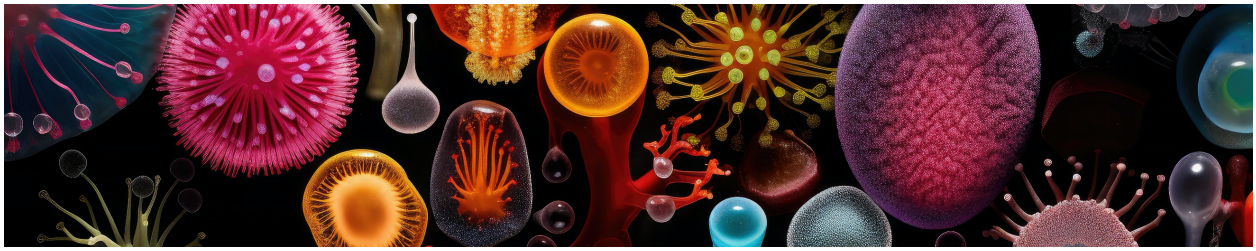

MCB5252 Microbiology, Immunology, and Basis for Immunotherapeutics

Spring, 2026
Online Asynchronous, 4-Credits

Instructors:

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I genuinely care about your success in this course. Please reach out to me via email, phone calls, text messages. Your well-being during the semester is paramount to everything else. Please take care of your health while going through these stressful times in your professional life. Let me know if I can be of any assistance to you. I wish you all the best with your academic and professional endeavors.

Student Learning Objectives

- This course provides an understanding of microbial structure and function with regards to their role in pathogenesis and infection. Principles of pathogenesis and infection will be discussed in depth. The course explores the mechanism of pathogenicity, modes of transmission, and explores ways microbes evade host defense system.
- Explore and Discuss Public Health Microbiology, Epidemiology, Nosocomial Infections, Emerging Infectious Diseases, and discuss the role of different governmental agencies in monitoring infectious diseases.
- Microbial Fundamentals: This course explores impact of various virulence factors possessed by microbes in pathogenicity and their role in establishing infection. You will be able to summarize the classification, taxonomy, structure, staining techniques, bio metabolism, and genetics of microorganisms, providing a strong foundation for understanding their roles in health and disease.
- Bacterial Interactions and Clinical Implications: You will be able to explain the virulence factors of bacteria, their clinical manifestations, and significance in human health, as well as correlate bacterial metabolism and physiological characteristics with host interactions to enhance diagnostic and susceptibility testing.
- Research and Practical Applications: You will be equipped to relate clinical microbiology research findings to current and future practices, enabling you to integrate laboratory results with clinical observations and contribute to improved patient care.

- The role of immune system in defending the host against infection, and what happens when it breaks down will be examined. The course covers General therapeutic principles and mechanisms of bacterial resistance to anti-microbial drugs. The discussion regarding anti-microbial agents includes class and mode of action of anti-microbial agents. We explore the relationship between structure and function and its role in rise of antibiotic-resistant strains. A discussion regarding immunotherapy and the use of Immunotherapeutic drugs for treating cancer and other human diseases is also included.

At the end of the term students should have a good understanding of the infectious diseases, their causative agents, the immune response to infectious diseases, available treatments, and the preventive measures against them. Students will also have an in-depth understanding of Microbiological and serological techniques and their role in identification of infectious diseases.

Outline of topics discussed in this course

- Explore host-Parasite Interactions and microbes as agents of infectious diseases
- Explore prokaryotic cell structure, genetic and metabolism and their impact on microbial pathogenicity
- Understanding mechanism of pathogenicity, and role of various virulence factors and their contribution to the disease process
- Exploring public health microbiology and epidemiology
- Discussing the impact of healthcare-associated infections (nosocomial infections)
- Exploring major groups of microbial pathogens-survey of various infectious agents
- Summarize bacterial classification, taxonomy, structure, staining techniques, bio metabolism, and genetics of microorganisms, providing a strong foundation for understanding their roles in health and disease.
- Bacterial Interactions and Clinical Implications: You will be able to explain the virulence factors of bacteria, their clinical manifestations, and significance in human health, as well as correlate bacterial metabolism and physiological characteristics with host interactions to enhance diagnostic and susceptibility testing.
- Research and Practical Applications: Explore clinical microbiology research findings in current and future practices, enabling you to integrate laboratory results with clinical observations and contribute to improved patient care.
- Understanding Immune Defense Mechanism; Innate vs. Acquired Immunity (AMI and CMI)
- Exploring immune system components, systems, organs, cells, proteins, and other mediators
- Understanding Hypersensitivity, Autoimmunity, Immune Deficiency/Disorder, and Allergy
- Understanding role of vaccine in preventing infectious disease and exploring types of vaccine
- Exploring major viral infections and role of viruses in causing cancer
- Exploring Immunotherapeutics, Antimicrobial Drugs, Antibiotics, antiviral drugs, and Mechanism of Antibiotic Resistance
- Understanding the role of infectious agents in causing cancer
- Exploring Immuno-Oncology, Use of Immunotherapeutic Drugs in Cancer Treatment-Class of monoclonal antibody (Mab) drugs, Cytotoxic T-cells
- Clinical and Diagnostic Microbiology, Serology, and Immunological Testing-Identification of Infectious Diseases

