

Syllabus

Epidemiology 758, Summer 2015

Principles and Methods of Applied Infectious Disease Epidemiology

Overview

This introductory course will cover principles and methods of applied infectious disease epidemiology. You will learn about infectious disease terminology and epidemiology. You will also learn about immunity, how researchers study infectious diseases, and about the distribution, risk factors and causes, transmission, and control of selected infectious diseases. At the end of the course, you will learn about infectious diseases of global importance and about the emergence or re-emergence of infectious diseases.

Course Objectives

After completing this course you will:

- Understand the interaction between an infectious agent, host, and the environment
- Learn about modes of infectious disease transmission and what affects transmission
- Apply the principles of infectious disease transmission dynamics
- Understand the role of immunity in infectious disease epidemiology
- Apply course concepts to areas such as bioterrorism preparedness and disease elimination strategies

Teaching Methods

In a course such as this, the lecture method of teacher-centered expository discourse relegates students to the role of listeners who are not actively engaged in the learning process. Higher-level learning requires the student to become actively involved in applying concepts and methods to problems and to exercise critical judgment by attempting to reach a solution or draw conclusions when faced with a complex set of findings. These higher-level thinking skills will be continuously called upon in the cooperative learning classroom method, used throughout this course.

Cooperative learning is an instructional technique that brings students together in small, fixed groups to work on structured learning tasks. It enables all students to become more involved with the course material and to articulate their understanding of this material through problem-solving exercises with other members of their group. Students "who become involved in active discussion of their ideas with other students are more likely to have less irrelevant or distracting thoughts and spend more time synthesizing and integrating concepts than students who listen to lectures" (Bligh DA. What's the Use of Lectures. Penguin Press, 1992). Student-to-student interaction is positively related to critical thinking outcomes and to study habits characterized by more active thinking and less rote memorization (Smith DG. College classroom interactions and critical thinking. J Educ Psych 1977;69:180-190.)

Based on these pedagogical principles, this course has been organized such that:

- All course materials are found on the Internet.
- Students will be assigned to small learning groups, typically 8 to 10 students per group. These learning groups will meet in our "virtual" classroom on the Internet.
- Evaluation of student performance is based on:
 - Completing course modules (Please check your schedule for dates.)
 - Three group projects (Please check your schedule for dates.)
 - A final individual capstone project (Please check your schedule for dates).

In most real-life problems, there is no one "right" answer but several different ways to address problems; some of these ways are more efficient, more constructive, and more long-lasting than others. An important lesson to learn from the experience of cooperative learning is that most solutions to community problems are more effective when the solution is reached by a team effort that actively engages all members of the team in addressing the problem and encourages creative thinking of the team in proposing a solution. This process converts learning from an individual to a social activity and draws on the collective wisdom of those attempting to reach a solution.

Because of the independent nature of this class, teams must learn to function largely independently using the lecture materials and the experience and knowledge of team members as their major resource to engage in each exercise. The best professional teams know how to use the resources of consultants, the literature, and the wisdom of the team to arrive at their own solutions. The point is, the faculty are not going to give you answers, but they are there to steer you, as a consultant would, on a path toward reaching your own team answers.

Course Format

Four Modules

The modules are a combination of self-paced and/or group activities. There is also one final individual capstone project.

Self-paced Activities

For each module you have a certain amount of time to complete the individual activities (lectures, readings, case studies and short module quizzes). This time varies per module but ranges between 1 and 3.5 weeks. You can work at your own pace during that time to complete the activities. There are no weekly group discussion forums in this course. However, in the first module you have an opportunity to introduce yourself to your group in the "Introductions" discussion forum and do a team-building exercise as well as the module 1 group project. This forum is also a good place to discuss your schedules for the semester in regards to the group projects. Please check the course schedule for due dates for all activities.

- Lectures: Each module has audio lectures.

- Readings: The required and suggested readings are either downloadable documents or URLs linked in the course website.
- Case studies: Modules 1-3 have case studies. Module 4 does not have any case studies.
- Module quiz: All modules have a short self-grading quiz.

