BACTERIAL PATHOGENESIS (BIOL 464/664) Fall 2021



Course Description

This course for upper division and graduate students will address the molecular mechanisms by which bacterial pathogens cause disease. Bacterial infections will be considered as molecular interactions between hosts and their infecting microbes. We will consider some of the basic principles of bacterial pathogenesis before conducting a survey of the pathogens and their specific virulence factors. The course will also include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions.

Course Objectives

By taking this course, students should:

- Understand the importance natural flora plays in defending our body against bacterial pathogens
- Understand the basics of innate and adaptive immune responses
- Appreciate which bacterial structures are commonly seen associated with bacterial pathogens and how these function in disease
- Understand the bacterial mechanisms commonly used to avoid the immune system
- Understand the different environments of the human body and how pathogens exploit these environments to colonize and cause disease

Instructor's Contact Details

Lecturer: Dr. Helen Wing, Associate Professor, School of Life Sciences

Email: helen.wing@unlv.edu

Phone: 895-5382 Office: WHI 307

Office Hours: Friday 4-5pm using Webex

Website: Dr. Wing's website can be reached at http://www.unlv.edu/faculty/hjwing

Lectures

Will be recorded by Panopto and posted before scheduled lecture times: T & Th 2:30pm.

Virtual Review/Office Hours

Held by Webex via Webcampus on Th 2:30-3:45pm, or by request on F 4-5pm for 15min increments. If confidential matters need to be discussed private appointments can be arranged by email.

Required Materials

Textbook: Bacterial Pathogenesis: A Molecular Approach" 3rd edition, Wilson, Salyers, Whitt & Winkler. ASM Press.

Webcampus: Canvas access is required. It will be used to disseminate lecture materials, videos, assignments and be used for communication between students and the instructor.

Computer with a webcam and stable internet access: This device must be compatible with the Lockdown Browser and Respondus Monitor software. All exams will require Respondus software. **Note:** Chromebooks and iPads are not compatible. Students who do not have the requisite equipment may be

able to borrow a laptop from UNLV using the technology loaner program. Please reach out to Prof. Wing so that she can provide you with information about this program.

Respondus Lockdown Browser: Respondus Lockdown Browser can be downloaded and installed for free at this from https://www.it.unlv.edu/webcampus/respondus-tools

Webex: In Webcampus click on the webex navigation tool. When prompted to do so, download the webex plug-in, if you don't already have it. Information about how to use Webex and minimum requirements is described at https://drive.google.com/file/d/1KRrWrqKm8-6qxKSXE5tGYkZ0XLwulcV/view.How to join a Webex session in Canvas is described on https://drive.google.com/file/d/1DFgoZiOLlfhTJwkk5q3B5XlKvVWw0zn8/view

Supplementary Texts

- 1) Brock Biology of Microorganisms, any recent edition, Madigan, Martinko, Dunlap and Clark.
- 2) Todar's Online Textbook of Bacteriology is available at http://www.textbookofbacteriology.net/

Course Policies

Class Conduct: Students are encouraged to take notes from the posted lecture videos and ask questions in the WebCampus virtual review sessions on Thursdays (Webex meeting). The University requires that all students behave in ways that do not interfere with the right of other students to learn or instructors to teach. The instructor maintains a zero-tolerance policy on disruptive/inappropriate behaviors that compromise the learning environment. Consequences of such actions include administrative removal from the course. Students should be aware that they are not anonymous in this class and that inappropriate behavior will not be tolerated.