Course Description & General Education Purpose

Explore microbes as agents of infectious diseases. Study infectious diseases and mechanism of pathogenicity. Explore host defense mechanism and its role in encountering infectious diseases. Immunology discussion also includes Immunodeficiency, Hypersensitivity (allergy), Autoimmunity, and Vaccine development. Exploring antimicrobial drugs, immunotherapy, and their mechanism of action. Study of antimicrobial drugs also include developing antibiotic resistance. A brief discussion of immune oncology is also included

Canvas Course Website:

The class is on E-learning (Canvas). The class syllabus, lecture presentations, study guides, and other materials will be posted on E-Learning throughout the semester. Details and clarifications about class policy will be posted online as announcements or emails on a regular basis. Students should check their emails and announcements on Canvas daily. Students should use Canvas email for email correspondences. The recommended e-textbook serves as a reference and provides supplemental materials that help with understanding materials presented in lectures, lecture notes, quizzes, and other assignments

Student & Instructor Expectations

I am committed to (1) providing a welcoming atmosphere; (2) teaching you something new and unexpected within the course topics; and (3) introducing you to relevant topics & ideas. I am available during Zoom office hours which are posted within Canvas.

For this course to run smoothly, I expect students to:

- **Have** a computer, and stable internet connection (see the section below on "Online Submissions").
- **Check Canvas** for announcements at least twice a week.
- Participate in class with **honesty**.
- **Be responsible for keeping up with due dates**. Use Canvas to identify all due dates. All deadlines are set for 11:59 pm ET. Late work is not accepted. Extra time has been built into all deadlines and due dates.
- **Submit work early**, if necessary. If you work or have extracurricular commitments that impact your ability to meet a course deadline, you need to submit quizzes, and exams before the due date.
- **Late Work and Makeup Policy**. Due dates are strictly enforced. Assignments remain open for several days. No makeup or late work is accepted except for medical excuses granted prior to the assignment deadline.
- **Student-Instructor Communication Tool**. If you think a question has been graded unfairly or if you missed a quiz or assignment deadline, use Canvas messaging.

Online Submissions

Students are responsible for verifying assignments are successfully submitted into Canvas. The instructor cannot be responsible for internet connections or failures. Locating a hard-wired connection (UF or public library) greatly reduces the instance of technical issues. Contact the instructor early if you foresee difficulty with maintaining a hard-wired connection (e.g., military service or living abroad). UF

Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Course Prerequisites

Statement: Students are encouraged to be self-directed and take responsibility for their learning.

Materials and Supplies & Fees

Review of Medical Microbiology and Immunology, A guide to Clinical Infectious Diseases by Warren Levinson et al 18th edition (**2024, highly recommended**). The textbook serves as a reference and helps with understanding materials presented in lectures, lecture notes, quizzes, and other assignments

Course Topic Schedule

Week/Module	Topics	Assessments/Activities	Submission Window
Module 1 01/12 - 01/18	Bacterial Cellular Structure and Function Microbes as Agents of Infectious Diseases, Host-parasite interactions, Mechanism of pathogenicity,	Orientation Quiz, Honorlock Practice Test Module 1 Lectures	01/12 - 01/18
Module 2 01/19 - 01/25	Major Groups of Bacterial Pathogens, Virulence factors, Bacterial Pneumonia and Bacterial Meningitis	Quiz ONE, Module 2 Lectures	01/19 - 01/25
Module 3 01/26 - 02/01	Public Health Microbiology, Epidemiology, Nosocomial Infections, Emerging Pathogens	Quiz TWO, Module 3 Lectures	01/26 - 02/01
Module 4 02/02-02/08	**Exam ONE Modules 1-3 Lectures Exam ONE Required Readings 1-2**	**Exam ONE Modules 1-3 Lectures Exam ONE Required Readings 1-2**	**02/06-02/08**
Module 5 02/09 - 02/15	Staphylococci and Streptococci Infections, Bacillus and Clostridium Infections	Quiz THREE Module 5 Lectures	02/09 - 02/15
Module 6 02/16 - 02/22	Enterobacteriaceae	Quiz FOUR Module 6 Lectures	02/16 - 02/22
Module 7 02/23 - 03/01	Neisseria and Chlamydia, and other bacterial sexually transmitted Infections	Module 7 Lectures	02/23 - 03/01
Module 8 03/02-03/08	**Exam TWO Modules 5-7 Lectures Exam TWO Required Readings 1-2**	**Exam TWO Modules 5-7 Lectures, Exam TWO Required Readings 1-2**	**03/06-03/08**
Module 9, 10 03/09 - 03/22	Immune system components: organs, cells, proteins, and other mediators Innate, antibody-mediated (AMI), and cell-mediated (CMI) immunity	Quiz FIVE Modules 9, 10 Lectures	03/09 - 03/22
Spring Break 03/16 - 03/22	**Stay healthy, Be Safe, and Have Fun**	**Plenty Rest, Eat Healthy, Stay Active**	**03/16-03/22**
Module 11 03/23 - 03/29	Immune response to infectious diseases, Immune Disorders; hypersensitivity, immunodeficiency, and vaccines	Quiz SIX Exam 3 Required Reading P.2 Module 11 Lectures	03/23 - 03/29
Module 12 03/30-04/05	**Exam THREE Module 9-11 Lectures**	**Exam THREE Module 9-11 Lectures**	**04/03-04/05**

