

University of Montana

## ScholarWorks at University of Montana

---

University of Montana Course Syllabi, 2021-2025

---

Fall 9-1-2022

### PUBH 615.50: Infectious Disease Epidemiology and Control

Sophia Raff Newcomer

*University of Montana, Missoula*, [sophia.newcomer@umontana.edu](mailto:sophia.newcomer@umontana.edu)

Erin Landguth

*University of Montana, Missoula*, [erin.landguth@umontana.edu](mailto:erin.landguth@umontana.edu)

Follow this and additional works at: <https://scholarworks.umt.edu/syllabi2021-2025>

**Let us know how access to this document benefits you.**

---

#### Recommended Citation

Newcomer, Sophia Raff and Landguth, Erin, "PUBH 615.50: Infectious Disease Epidemiology and Control" (2022). *University of Montana Course Syllabi, 2021-2025*. 229.

<https://scholarworks.umt.edu/syllabi2021-2025/229>

This Syllabus is brought to you for free and open access by ScholarWorks at University of Montana. It has been accepted for inclusion in University of Montana Course Syllabi, 2021-2025 by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact [scholarworks@mso.umt.edu](mailto:scholarworks@mso.umt.edu).

# **PUBH 615: Infectious Disease Epidemiology and Control**

Fall 2022

Online

Moodle / Zoom

Instructor(s): Sophia Newcomer, PhD, MPH  
[Sophia.newcomer@umontana.edu](mailto:Sophia.newcomer@umontana.edu)

Erin Landguth, PhD, MS  
[Erin.landguth@mso.umt.edu](mailto:Erin.landguth@mso.umt.edu)

Office Hours Available in person or via Zoom by appointment

## **COURSE SYLLABUS**

---

### **Course Description**

This graduate-level course will review infectious disease concepts, examine principles of epidemiology used to characterize infectious diseases, and explore how these concepts and principles are applied to control infectious diseases. Special topics in infectious disease including COVID-19, disease transmission modeling and geospatial epidemiology will be explored. Vaccines as a means to prevent infectious diseases will be covered in detail, including vaccine safety monitoring and vaccine hesitancy in the United States.

### **Prerequisites**

There are no prerequisites for this course.

### **Course Objectives**

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

- Discuss influential events and individuals in infectious disease history

- Define key concepts in infectious disease epidemiology
- Describe the dynamics and different routes of infectious disease transmission
- Explain the significance of the basic reproductive number and reproductive number in infectious disease transmission
- Assess the strengths and weaknesses of different study designs used in investigations of infectious diseases
- Outline individual and community-based efforts to prevent infectious disease transmission
- Explain the importance of vaccines and the goals of immunization programs
- Outline the steps of an outbreak investigation
- Describe the basic roles of humans' immune responses to infectious diseases
- Assess the public health importance of a range of viral, bacterial, and other types of infectious diseases

## Competencies & Assessment Activities

MPH Program competencies	Assessment activities
Apply epidemiological methods to the breadth of settings and situations in public health practice.	Assignment 2, Discussion Forum 3, Assignment 3, Assignment 4
Select quantitative and qualitative data collection methods appropriate for a given public health context.	Discussion Forum 1, Discussion Forum 2
Interpret results of data analysis for public health research, policy and practice	Outbreak Case Study
Evaluate policies for their impact on public health and health equity	Assignment 1, Assignment 5
Communicate audience-appropriate public health content, both in writing and through oral presentation	Discussion Forum 4, Discussion Forum 5
Public Health PhD competencies	Assessment activities
Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population.	Midterm, Final, Outbreak Case Study

Explain the critical importance of evidence in advancing public health knowledge.	Midterm, Final, Outbreak Case Study
<b>Public Health PhD content coverage</b>	<b>Assessment activities</b>
Explain public health history, philosophy and values	Assignment 1, Assignment 5

## Required Textbook / Readings

1. Adams. Foundations of Infectious Disease: A Public Health Perspective. Jones & Bartlett Learning, 1st edition, 2020.
2. Additional readings will be posted in Moodle.