Group Projects

There are three group projects during the semester (in Modules 1, 2, and 3). The group projects make use of group discussion forums on Sakai. The completed group project document is submitted via Sakai to the faculty for the modules 1 and 2 projects. In Module 1, the end product of the lesser-known diseases project is a document which will be posted on a special discussion board where all students in the course can view and make comments. For the module 3 project, students will participate in a group online discussion forum but then will submit individual paragraphs rather than a group document. Details about each project can be found in the module folder when it is available.

Individual Capstone Project

The final individual capstone project fall is at the end of the course. This project is governed by the UNC Honor Code.

Course Resources

All course resources are located on the course Sakai website: including ERIC Notebooks (basic epidemiology methods periodical), additional handouts and readings; links to journal articles or other readings on the Internet; and the instructions for case studies, the individual capstone project, and group projects.

Course Policies and Expectations

Time Commitment for this Course

We'd like to take a bit of time to explain the time commitment that will be involved for this course. An Internet course, while convenient for those who reside all over the world, can sometimes be thought of as an "easier" course than a classroom course. However, an Internet course requires at least the same time commitment from students as residential courses. You will be embarking on case studies, working on multiple group projects (with group discussion forums), and completing your individual capstone project. These activities require time and thought, and we do not suggest waiting until the last minute to complete a module.

On average, previous students in this course spent **approximately 9 to 12 hours per week** on coursework. However, some weeks require more time than others, such as weeks coinciding with due dates for case studies, quizzes, group projects or the final individual capstone project.

Adequate Computer Access and Working Email

Please make sure that you have adequate computer access. You should be checking the course Web site at least every other day or so. Messages will also be sent at least weekly from the faculty, so please make sure that your inbox is not full. Note: If you haven't received a course message in more than a week, you should probably check your email to make sure it is working or not full.

Computer Problems

Because module activities and individual and group projects are many weeks in length, computer problems are *not* considered emergencies. If you're working on a project, be sure to save your work to a back-up CD, flash drive, or something equivalent so that you'll be able to submit it using another computer.

Minimum Technical Requirements

Please read over the [minimum technical requirements](#) for this course.

Course Schedule

Sometimes unexpected events occur (e.g. depending on your geographic location: snow storms, power outages, etc.); therefore, we reserve the right to modify the syllabus. These modifications will be announced as quickly as possible so that students can adjust their schedules. The weekly course schedule is provided on the syllabus page in Sakai.

Grading and Evaluation

Grading Policy, Formatting Policy, Due Dates, and Late Penalties

Unless otherwise noted, everything is due by 11:59:00 PM Eastern Time (ET) on the due date.

No late group projects will be accepted without a previously agreed-on extension from the course faculty. Out of consideration for classmates and their grades, all group members should contribute their best effort to assuring that the project is completed on time.

All group projects are due by **11:59:00 PM ET on the date in the course schedule**. You will have access to each project for at least two weeks and should be able to complete them in a way that fits your schedule. Late projects will have 10 points deducted for every day that they are late. In the event of an emergency, exceptions to this policy may be made. Considering the length of time you have to work on the projects, computer problems are *not* considered emergencies. If you're working on a project, be sure to save it to a back-up CD, flash drive, or something equivalent so that you can submit it using another computer.

Group Project Grades: Students who do not participate at all in the group discussion boards will not receive any group project points. Students who post to the discussion board but do not make posts or contributions of substantial content may also receive a significant reduction in their

group project score or even a score of zero if merited. (An example of a 'not substantial' discussion board post would be 'good job group'). In both of the scenarios described above, students in these categories may also receive poor evaluation scores. In other words, typically all members of a group receive the same grade for the group project document, however, students who do not adequately contribute to the group work should expect a reduced grade.