Recording Lectures

The content of lecture is the intellectual property of the instructor. The WebCampus-posted videos (Panopto and Webex) will be available throughout the semester, negating the need for individual students to create personal recordings. **Therefore, video and audio recording of these videos are** <u>not </u>**permitted.**

Communication: All communication is expected to be **professional and courteous**. Specific policies are detailed below:

- Email through WebCampus is the best method of communication with your instructor.
 Communication through non-UNLV platforms (e.g. any personal email address) is NOT allowed, and such messages will NOT be responded to.
- When emailing the instructor to set up a private appointment, please indicate the length of the
 requested meeting (e.g. 15 min, 30 min). One-on-one meetings will be held/arranged using
 the Webex appointment scheduler. If you cannot make the listed timeslots, email Dr. Wing 3
 or 4 times that would work for you. This strategy will allow a suitable timeslot to be identified
- All student communication with the instructor must occur directly. Unless there are mitigating circumstances, the instructor is not allowed to communicate with family members, or anyone else about matters related to individual students within this course.
- Questions about the course material are the only topics that will be addressed during review sessions and open office hours. Questions related to grades, absences, and any other personal matters will be addressed only during scheduled appointments.
- Messages will typically be addressed within 2 to 3 business days (M through F, 9AM through 5PM)
- Any student receiving unsolicited emails, discussion threads or announcements from other students should notify the instructor immediately.
- Use of the WebCampus email system to contact anybody other than the instructor is strictly PROHIBITED!

Grading

A, $100-\bar{9}0\%$; A-, 89-87%; B+, 86-83%; B, 82-80; B-, 79-77; C+, 76-73%; C, 72-70; C- 69-67%; D, 66-57%; and F, <57%.

Undergraduate Grading:

Midterm 1 28.3% Midterm 2 28.3% Final 33.3% Classroom Assignments 10% Extra Credit 1.5%

Graduate Grading:

Midterm 1 23.3% Midterm 2 23.3% Final 23.3% Essay 30% Extra Credit 1.5%

Exams and Assignments

Exams will cover material covered in lectures and in assigned readings. The format is still being determined but will likely be 40 multiple-choice, 10 true/false, and 3 short answer/essays (you pick 2). A portion of the final exam will likely test your comprehension of the entire course, so it can be described as a comprehensive exam. More information about exams will be given as the exams approach.

Given the use of Lockdown Browser and Respondus Monitor for examinations this semester, Dr Wing will arrange a mock exam to be taken at least one week prior to the first exam to ensure everything is working smoothly. This mock exam will **not** be on material presented in this course, but it will allow us all to familiarize ourselves with the system and resolve any problems before the first real examination.

Undergraduate Students will be able to obtain up to 5% of their final grade by completing assignments that will be made available through canvas (dates to follow). **Please note these are not extra credits** – these points are part of your final grade! Each assignment will be worth 1.667% of your final grade, even though the number of points in each assignment may vary.

Graduate Students will be given a list of essays titles, which cover a variety of aspects of bacterial pathogenesis. Students will be given essay titles in the first week of class. Students will be tasked with researching and writing a 5,000-word essay on their selected title. Essays should be a fully researched, up-to-date review of the chosen topic and must include citations of primary literature. Complete essays must be turned-in on the day of Lecture 20. Essays will be critiqued and returned to the student on the day of Lecture 24 before the final deadline that coincides with Lecture 27. Essays will be worth 30% of your final grade. Details about meetings to discuss essay topics, finalized timelines, and the how students should turn-in this assignment will be made available as the class begins.

Exam Policies

All students must comply with the following policies to provide a reasonable and unbiased testing environment. The examination period is 75 minutes for lecture exams and 120 minutes for the final exam.

- If any student requires a room on campus to be reserved for them to take their exams, they MUST contact the instructor in the first 2 weeks of the course (before Sept 3rd), otherwise they will need to find a room themselves.
- Exams will become available on Canvas 5 minutes before the scheduled time i.e. for midterms 2:25pm. The exam will be submitted 10 minutes after the scheduled time i.e. for midterms 3:55pm. This strategy provides students with an extra 15 minutes to enter via Lockdown Browser and complete all the necessary checks associated with Respondus Monitor. Although, exams can be entered while the exam is in progress, your time to completion will not be extended. The exam will end promptly at 3:55pm, so to ensure you have enough time to take the whole exam, be sure to enter the exam promptly at 2:25pm.