	Exam THREE Required Readings 1-2	**Exam THREE Required Readings 1-2**	
Module 13 04/06 - 04/12	Virology, mechanism of viral pathogenicity, survey of infectious diseases caused by viruses, fungi, and protozoa	Quiz SEVEN Module 13 Lectures	04/06 - 04/12
Module 14 04/13-04/19	Antimicrobial drugs, antibiotics, antivirus, antifungal and antiparasitic drugs, MAbs, Immunotherapeutics	Quiz EIGHT Module 14 Lectures	04/13-04/19
Module 15 04/20-04/26	**Clinical Case Study**	**Clinical Case Study** **Due 04/20-04/26**	04/20-04/26
Module 16 **04/27 - 04/29**	**Exam FOUR** **Modules 14-15 Lectures** **Exam FOUR Required Readings 1-2**	**Exam FOUR** **Modules 14-15 Lectures** **Exam FOUR Required Readings 1-2**	**04/27-04/29**

Exams cover materials presented in module Lectures and required readings.

Grading Policy

Four scheduled exams are given through Canvas via Honorlock. Exams are conducted via Honorlock. Homework and quizzes will be required through Canvas.

Assignment Type	Points of Final Grade
Exams (4)	60%
Clinical Case Study (1)	20%
Canvas Quizzes (8)	20%
Total	100%

Grading Scale

Grading scale (Total Percentage %):

A	90% and Up
A-	88% – 89.99%
B+	86% – 87.99%
B	80% – 85.99%
B-	78% – 79.99%
C+	76% – 77.99%
C	68% – 75.99%
C-	66% – 67.99%
D	55% – 65.99%
E	Below 55%

Due Dates & Late Policy

Please be proactive and work ahead to avoid late submissions. All assignments are due at 11:59pm ET on the last day of the submission window. Due dates are strictly enforced. Assignments remain open for several days. No makeup or late work is accepted except for medical excuses granted prior to the assignment deadline. Requirements for make-up exams, and other work in this course are consistent with university policies. UF Attendance Policies

Academic Honesty

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.

Student Privacy Disclaimer:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

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 guest 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

Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. 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 the GatorEvals site. Summaries of course evaluation results are available to students at GatorEvals Public Data.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Services for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodation should contact the disability Resource Center. Click here to get started with the Disability Resource Center. 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.

Campus Resources

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

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 https://umatter.ufl.edu/ to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: Visit https://counseling.ufl.edu/ 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 https://shcc.ufl.edu/
- *University Police Department*: Visit https://police.ufl.edu/ 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 https://ufhealth.org/locations/uf-health-shands-emergency-room-trauma-center
- *GatorWell Health Promotion Services*: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit https://gatorwell.ufsa.ufl.edu/ or call 352-273-4450.

Academic Resources

- *E-learning technical support*: Contact the UF Computing Help Desk at 352-392-4357 https://helpdesk.ufl.edu/ 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*: 1317 Turlington Hall, 352-392-2010. General study skills and tutoring.
- *Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Concern*: Report Student Concerns or Conduct

Additional Information

To understand biology, you must think three dimensional. One way to understand and comprehend biological concepts is to see these “Big Picture”. Understand the general concepts makes it easier to the details.

Privacy and Accessibility Policies

For information about the privacy policies of the tools used in this course, see the links below:

- Honorlock
  - Honorlock Privacy Policy
  - Honorlock Accessibility
- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Microsoft
  - Microsoft Privacy Policy
  - Microsoft Accessibility
- Sonic Foundry (Mediasite Streaming Video Player)
  - Sonic Foundry Privacy Policy
  - Sonic Foundry Accessibility (PDF)
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility