MCB5205: Bacterial Pathogens

Fall 2025
Online Asynchronous
3 credit hours

Instructor

Mariola J. (Edelmann) Ferraro

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  - My preferred method for communication is Canvas message or e-mail. Zoom, phone, or in-person conferences are by appointment only (please use e-mail to schedule).
- Office hours: Monday 10-11 AM

Teaching Assistant

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  - My preferred method of communication is e-mail. Zoom, phone, or in-person conferences are by appointment only (please use e-mail to schedule).
- Office hours: Thursday 4-5:30 p.m

Course Description

This course is designed to introduce you to the field of host-microbe relationships in the diseases of humans and animals. The overall goal of this class is to enhance students' learning in the field of microbiology, related to the various pathogenic mechanisms used by bacteria. This class will cover topics such as host-pathogen relationships, pathogenic mechanisms used by bacteria, antibiotic resistance, vaccines, and the function of the microbiome in disease. Students will participate in discussion boards and case studies to apply their knowledge in real-life scenarios.

Course Learning Objectives

By the end of this course, students will be able to:

- Analyze the intricate interplay between the host immune system and bacterial pathogens to develop a comprehensive understanding of microbial virulence.
- Investigate the strategies and mechanisms employed by bacterial pathogens to induce disease, by studying various examples and case studies.
- Apply analytical skills to critically examine real-world scenarios of infectious diseases, thereby enhancing your ability to navigate the complexities of this field.
- Evaluate the laboratory techniques, diagnostic methodologies, and research strategies used to assess the virulence and disease-causing potential of bacterial pathogens.
- Examine strategies for the prevention and treatment of host infections and associated diseases, with a particular focus on vaccines, antibiotics, and the role of microbiota.
- Critically assess the development and implementation of interventions that effectively combat infections, considering the factors influencing their success and limitations.

Course Prerequisites

Students should have completed MCB3020 or MCB3023 with a grade of C or higher.

Textbooks, Learning Materials, and Supply Fees

Wilson, et al. Principles of Bacterial Pathogenesis, A Molecular Approach (4th Edition), ISBN-10: 1555819400, ISBN-13: 978-1555819408 (optional). Assigned peer-reviewed readings are included with assignments. Please see the individual Canvas modules for more details.

Instructor Interaction Plan

Canvas messages or UF email are the preferred ways to reach me. I respond to messages within 24–48 hours during the work week (Monday–Friday). Zoom, phone, or in-person meetings are available upon request; please email to schedule. Office hours are offered weekly unless specified otherwise.

Attendance policy

As this is a fully online, asynchronous course, you are expected to exhibit a high level of self-discipline. Each module was designed for completion on a week-by-week basis (with a few exceptions of assignments being worked on over multiple modules). During Week 1, I recommend you peruse each module in Canvas to familiarize yourself with deliverables, number of lectures, and readings.

If you have a particular way you like to organize your workload, I encourage you to set up these systems in Week 1 so you can keep track of your work. Each module includes assigned readings, videos, supplemental materials, and assignments. Please complete all modules within their respective weeks and by their listed deadlines. You are expected to complete all assignments by their stated due date. Additionally, I expect you to complete the readings in advance of watching the lectures.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university attendance policies.

Minimal technology requirements

The University of Florida expects students entering an online program to acquire computer hardware and software appropriate to their degree program. A student's computer configuration should include webcam, microphone, broadband access, and Microsoft Office Suite.

Individual colleges may have additional requirements or recommendations, which students should review before starting their program.

More information on technical requirements is available at the UF Online website.

To complete your tasks in this course, you will need a basic understanding of operating a computer and using word processing software.

Technical Support

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 assessments

Quizzes

The orientation quiz does not count towards your final average, but it must be completed at a score of 100% before the rest of the course will open. The orientation quiz may be taken multiple times, until the desired score is achieved.

There are also graded PlayPosit quizzes embedded in the module lectures. These quizzes are meant to help you review the course material and practice for the exams. All PlayPosit quizzes may be taken multiple times.

Discussion Boards

These discussions will allow you to engage in online discussions with your peers, sharing insights and perspectives on specific videos. Peer-engagement software called Perusall will be used for this assignment, where you post comments and insights about the videos and reply to your peers' annotations.

Case Studies

There will be several case study analyses that accompany selected peer-reviewed article readings. These case studies will provide you with an opportunity to apply your knowledge and critical thinking skills to real-world scenarios. The assignments will also use Perusall, giving you further opportunities to interact with your peers.

Exams

You will have three graded exams during the semester. Canvas includes three ungraded practice exams to help you prepare for the graded exams. All your graded exams are online in Canvas and proctored by Honorlock. Note that in-person examinations are not an option for this 100% online course. It is your responsibility to get familiar with the Honorlock proctoring service. Honorlock instructions and requirements are available in the Orientation module in Canvas.