- Exam questions may be provided one at a time.
- A computer with a webcam (either built-in or external) and a stable/reliable internet connection is
 required. Students can repeatedly use the practice quiz entitled "Respondus LockDown Browser and
 Monitor Check" as a way to check the compatibility of their computer, webcam, and internet access.
- The exam will be taken on Respondus LockDown Browser® and Respondus Monitor®. Students are encouraged to sign in early to ensure everything is in working order.
 - o All other programs must be closed down for the LockDown Browser to function.
 - To access the exam within LockDown Browser, log into Canvas and find the exam within the Week Module. Once the exam is started, exiting LockDown Browser will not be possible until the exam has been submitted for grading.
 - Run the "Webcam Check" and the "System & Network Check" in LockDown Browser each time
 an exam is taken to ensure that there are not issues before starting the exam. Avoid adjusting the
 tilt of the webcam after the set-up process is complete.
 - During the ID check, a UNLV-, state-, or federal-issued photo ID must be provided (e.g. student ID, driver's license, passport). The ID must be held close enough to the camera so that the picture and name are visible/legible.
 - During the environment check, an entire 360° view of the surroundings must be shown. This includes the table/desk surface, the area to the left, right, and behind the computer, the floor, the ceiling, the lap, the arms/legs, and any other surface notes can be written on. This pan of the space must be done SLOWLY so that the video is not blurry. In the time between the environment check and the start of the exam, the student is NOT allowed to leave the room and must stay in view of the webcam.
 - Other than the computer being used to take the exam, no other electronic devices are allowed (e.g. no cell phones, no other computers, no tablets, no smart watches, no smart glasses, no electronic dictionaries/translators, no calculators, no headphones, no earbuds, no smart televisions). Such items must be turned off and secured outside of your exam room environment during the exam period.
 - Additionally, the use of any second computer screens during exams is strictly prohibited.
 - o Notes, textbooks, or other paper materials are NOT allowed in the exam environment.
 - If a student requires the use of one white sheet of letter paper. They must contact the instructor ahead of time and it must be shown to the camera during the Respondus Monitor Environment check.
 - The exam environment should be in a quiet location, free of interruptions, and cleared of all materials (see above) except for the computer the exam is being taken on. The computer should be placed on a desk/table. Do NOT put the computer on a bed, the lap, or any other surface that can easily move. The exam must be taken in a well-lit room so that the recording clearly shows the face. Avoid sitting in a place with backlighting. The student is NOT allowed to leave the room during the exam period.
 - The student must face the webcam, and the face must remain in clear view and fully in the frame throughout the exam. The top of the head to neck must be visible to the camera throughout the exam period. Hats, dark glasses, face coverings and anything else that obscures a student's face must be removed during the exam.
 - The student must dress appropriately since all recordings will be reviewed.
 - The student is not allowed to talk during the exam period, unless it is to call the instructor to report a technical issue with the exam.
 - Cell phones may ONLY be used during the exam to interact with the instructor in case of technical problems or emergency, or with OIT if first instructed by the instructor.
- Instructors will review all videos and any occurrences of academic misconduct (cheating or plagiarism) will result in a failing grade for the entire course.

- All course materials and electronic devices must be turned off and put away during all exams. If any
 course materials or electronic devices are out in the exam environment, academic dishonesty will be
 assumed, and the actions indicated in the University policies will be taken.
- The instructor and proctors will not answer questions or have discussions during the exam. If students are concerned about a particular question, they may submit a type-written statement to the instructor after the exam.
- Students must notify the instructor, during the exam period via a phone call placed to her office
 phone, if there is a technical issue with the exam. No compensation will be given if the instructor is
 notified after the exam has ended.

Help with Respondus LockDown Browser issues:

- LockDown Browser has a "Help Center" button located on the toolbar. Use the "Webcam Check" and
 "System & Network Check" to troubleshoot issues. The UNLV IT Help Desk
 (https://www.it.unlv.edu/it-help-desk) can help if needed. Alternatively, these tools may prove useful:
 (https://www.it.unlv.edu/webcampus/respondus-tools).
- Respondus has a Knowledge Base available at https://support.respondus.com/support/index.php?/Knowledgebase/List support.respondus.com.
 Select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product.
- If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it.

