabrication of information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor or tampering with the academic work of other students. Plagiarism of any sort on any assignment or exam **WILL** result in a grade of zero for that assignment.

Important dates (registering, dropping, etc):

<http://registrar.unt.edu/registration/fall-registration-guide>

Disabilities:

The Department of Biological Sciences complies with the Americans with Disabilities Act. If you qualify, please see the instructor by the 12th day of class for accommodation.

The University of North Texas makes reasonable academic accommodations for students with disabilities. Students seeking accommodations must first register with the Disabilities Services Office (DSO) to verify their eligibility. If a disability is verified, the DSO will provide you with an accommodation letter to be delivered to the faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time; however, DSO notices of accommodation should be provided as early as possible during the semester to avoid any delays in implementation. Note that a student must obtain a new letter of accommodation for every semester and must meet/communicate with each faculty member before implementation in each class. Students are strongly encouraged to deliver letters of accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, see the Disability Services Office website at <https://studentaffairs.unt.edu/office-disability-access/index.html>

Prohibited Use of Generative AI (GenAI) Software

The use of Generative AI (GenAI) tools like Claude, ChatGPT, and Gemini is not permitted. While these tools can be helpful in some contexts, they do not align with our goal of fostering your independent thinking. Using GenAI to complete any part of an assignment, exam, or coursework will be considered a violation of academic integrity, as it prevents the development of your own skills, and will be addressed according to the Student Academic Integrity policy.

For this course, tools like Grammarly, predictive text, speech-to-text, and translation tools are considered forms of GenAI, as they blur authorship and are therefore not allowed. All work must be your own.

Disruptive Behavior in an Instructional Setting:

Students are expected to engage with the instructor and other students in this class in a respectful and civil manner at all times to promote a classroom environment that is conducive to teaching and learning. Students who engage in disruptive behavior will be directed to leave the classroom. A student who is directed to leave class due to disruptive behavior is not permitted to return to class until the student meets with a representative from the Dean of Students Office. It is the student's responsibility to meet with the Dean of Students before class meets again and to provide the instructor confirmation of the meeting. A student who is directed to leave class will be assigned an unexcused absence for that class period and any other classes the student misses as a result of not meeting with the Dean of Students. The student is responsible for material missed during all absences and the instructor is not responsible for providing missed material. In addition, the student will be assigned a failing grade for assignments, quizzes, or examinations missed and will not be allowed to make up the work.

The Code of Student's Rights, Responsibilities, and Conduct (Policy 7.001) describes disruption as the obstructing or interfering with university functions or activity, including any behavior that interferes with students, faculty, or staff access to an appropriate educational environment. Examples of disruptive behavior that may result in a student being directed to leave the classroom include but are not limited to: failure to comply with reasonable directives of University officials, action or combination of actions that unreasonably interfere with, hinder, obstruct, or prevent the right of others to freely participate, threatening, assaulting, or causing harm to oneself or to another, uttering any words or performing any acts that cause physical injury, or threaten any individual, or interfere with any individual's rightful actions, and harassment. You are encouraged to read the Code of Student's Rights, Responsibilities, and Conduct for more information related to behaviors that could be considered disruptive.