Pathogen Project

You will select a historic, emerging, or re-emerging bacterial pathogen of interest and research it. Then, you will prepare a written summary which discusses the history of the pathogen, its pathogenesis, host counter measures, treatment strategies, preventative strategies, and new, exciting aspects of studying the pathogen. Additionally, you will highlight unanswered questions that could aid in the design of treatments.

The paper will be 7-9 pages in length and include at least 10 appropriate references (peer-reviewed scientific journals). Turnitin will be employed to check for plagiarism or inappropriate use of sources. For more assignment details, please see the assignment page in Canvas.

You are encouraged to use Endnote Web, a free-of-charge resource provided by UF, or other library management software to assist with organizing your references.

Weekly Course Schedule

Week	Starts	Module and Textbook Chapters	Assignments Due
1 & 2	8/21	Module 0: OrientationModule 1: Course Introduction — *Wilson*, Ch. 1	Course Orientation Quiz Perusall Introduction Introductory Discussion PlayPosit Quizzes (2)
3	9/1	Module 2: Physical Defenses and Innate Immunity — *Wilson*, Ch. 2 & 3	PlayPosit Quizzes (4)
4	9/8	Module 3: Adaptive Immunity — *Wilson*, Ch. 4	PlayPosit Quizzes (3)
5	9/15	Module 4: Vaccination — *Wilson*, Ch. 17	PlayPosit Quizzes (2) Discussion 1
6	9/22	Module 5: Microbiota of the Human Body — *Wilson*, Ch. 5	PlayPosit Quizzes (3) Case Study 1 Exam 1 *(Modules 1–4)*
7	9/29	Module 6: Microbes and Disease — *Wilson*, Ch. 6	PlayPosit Quizzes (3)
8	10/6	Module 7: Measuring Infectivity and Virulence — *Wilson*, Ch. 8	PlayPosit Quizzes (3)
9	10/13	Module 8: Identification of Virulence Factors — *Wilson*, Ch. 9 & 10	PlayPosit Quizzes (3) Case Study 2
10	10/20	Module 9: Bacterial Invasion of Host Defenses — *Wilson*, Ch. 11	PlayPosit Quizzes (4)
11	10/27	Module 10: Bacterial Toxins — *Wilson*, Ch. 12	PlayPosit Quizzes (2) Exam 2 *(Modules 5–9)*
12	11/3	Module 11: Delivery of Virulence Factors and Regulation — *Wilson*, Ch. 13 & 14	PlayPosit Quizzes (4)
13	11/10	Module 12: Antimicrobial Therapeutics and Resistance — *Wilson*, Ch. 15 & 16	PlayPosit Quizzes (3) Discussion 2
14 & 15	11/17	Module 13: Gram-Positive Opportunistic Pathogens — *Wilson*, Ch. 18	PlayPosit Quizzes (2) Case Study 3 Extra Credit Assignment

16	12/2	Module 14: Gram-Negative Opportunistic Pathogens, Biosecurity — *Wilson*, Ch. 19 & 20	PlayPosit Quizzes (2) Pathogen Project
17	12/6	Finals	Exam 3 *(Modules 10–14)*

Grading Policy

Course grading is consistent with UF grading policies.

Course Grading Structure

Assignment	Points
PlayPosit Quizzes (40)	120 points
Discussion Boards (2)	100 points
Case Studies (3)	120 points
Exams (3)	660 points
Pathogen Project	120 points
Total:	**1120 points**

Grading Scale

A	100.0-94.0%	C+	79.0-77.0%
A-	93.0-90.0%	C	76.0-74.0%
B+	89.0-87.0%	C-	73.0-70.0%
B	86.0-84.0%	D+	69.0-67.0%
B-	83.0-80.0%	D	66.0-64.0%
D-	63.0-61.0%	F	60.0% and below

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact UMatterWeCare for additional and immediate support.

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.

Privacy and Accessibility Policies

- Adobe
  - Adobe Privacy Policy
  - Adobe Accessibility
- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Microsoft
  - Microsoft Privacy Policy
  - Microsoft Accessibility
- PlayPosit
  - PlayPosit Privacy Policy
  - PlayPosit Accessibility
- Perusall
  - Perusall Privacy Policy
  - Perusall Accessibility
- Sonic Foundry (Mediasite Streaming Video Player)
  - Sonic Foundry Privacy Policy
  - Sonic Foundry Accessibility (PDF)
- YouTube (Google)
  - YouTube (Google) Privacy Policy
  - YouTube (Google) Accessibility

- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility

Disclaimer

Information contained in this syllabus is, to the best knowledge of this instructor, considered correct and complete when distributed to students. The instructor reserves the right, acting within the policies and procedures of the University of Florida, to make necessary changes in course content or instructional techniques with notification to students.