Grade Reporting

Exam grades will be reported to students using an Excel spreadsheet and the Last 4 of their L#. This is necessary because students will choose 2 out 3 essay questions to answer in each midterm. Gradebook cannot handle this choice component. The exam will say 80 points are available but students are only required to answer 70 points. This causes confusion – so let's just refer to the Excel spreadsheet I send for Exam scores. Raw scores on assignments will be reported in gradebook in Canvas. **The instructor will NOT use the Total Grade column in Gradebook** (please ignore these columns). If you are concerned that a mathematical error has been made in calculating your exam grade, please bring it to the attention of the instructor immediately. The instructor will provide students with an opportunity to review exam responses (details to follow). The instructor reserves the right to curve grades as appropriate.

Exam Absences

There are **NO MAKE-UP EXAMS**, unless the University policies regarding religious holidays, official extracurricular activities and military service are applicable. Students missing an exam due to a religious holiday, official extracurricular activity and military service must notify the instructor of their intent in writing during the first 14-days of the semester. The notification date for students covered under these policies is **Monday September 6, 2021**. Eligible students will take a make-up exam. A make-up exam may not be similar to the original and it must be completed within 2 weeks of the original exam. A student who does not take a make-up exam within 2 weeks of the original exam will receive a zero for the test. **Verbal notification of an absence is not acceptable**. Official documentation must be provided with the form for extracurricular activities (e.g. military orders, letter from coach). If the absence is due to a personal issue, please contact Dr. Wing within 3 class days of the missed exam and provide a thorough explanation of the situation. All make-up exams will be essay format. **Unexcused absence from an exam will result in a score of zero**.

Additional Best Practices for this Class

This is a challenging upper division class. Before taking the class, you are expected to have a firm understanding of fundamental microbiology, molecular biology & genetics. If you believe that you do not have the appropriate background or find early in the course that you are unable to maintain the pace required, consider dropping the class. If you find yourself struggling, further into the class, immediately make an appointment with Dr. Wing so that she can help.

All course materials (e.g. lectures, exams, handouts) are the intellectual property of Dr. Wing. These course materials are for the PERSONAL use of students enrolled in the class. Distribution of these materials through any means is strictly prohibited!

Prof. Wing reserves the right to modify course policies and content, including grading.

UNLV Policies:

Academic Misconduct

Academic integrity is a legitimate concern for every member of the University community. We all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without proper citation of the source(s). See the Student Conduct Code, https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf

Auditing a Course

Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

Classroom Conduct

Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn, or of instructors to teach. Use of devices such as cellular phones and pagers, or other potentially disruptive activities are only permitted with the prior explicit consent of the instructor. Students are specifically prohibited to record classes without instructor authorization, including online/remote classes (either audio only, or video and audio). The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative withdrawal of the student from the course.

Since the COVID-19 pandemic forced some instruction to be delivered remotely starting in Spring 2020, numerous students have asked instructors to record their synchronous classes, so that they can access them at their convenience. Instructors who agree to record their classes (audio only, or video and audio) should inform students in advance. Recorded lectures may not be broadly released to anyone but made available exclusively to those students enrolled in the class during the particular academic term. Recorded lectures must be stored securely and are subject to the Nevada System of Higher Education's Records Retention Policy, meaning that the recordings can only be deleted 120 days after the end of class (i.e., after grades are posted). Once this requirement is met, the recordings should be deleted. Class recordings are protected from disclosure, as they are deemed part of an educational record under the Family Educational Rights and Privacy Act (FERPA).

Copyright

The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you, nor assume any

responsibility for student or employee violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional copyright policy information is available at https://www.unlv.edu/provost/copyright

Final Examinations

The University requires that final exams given at the end of a course occur on the date and at the time specified in the Final Exam schedule. The Final Exam schedule is typically available at the start of the semester, and the classroom locations are available approximately one month before the end of the semester. See the Final Exam Schedule, https://www.unlv.edu/registrar/calendars.

Identity Verification in Online Courses

All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus-Canvas.

UNLV students enrolled in online or hybrid courses are expected to read and adhere to the Student Academic Misconduct Policy, https://www.unlv.edu/studentconduct/misconduct/policy, which states that "acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment" is a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute, and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy.