Withdrawing from the Course

If you decide to withdraw from the course at any time, you must notify:

Brettania Lopes (lopes.blw@unc.edu) and the registrar for your program

Grading Scale for the Course

94 and above	H
65-93	P
50-64	L
Below 50	F

Evaluation of Student Performance

Your grade in the course will be determined as a weighted average of your scores (after each is converted to a 0-100% scale) for the following activities:

30% total from the 3 Group Projects:

Each group project grade will be based on two components. These are (1) the document itself and (2) the peer evaluation. For modules 1 and 2, a group document will be submitted. For module 3, you will participate in a group online discussion forum but then will submit individual paragraphs rather than a group document. For modules 1 and 2, the course faculty will evaluate the product of the group work while for module 3 the course faculty will evaluate your individual paragraphs. For modules 1, 2 and 2, your peers in your group will evaluate you on your contributions to the group discussion/project, which range from bringing up salient points for group consideration, to finding important information to include in the project, to actually writing or editing the final document. If you fail to complete peer evaluations for modules 1 or 2, you will lose 15% from your group project grade. If you fail to complete peer evaluations for module 3, you will lose 15% from your individual paragraphs grade. Summarized, the breakdown is as follows:

Document itself 85%
Peer evaluation 15%

6% from the first Group Project (Icebreaker / Lesser-Known Diseases)

The first project is designed to introduce you to the other students in your group and to allow you to learn more about a disease that is not commonly known.

12% from the second Group Project (Transmission Dynamics)

12% from the third Group Project (Interventions and Elimination)

For this group project you will participate in an online group discussion forum and you will then submit individual paragraphs. There is no group document to submit for this project.

30% from the Case Studies

There are case studies to complete for modules 1-3. You will be given a grade of pass or fail (score of 1 or 0) based on your case study answers. Answers will be reviewed for completeness. You will receive a score of 1 if all parts of each question have been answered. You will receive a score of zero if the case study is not submitted, if any questions were not answered, or if a case study is submitted late. **Please note: immediately after you submit your case study on Sakai, please look for the link to appear to download the case study model answers.** The course professor, Brettania Lopes, will review the class's performance and send out one email to all students with a detailed discussion of common mistakes and problems if needed. If, after reviewing the email, you have any questions about the case study, please send an email to Brettania Lopes.

10% from the End of Module Quizzes

The four end-of-module quizzes will be based on the lectures and/or case studies in the module and will generally be in the form of multiple choice questions. Upon completion you will receive your grade automatically on Sakai. If you have any questions about your quiz grade please Brettania Lopes. Quiz late submission penalty: 1 point deducted per day late. 3 days after the quiz due date the quiz will be closed and no submissions will be accepted.

30% from the individual Capstone Project

At the end of the semester you will submit your individual final capstone project. The UNC honor code applies when you are working on this individual project.

Note there is no final exam in this course, there is just this final individual capstone project.

Course Assignment Formatting Requirements

Unless otherwise indicated in an assignment use single space 12 point font Arial with 1” margins. Page length will be indicated in assignment instructions.

Peer Evaluation Criteria

At the end of each of the 3 group projects, you will be required to complete and submit a peer evaluation for each of your group members (see the course schedule for dates to submit the peer evaluations). The purpose of the peer evaluation is to evaluate each of your group members on her/his performance as a group member in completing group assignments and/or discussion. The peer evaluation is completed once after each group project. The link to complete peer evaluations will be available within Sakai.

In the peer evaluation, you will be asked to rate individual group members on each of the following five statements:

- This group member actively participated in group assignments.
- This group member accomplished tasks on time.
- This group member's work reflected an acceptable level of thought and effort.
- This group member functioned as a valuable member of the group by supporting the efforts of fellow group members.
- This group member would make an excellent project manager for this group.

You will evaluate group members using the following five-point Likert scale:

- Strongly Agree = 5
- Agree = 4
- Neither Agree nor Disagree = 3
- Disagree = 2
- Strongly Disagree = 1
- Not Applicable = 0

Note: When you evaluate group members on the final statement (This group member would make an excellent project manager for this group) please do this evaluation whether or not the student was the project manager. In other words, if the student was the project manager then evaluate their performance as project manager. However, if the student was not the project manager then evaluate them based on what you think their *potential* is to be an excellent project manager, based on how the student conducted himself or herself and how the student performed during the group work.