The Adams textbook is required for the course. You can either order a Paperback + eBook option or just the eBook format from the Jones & Bartlett Learning website.

## Course Format

This course will be delivered in an online format using Moodle. As noted in the weekly schedule below, the typical course 'week' begins on a Monday and ends on Sunday. Assignments and Discussion Forum postings are typically due by the Wednesday following a course week. However, there are exceptions -- please refer to the Course Schedule at the end of this syllabus for all deadlines.

There will be one Moodle page for each course week. On each week's page, the week's learning activities will be described within the four categories of (1) Watch/Listen, (2) Readings, (3) Assignment, (4) Discussion Forum:

Watch/Listen - Live webinars, videos or podcasts to watch or listen to support the week's learning material.

Readings - Required readings from the Adams textbook and other readings that will be posted.

Assignment - Assignments are used to assess competency with the week's topics. Assignments will be completed individually and submitted via Moodle. Students are welcome to collaborate with other students on assignments, but each student must submit their own work. Week 6's assignment is an Outbreak Case Study which is graded differently than the other class assignments (see Grading section below).

Discussion Forum - Along with assignments, discussion forums will also be used to assess competency with the week's topics. Discussion Forums will take place online using the Discussion Board feature on that week's Moodle page. Typically, participation in the Discussion Forum will involve each student making their own posting, and then responding to two other students' postings. Complete instructions for each discussion forum will be posted on the week's Moodle page. Discussion Forum participation is graded (see Grading section below).

Some weeks may not include activities from all categories. Please refer to the course schedule and each week's Moodle page for learning activity expectations.

**Please refer to the course schedule below for all due dates for Assignments and Discussion Forums.**

UMOnline has made available an interactive tutorial for using Moodle as a student. The tutorial and other resources can be found at the following web site: <http://umonline.umt.edu/>

## Communication

Communication will take place using general announcements, e-mail, and discussion boards. E-mail should be used for “private” communication with the instructor or other students. Any questions regarding grades or communication about more personal issues should be handled via email. Please include “PUBH 615” in the subject line for e-mail communication with the instructor, and direct your email to the instructor of record for the week (listed below on the Weekly Schedule).

Discussion boards are appropriate for questions or discussions that would normally occur in the classroom. Remember that the discussion board is public and your classmates can read what you post there.

## Grades

This course will use the traditional letter grades with the use of pluses or minuses. Students can view their grades online by clicking Course Tools and then selecting Gradebook. Weights will be assigned to course components as follows:

1. Assignments, 25%
2. Online Discussion Forums, 25%
3. Outbreak Case Study, 10%
4. Midterm Exam, 20%
5. Final Exam, 20%

Grades will be calculated based on the percentage of total points available using the formula:

93 to 100 percent = A; 90 to 92 percent = A-minus; 87 to 89 percent = B-plus; 83 to 86 percent = B; 80 to 82 percent = B-minus; 77 to 79 percent = C-plus; 73 to 76 percent = C; 70 to 72 percent = C-minus; 67 to 69 percent = D-plus; 63 to 66 percent = D; 60 to 62 percent = D-minus; below 60 percent = F.

Late assignment, discussion forums, or outbreak case study submissions will be graded zero unless there are serious and verifiable extenuating circumstances. Students who wish to request permission to submit an assignment or take an exam late must contact Drs. Newcomer and Landguth well before the deadline.

## Assignments & Assessments

### Assignments

Throughout the semester, students will complete assignments designed to provide an opportunity to synthesize learnings from the week or to practice applying the course material. Please refer to Course Schedule for the due dates of each Assignment. Assignments are to be uploaded using the Assignment feature in Moodle. All Assignments should be submitted as a Word document. To facilitate organization of the assignments and grading, please name the document *LastName\_Assignment #*. So, for example, if Dr. Newcomer were submitted Assignment 1 she would call her Word document Newcomer\_Assignment 1. Please also put your name and assignment number on the top of the text of each assignment.