UNLV students enrolled in online courses are also expected to read and adhere to the Acceptable Use of Computing and Information Technology Resources Policy, https://www.it.unlv.edu/policies/acceptable-use-computing-and-information-technology-resources-policy, which prohibits sharing university accounts with other persons without authorization.

To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus-Canvas or another UNLV-managed platform that requires ACE login credentials for access.

Incomplete Grades

The grade of "I" (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session, but cannot complete the last part of the course for reason(s) beyond the student's control and acceptable to the instructor, and the instructor believes that the student can finish the course without repeating it. For undergraduate courses, the incomplete work must be made up before the end of the following regular semester. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of "F" will be recorded, and the student's GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the "I" grade.

Missed Classwork

Any student missing class, quizzes, examinations, or any other class or laboratory work because of observance of religious holidays will be given an opportunity during that semester to make up the missed work. The make-up opportunity will apply to the religious holiday absence only. It is the responsibility of the student to notify the instructor within the first 14 calendar days of the course for Fall and Spring courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Missed Classwork policy, under Registration Policies, on the Academic Policies webpage,

https://catalog.unlv.edu/content.php?catoid=32&navoid=8271&hl=.

In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student submits official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. Instructors should consider, for example, that in courses which offer a "Drop one" option for the lowest assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate's policy, and an infringement on the student's right to complete all work for the course.

This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could be reasonably avoided. There should be a good faith effort by both the instructor and the student to agree to a reasonable resolution. When disagreements regarding this policy arise, decisions can be appealed to the Department Chair/School Director, College/School Dean, and/or the Faculty Senate Academic Standards Committee.

For purposes of definition, extracurricular activities may include, but are not limited to academic recruitment activities, competitive intercollegiate athletics, fine arts activities, liberal arts competitions, science and engineering competitions, and any other event or activity sanctioned by a College/School Dean, and/or by the Executive Vice President and Provost.

Public Health Directives

Face coverings are mandatory for all faculty and students in the classroom. Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at Health Requirements for Returning to Campus, https://www.unlv.edu/coronavirus/health-requirements. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the UNLV Student Conduct Code, https://www.unlv.edu/sites/default/files/page_files/27/StudentConduct-Code.pdf, including being administratively withdrawn from the course.

Rebelmail

Rebelmail is UNLV's official email system for students and by University policy, instructors and staff should only send emails to students' Rebelmail accounts. Rebelmail is one of the primary ways in which students receive official University communications, information about deadlines, major Campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the University. Sending emails within WebCampus-Canvas is also acceptable.

UNLV Resources

Disability Resource Center (DRC)

The UNLV Disability Resource Center (Student Services Complex, SSC-A, Room 143, https://www.unlv.edu/drc, telephone 702-895-0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to a permanent disability, temporary or permanent medical need, or academic support due to pregnancy are encouraged to contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. Students who are already registered with the DRC should request their accommodations online each semester and make an appointment to discuss their accommodations with their instructors.

Library Resources

Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the Libraries' Research Consultation website,

https://guides.library.unlv.edu/appointments/librarian. You can also ask the library staff questions via chat and text message at https://ask.library.unlv.edu/.

Tutoring and Coaching

The Academic Success Center (ASC), at the Claude I. Howard Building, provides tutoring, academic success coaching, and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, please visit the ASC website, https://www.unlv.edu/asc, or call 702-895-3177. The ASC is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of SSC A,

Room 254. Drop-in tutoring is located on the second floor of the Lied Library, and on the second floor of the College of Engineering building (TBE A 207).

UNLV Writing Center

One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, https://writingcenter.unlv.edu/, located in the Central Desert Complex, Building 3, Room 301 (CDC 3–301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, telephone 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.

Diversity Statement

As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see University Statements and Compliance, https://www.unlv.edu/about/statements-compliance.

A successful learning experience requires mutual respect and trust between the students and the instructor. Accordingly, the instructor asks that students be willing to listen to one another's points of view, acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.