

EPI 817 COMMUNICABLE DISEASE EPIDEMIOLOGY

FALL SEMESTER 2020

CLASS SYLLABUS

Time: T Th 8:30 AM - 9:50 AM

Location: Online - Zoom

Instructor: Lixin Zhang, Ph.D.
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Office Hours: By appointment

Course Website: <https://d2l.msu.edu/>

Course Description

This is a one semester, 3 credit Communicable Disease Epidemiology course. The course will cover core concepts in communicable disease epidemiology, methods used to determine disease frequency and risk, surveillance, outbreak investigation, and the epidemiology of important communicable diseases.

Course Prerequisites

Background in health science and epidemiology recommended.

Course Format

Lectures, readings, discussion, home work, oral presentation and written paper.

Learning Objectives:

General objectives:

- Enable students to identify issues specifically related to infectious disease epidemiology.
- Help students understand pathogen and transmission characteristics, and the descriptive epidemiology of infectious diseases.
- Help students understand pathogen, host, and environment characteristic interactions and how they produce disease patterns in the population.
- Enable students to apply these understandings to infectious disease prevention and control.

Specific objectives:

Upon completion of the course, the student should be able to:

1. Characterize historic and current burden of infectious diseases, and potential future trends.
2. Characterize the difference between viruses, fungi, bacteria, parasites, and prions, their measurement, natural history, and epidemiology.

3. Explain the different mechanisms of transmission as they relate to viruses, fungi, bacteria, parasites, and prions, and use examples to illustrate these differences.
4. Explain host immunity to pathogens and discuss the strengths and weaknesses of different vaccines.
5. Characterize relevant pathogen, host, environment/ecological features of important infectious diseases.
6. Explain the components of an infectious disease surveillance system, describe different types and purposes of surveillance, and discuss the strengths and weaknesses of different surveillance systems.
7. Explain the steps of an outbreak investigation and discuss features of different types of outbreaks.
8. Characterize the epidemiological features of hospital infections.
9. Explain the mechanisms and drivers for antimicrobial resistance.
10. Explain the utilities of microbiological and molecule methods in the epidemiologic investigation of infectious diseases.
11. Evaluate the pros and cons of different prevention and control measures, select the most appropriate measure, and be able to justify that selection.

Readings and useful reference books

- Articles posted throughout the course
- Control of Communicable Diseases Manual; 20th Ed. 2015 (David L. Heymann, ed.)
- Infectious Disease Epidemiology: Theory and Practice 3rd Edition. 2014 (K. E. Nelson, C. M. Williams, eds.).
- Epidemiology: An Introduction; 2nd Ed. 2012 (Kenneth Rothman)

Course Grading

Class attendance, reading and discussion of assigned papers, homework assignments, a midterm exam, an oral presentation, and a term paper.

Grade:

Class attendance and participation:	10%
Homework:	10%
Exam #1:	25%
Exam #2:	25%
Oral presentation:	10%
Finals: Term paper:	20%

Students are required to attend every class. Any absence must be discussed with Dr. Zhang ahead of time.

Class schedule (Subject to change)

Class	Date	Lecture and Discussion Topic	Reading
1	9.3	Introduction; historic and current burdens of infectious diseases	Will be posted before class
2	9.8	Emerging & re-emerging infectious diseases: coming trend	
3	9.10	Infectious disease causal model: Agent, host, and environment	
4	9.15	General principles in infectious diseases ; transmission routes; epidemiological measures on infectivity	
5	9.17	Infectious agents intro	
6	9.22	Immunity and vaccine	
7	9.24	Study designs and examples	
8	9.29	Polio from past to current: lessons learned	
9	10.1	Epidemiology of hospital infections	
10	10.6	Infectious disease surveillance	
11	10.8	Exam#1	
12	10.13	Introduction to outbreak investigation	
13	10.15	In class outbreak investigation case study -1	
14	10.20	In class outbreak investigation case study -2 (report prep)	
15	10.22	Group reports on outbreak investigation case studies	
16	10.27	Public health microbiology and Molecular Epidemiology	
17	10.29	Antimicrobial resistances	
18	11.3	Airborne transmitted diseases	
19	11.5	Fecal-Oral, Food/water transmitted diseases	
20	11.10	Diseases of contact transmission, STD	
21	11.12	Environment and infectious diseases patterns	
22	11.17	Ecology of infectious diseases	
23*	11.19	Susceptible host populations	
24	11.24	Exam#2	
25	11.26	Thanksgiving – no class	
26	12.1	Social factors and infectious disease patterns	
27	12.3	Infectious disease specific epidemiology Presentation 1	
28	12.8	Infectious disease specific epidemiology Presentation 2	
29	12.10	Infectious disease specific epidemiology Presentation 3	
	12.15	Papers due	

Academic Integrity

Students are expected to adhere to standards of academic conduct. Please visit <https://www.msu.edu/unit/ombud/academic-integrity/> or consult your student handbook to review MSU policies, regulations and ordinances regarding academic honesty and integrity.

Use of course materials: This course adheres to the MSU policies regarding the intellectual property of course materials and the use of social media in the classroom. In brief, all course materials are the copyrighted property of the course instructor. Without the written consent of the instructor, students may not: 1) record lectures or any other classroom activities, or 2) post course materials online or distribute them to anyone not enrolled in the class. Any student violating the conditions described above may face academic disciplinary sanctions. However, students may and are encouraged share course materials with other students enrolled in the class to enhance their learning experience. More information about this policy can be found at: <http://acadgov.msu.edu/university-council/minutes/draft-minutes-march-25-2014>.

Please visit website at honorcode.msu.edu to learn more about how the Spartan Code of Honor academic pledge. On the website, students are urged to take the pledge, where they can publicly display their commitment to academic honesty with fellow Spartans. Testimonials and resources are also available to both faculty and students, along with locations to improve work ethics, study resources, as well as information related to the Ombudsperson's office and much more.

The Spartan Code of Honor academic pledge:

"As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do."