### Online Discussion Forums

Some weeks, students will participate in an online discussion forum to reflect on the week's topics. To get full credit for online discussion forum participation, students will need to post a thoughtful, well-written response to the prompt provided, and respond to at least two classmates' posts. Each discussion forum assignment is graded on a 10-point scale using the following rubric as a guide. Note that the grade assigned can be anywhere between 0 and 10; this rubric provides examples of evidence to support grading along the scale.

### **Discussion Forums Grading Rubric**

<b>Points:</b>	<b>10</b>	<b>7</b>	<b>3</b>	<b>0</b>
<b>Quality of the discussion forum posts &amp; replies</b>	Appropriate comments: thoughtful, reflective, and respectful of other's postings.	Appropriate comments and responds respectfully to other's postings	Responds, but with minimum effort. (e.g. "I agree with Bill")	No posting and no replied.

Rubric source: University of Central Florida's Teaching Online Pedagogical Repository, <https://topr.online.ucf.edu/discussion-rubrics/>

Please refer to Course Schedule for the due dates of each Discussion Forum posting, as these vary throughout the semester.

### Outbreak Investigation Case Study

Students will participate in an outbreak investigation in Week 6. This case study was prepared by the Centers for Disease Control and Prevention (CDC), and participation in the case study involves following along in an online module launched from the CDC's website and answering questions throughout the activity. The case study takes approximately 3 to 4 hours to complete; students may leave and come back to the case study as often as they would like. Students are welcome to work in small groups for this case study. Students will have the option of either submitting a screen shot of the completion screen showing "Passed" for all the modules within the case study, or students may submit a Word document with their answers to the 27 questions in the case study.

## Live Webinars

There are several Live Webinars scheduled for this course. These one-hour webinars will feature guest speakers and experts in various topics related to infectious diseases. The format will be a lecture by the guest speaker with time for questions and discussion with the students. **We strongly encourage students to attend these live webinars during their scheduled times.** Please see the course schedule below for webinar dates and times. For students who are not able to attend, webinars will be recorded and posted on Moodle. Viewing the webinars is mandatory, and the information presented will be assessed through assignments, discussion forums, and the midterm and final exams.

## Midterm and Final Exams

The midterm and final exams will be administered online via Moodle and will be in a multiple choice format. Once started, students will have 90 minutes to complete the exam. Exams are open book and open note.

The midterm exam will be available for students to take on Tuesday, October 11 and Wednesday, October 12. The midterm exam must be completed by midnight on Wednesday, October 12.

The final exam will be available for students to take starting Monday, December 12 and Tuesday, December 13. The final exam must be completed by midnight on Tuesday, December 13.

## **Additional Notes**

1. Changes: This syllabus is subject to change by the instructor. Any changes will be announced in the announcement section of Moodle.

Moodle will be used in this class and online activities will be required throughout the semester. Moodle procedures may be adjusted if necessary. While class content, expectations and assessment will (most likely) not change dramatically, the instructor may make mid-course revisions especially in response to student feedback.

2. Disability modifications: The Office for Disability Equity (ODE) is the campus resource for disability-related information. They provide consultation, training, and academic services to advance accessibility and inclusion by taking an intersectional approach to disability. For more information, please visit their website: <https://www.umt.edu/disability/>.

Students with disabilities will receive reasonable accommodations in this course. To request course modifications, please contact the instructor as soon as possible. The instructor will work with you and Disability Services in the accommodation process.

3. Student conduct code: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The University of Montana Student Code of Conduct (<https://bit.ly/3SMNkft>) embodies and promotes honesty, integrity, accountability, and duties associated with citizenship as a student in our community at the University of Montana. This Code exists to protect the interests of the community and dignity of its members, and to challenge those behaviors which are not in accordance with our policies. This Code describes

expected standards of behavior for all students, including academic conduct and general conduct, and it outlines students' rights, responsibilities, and the campus processes for adjudicating alleged violations.

Plagiarism is the representing of another's work as one's own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and may be remanded to Academic Court for possible suspension or expulsion. (See UM Student Conduct Code). Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed wording but also ideas. Acknowledgment of whatever is not one's own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's own original work is plagiarism.