In addition to the five statements, the peer evaluation has an open-ended question in which you can write specific comments on the performance of each of your group members.

Honor System

As part of the UNC Honor Code, students pledge to maintain ideals of academic honesty, personal integrity, and responsible citizenship. Please review the [UNC Honor System](#) and make sure you understand and adhere to these policies in this course.

Valuing, Recognizing, and Encouraging Diversity

This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity.

Competencies Addressed

This course was developed using both the Applied Epidemiology Competencies developed by CDC/CSTE and the Public Health Epidemiology Competency Set developed by the Northwest Center for Public Health Practice at the University of Washington. Upon completion of this course a student should be able to demonstrate competencies as listed below. Through successful completion of coursework, students can document progress toward achieving these competencies.

Assessment and Analysis*

1. Recognize public health problems pertinent to the population
2. Assist in developing recommended evidence-based interventions and control measures in response to epidemiologic findings

Infectious Disease Concepts**

1. Define concepts commonly used in infectious disease epidemiology
2. Describe classifications and characteristics of infectious disease agents
3. Describe characteristics of disease hosts relevant to infectious disease acquisition
4. Describe the role of the environment in infectious disease acquisition
5. Describe the role of vaccination in infectious disease prevention

*Copied verbatim from CDC/CSTE Applied Epidemiology Competencies, <http://c.ymcdn.com/sites/www.cste.org/resource/resmgr/Workforce/AECTier2.pdf>

**Copied verbatim from Public Health Epidemiology Competency Set Developed by: Northwest Center for Public Health Practice <http://www.nwcphp.org/training/tools-resources/uw-epidemiology-competencies/>

UNC Department of Epidemiology Principles and Methods of Applied Infectious Disease Epidemiology Course Schedule, Summer 2015

 indicates individual assignments that are turned in.
The dates indicate when the individual assignments are due.

Module 1: Introduction and Host, Agent, and Environment (2 Weeks) May 13 to May 26

5/13	Wednesday	Course Opens on Sakai, 5pm	
5/18	Monday	Part of Group Project (Icebreaker introduction) Due <input type="checkbox"/> <i>Introduce yourself on the discussion forum tab. Get to know your group's other members.</i>	
5/18	Monday	Course Introduction and Welcome Meeting <i>The faculty will host this optional online LiveMeeting from 5pm to approximately 6pm Eastern. Come learn about the course topics and meet the faculty.</i>	
		Lecture and Video 1. The Host, Agent, and Environment Epidemiologic Triangle 2. Epidemiology on the Ground	
		Required Readings 1. Social and Environmental Risk Factors in the Emergence of Infectious Diseases 2. Seasonal Variation in Host Susceptibility and Cycles of Certain Infectious Diseases	
5/26	Tuesday	Quiz Due (take quiz via the Tests & Quizzes tab in Sakai) 1. The Host, Agent, and Environment Epidemiologic Triangle <input type="checkbox"/>	
5/26	Tuesday	Group Project (Team name / Lesser-Known Disease) Due <i>Your team should have agreed on a team name by now and completed this group project on a lesser-known disease. One group member should submit the project via the Assignments tab in Sakai.</i>	
5/26	Tuesday	Group Project Peer Evaluations Due <input type="checkbox"/> <i>The online evaluation form will be available in Sakai under the Course Materials tab (Module 1, Group Project folder) after 1am Eastern on Sunday, May 24.</i>	

Module 2: Disease Transmission and Transmission Dynamics (4 Weeks) May 27 to June 23

		Lectures 1. Modes of Transmission 2. Infection and Immunity 3. Transmission Dynamics	
		Required Readings 1. Leishmania in Discarded Syringes from Intravenous Drug Users 2. Sharing Needles May Produce Artificial Leishmaniasis Cycle 3. Adolescent and Adult Pertussis Vaccination: Computer Simulations of Five New Strategies	
6/22	Monday	4 Case Studies Due (submit via the Assignments tab in Sakai) 1. Thanksgiving Outbreak <input type="checkbox"/> 2. Febrile Illness and Leptospirosis <input type="checkbox"/> 3. