

Advanced Bacteriology

GMS 6109

Fall 2024

2 credit hours

Online

Course director:

Jennifer Boddicker, Ph.D.

Lecturer

Department of Molecular Genetics & Microbiology

College of Medicine

jboddicker@ufl.edu

Office Hours: Variable including evenings and weekends. Please schedule by email.

Course Website: <https://ufl.instructure.com>

Course Communications: Communication from the faculty to the students will be made via the Announcements section of the Canvas web page. Students are expected to review this section once per day to keep informed of communications. Announcements automatically send an email to the UF Gatorlink email address of enrolled students, so students should also check their UF Gatorlink email once per day. **DO NOT USE CANVAS EMAIL. USE GATORLINK EMAIL.**

Recommended Texts (both are available as e-texts and are HIGHLY recommended):

- Snyder and Champness Molecular Genetics of Bacteria, 5th Edition, Henkin and Peters., ASM Press, 2020.
- Antibiotics: challenges, mechanisms, opportunities. Christopher T. Walsh and Timothy A. Wencewicz. ASM Press, 2016.

Additional Resources: A good microbiology textbook, such as the required textbook from GMS 6121 (Schaechter's Mechanisms of Microbial Diseases. 6th ed., Lippincott William & Wilkins), would be helpful. There are also excellent online resources to help fill in gaps.

Course Description: Advanced bacteriology in two modules. The first module covers bacterial genetics (e.g., gene expression and regulation, plasmids and bacteriophages, genetic engineering and genetic analysis) and physiology (e.g., DNA replication, protein production and localization, biofilms). The second module covers antibiotics (e.g., classes of antibiotics and their mechanisms of action) and antibiotic resistance (e.g., mechanisms).

Prerequisite Knowledge and Skills: This course is designed to follow GMS 6121 Infectious Diseases, which includes a very brief introduction to bacterial structure, physiology, and genetics aimed at students who have not taken formal microbiology courses. GMS 6108 builds upon that introduction. **Therefore, this course is also appropriate for students who either majored in microbiology or took a comprehensive undergraduate microbiology course. The introductory lecture**

materials from GMS 6121 are provided online so that students can bring themselves up to speed before beginning this course. Finally, an online quiz as a preliminary assignment will ensure that students comprehend the prerequisite knowledge, even those who took GMS 6121. If a prospective student has concerns about taking GMS 6xxx, they should contact the course director.

Course Goals and/or Objectives: By the end of this course, students will be able to:

- Describe differences in cell structure among different classes of bacteria
- Relate how cell structure and composition affect the biology and genetics of the bacteria
- Describe in detail the process of gene expression from transcription to translation to secretion and identify the genetic elements involved with these processes
- Relate chromosomal DNA replication to different models of plasmid DNA replication and use this information to explain the biology and use of representative plasmids
- Describe the life cycles and replication mechanisms of representative bacteriophages
- Creatively use plasmids and phages in manipulation of bacterial genomes
- Describe the regulation of transcription from the most basic paradigms to more complicated models of regulation
- Understand history of antibiotics
- Describe mechanisms of antibiotic action affecting a variety of pathways
- Explain acquired and intrinsic resistance mechanisms
- Describe the use of phage and other entities as non-conventional therapeutic agents

Teaching Philosophy: My teaching philosophy for graduate students is that we are a team moving forward in education. I will do my best to teach the relevant material in the most effective manner. I expect students to participate in their own education by studying assigned materials, completing assignments, and asking for help in a timely manner having attempted to seek answers on their own using available resources.

Instructional Methods: Recorded lectures in the form of narrated PowerPoints will be posted along with a brief homework/quiz to enforce timely viewing and study of the lecture.

Course Policies:

Attendance Policy: Attendance constitutes viewing lecture videos and completing homework/quizzes. If a student cannot participate online in the set times, they should communicate the issues with the relevant faculty member. Course attendance policies are in accordance with UF policy on attendance: (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>).

Assignment Policy: There are homework quizzes (one for each lecture - formative feedback) and two exams (one for each module - summative feedback).

Homework quizzes: Every lecture has a 5-question multiple choice homework quiz with a specified due date indicated on the assignment in Canvas. Usually that is 11:59 pm on the Sunday following the lecture. This gives maximum flexibility for completing the week's homework assignments. Homework quizzes are open book, open note, but not collaborative. Collectively, the homework quizzes count for 40% of the final grade. Unless a student has a university-allowed reason for missing an assignment (see above), a grade penalty of at least 20% may be levied against late assignments.

Exams: There are two exams – one for each module of the course.

The exams are closed book, closed note, multiple choice, with questions similar to the quizzes. **Exams will be administered via Honorlock. Students MUST have a side view camera which shows their entire desk area on both sides of their computer as well as their hands to take the Honorlock exams, as illustrated in examples in the Introduction section of Modules. Students who do not comply are subject to 50% deduction for every exam where they are out of compliance. Students are expected to be familiar with the procedures for having all of the necessary hardware and software to take the exams via Honorlock. There is a 3-day window for scheduling each exam.**

Make-up Policy: If a student misses an assignment such as a homework or quiz, it may be made up according to University of Florida policy for allowable excused absences (<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>). **If you experience life issues that hinder your ability to take an exam, contact the course director for possible accommodations. It is better to seek help ahead of time than after you experienced a problem on an exam. There is no make-up or extra credit.**

Grading Policies:

The final grade will be calculated as follows:

Exams 60% (30% each)

Homework/quizzes 40%

Grading Scale: The default grading scale for the class is: A ≥ 90 , A- 87-89.9, B+ 84-86.9, B 80-83.9, B- 77-79.9, C+ 74-76.9, C 70-73.99, C- 67-69.9, D+ 64-66.9, D 60-63.99, D- 57-59.9, E ≤ 56.9 . This scale may be shifted downward, but it will never be shifted upwards. See the UF policy on grades at: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Weekly Schedule

Can be found in Modules.

UF Policies:

University Policy on Accommodating Students with Disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Here is the link to get started with the Disability Resource Center (<https://disability.ufl.edu/get-started/>). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

University Policy on Academic Misconduct: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class. Students should be sure that they understand the UF Student Honor Code at <https://sccr.dso.ufl.edu/process/student-conduct-code/>.

Plagiarism: When writing discussion posts, if you use Ctrl-C from someone else's writing and you change every other word, this is plagiarism and, you will get caught. I use Turnitin.com to check for plagiarism. If you plagiarize, I will give you the harshest grade penalty and file an academic honesty report with the Dean of Students.

Course/Faculty Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

GETTING HELP:

For issues with technical difficulties for Canvas, please contact the UF Help Desk at:

Learning-support@ufl.edu

- (352) 392-HELP
- <https://lss.at.ufl.edu/help.shtml>

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date

of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

In-Class Recording:

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

CAMPUS RESOURCES:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website. University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.