4. Library resources: Some assignments may require library resources. To access the UM's Mansfield Library resources from off-campus, students will be required to enter their SCAUID and password. This is the same ID and password that you use to login to Moodle and use for your official UM e-mail address. Information on resources available through the Mansfield Library can be found at <http://www.lib.umt.edu>.



## Weekly schedule

Week Number: Class Dates	Topic(s) & Instructor	Readings, Webinars & Other Materials	Assignments & Due Dates
<b>1:</b> 8/29 – 9/4	Introduction to course & historical perspectives on infectious diseases  <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 1</li> <li>○ Posted readings</li> </ul>	<ul style="list-style-type: none"> <li>○ Assignment 1</li> <li>○ Due 9/7</li> </ul>
<b>2:</b> 9/5 – 9/11  *9/5: Labor Day	Principles of infectious disease epidemiology & study designs  <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 2</li> <li>○ Adams Chapter 3</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Thursday, 9/8</u> at 12 Noon Mountain time; Topic: Study Designs (Dr. Sophia Newcomer)</li> </ul>	<ul style="list-style-type: none"> <li>○ Assignment 2</li> <li>○ Due 9/14</li> </ul>
<b>3:</b> 9/12 -9/18	<ul style="list-style-type: none"> <li>○ Introduction to infectious disease modeling</li> <li>○ COVID-19 modeling</li> </ul> <i>Instructor: Dr. Landguth</i>	<ul style="list-style-type: none"> <li>○ Adams eChapter 17</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Tuesday, 9/13</u> at 12 Noon Mountain time; Topic: Modeling COVID-19 and Intro to Spatial Epi (Dr. Erin Landguth)</li> </ul>	<ul style="list-style-type: none"> <li>○ Assignment 3</li> <li>○ Due 9/21</li> </ul>
<b>4:</b> 9/19 – 9/25	<ul style="list-style-type: none"> <li>○ Infectious disease prevention</li> <li>○ Introduction to vaccines</li> </ul> <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 4</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Monday, 9/19</u> at 12 Noon Mountain time; Topic: COVID-19 Vaccines and Vaccine Immunology (Dr. Stephanie Lathrop)</li> </ul>	<ul style="list-style-type: none"> <li>○ Discussion Forum 1</li> <li>○ First posting by 9/23</li> <li>○ Two response postings by 9/26</li> </ul>
<b>5:</b> 9/26 – 10/2	Immune system and infectious disease  <i>Instructor: Dr. Landguth</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 6</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Tuesday, 9/27</u> at 12 Noon Mountain time; Topic: Influenza in Montana (Dr. Chris Migliaccio*)</li> </ul>	<ul style="list-style-type: none"> <li>○ Discussion Forum 2</li> <li>○ First postings by 9/30</li> <li>○ Two response postings by 10/3</li> </ul>
<b>6:</b> 10/3 – 10/9	Outbreak investigations  <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 5</li> <li>○ Adams Chapter 12 (optional)</li> </ul>	<ul style="list-style-type: none"> <li>○ Outbreak Case Study</li> <li>○ Due 10/12</li> </ul>

7: 10/10 – 10/16	<b>MIDTERM Exam</b> <i>Instructor: Dr. Newcomer</i>		<ul style="list-style-type: none"> <li>○ Midterm will be available 10/11 and 10/12</li> </ul>
8: 10/17 – 10/23	<ul style="list-style-type: none"> <li>○ Viral Infections</li> <li>○ Influenza</li> </ul> <i>Instructor: Dr. Landguth</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 8</li> <li>○ Posted readings</li> </ul> <u>Watch:</u> Evolution of Viruses (Dr. Doug Emlen**)	<ul style="list-style-type: none"> <li>○ No assignment</li> </ul>
9: 10/24 – 10/30	<ul style="list-style-type: none"> <li>○ HIV/AIDS</li> <li>○ Sexually transmitted infections</li> </ul> <i>Instructor: Dr. Landguth</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 9</li> <li>○ Adams Chapter 13</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Tuesday, 10/25</u> at Noon MT; Topic: STIs in Montana (Helen McCaffrey^ and Dr. Erin Landguth)</li> <li>○</li> </ul>	<ul style="list-style-type: none"> <li>○ Discussion Forum 3</li> <li>○ Posting by 10/28</li> <li>○ Two response postings by 10/31</li> </ul>
10: 10/31 – 11/6	Neglected tropical diseases <i>Instructor: Dr. Landguth</i>	<ul style="list-style-type: none"> <li>○ Adams Chapter 15</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Tuesday, 11/1</u> at Noon Mountain time; Topic: NTDs and Chagas Disease (Dr. Mario Grijalva*)</li> </ul>	<ul style="list-style-type: none"> <li>○ No assignment</li> </ul>
11: 11/7 – 11/13 *11/8: Election Day *11/11: Veterans Day	Vector-borne diseases <i>Instructor: Dr. Landguth</i>	<ul style="list-style-type: none"> <li>○ Chapter 11</li> <li>○ Posted readings</li> <li>○ <u>Live Webinar: Thursday, 11/10</u> at Noon MT; Topic: Biology of VBDs with Malaria introduction (Dr. Shirley Luckhart^*)</li> </ul>	<ul style="list-style-type: none"> <li>○ Discussion Forum 4</li> <li>○ Posting by 11/10</li> <li>○ Two response postings by 11/14</li> </ul>
12: 11/14 – 11/20	Special topics: Vaccine-preventable disease surveillance; Vaccine policy <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Posted readings</li> </ul>	<ul style="list-style-type: none"> <li>○ Assignment 4</li> <li>○ Due 11/23</li> </ul>
13: 11/21 – 11/27 <b>Thanksgiving Break</b>	<b>Relax &amp; Enjoy</b>		

<b>14:</b> 11/28 – 12/4	Special topics: Vaccine safety  <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Posted readings</li> <li>○ <u>Watch:</u> Vaccine Safety in the U.S., recorded presentation by Dr. Sophia Newcomer</li> </ul>	<ul style="list-style-type: none"> <li>○ Assignment 5</li> <li>○ Due 12/7</li> </ul>
<b>15:</b> 12/5 – 12/11	Special topics: Vaccination coverage and vaccine hesitancy  <i>Instructor: Dr. Newcomer</i>	<ul style="list-style-type: none"> <li>○ Posted readings</li> <li>○ <u>Watch:</u> Child and Adolescent Vaccine Coverage in Montana, recorded presentation by Dr. Sophia Newcomer</li> </ul>	<ul style="list-style-type: none"> <li>○ Discussion forum 5</li> <li>○ Posting by 12/9</li> <li>○ Two response postings by 12/12</li> </ul>
<b>16:</b> 12/12 – 12/16	<b>FINAL Exam</b>  <i>Instructor: Dr. Landguth</i>		<ul style="list-style-type: none"> <li>○ Final exam will be available 12/12 – 12/13</li> </ul>

^^ Dr. Stephanie Lathrop is an immunologist with the University of Montana Center for Translational Medicine.

\*\* Dr. Chris Migliaccio is a Research Associate Professor in Immunology in the Department of Biomedical and Pharmaceutical Sciences at the University of Montana.

\*\*\* Dr. Doug Emlen is a professor in the Division of Biological Sciences at the University of Montana.

^ Helen McCaffrey, MPH, is the HIV/HCV Epidemiologist at Montana DPHHS Communicable Disease Epidemiology Division.

^\* Dr. Shirley Luckhart is an expert in arthropod-borne infectious diseases. Her major focus is malaria, including innate immunity in the mosquito and mammalian host and interventions to block both disease and transmission. <https://www.uidaho.edu/cals/entomology-plant-pathology-and-nematology/our-people/shirley-luckhart>

\* [Dr. Mario Grijalva](#), is the director of the Infectious and Tropical Disease Institute and Professor of Microbiology at Ohio University. Dr. Grijalva is an internationally recognized expert on the spread of infectious diseases, specifically with regards to Neglected Tropical Diseases and Chagas disease.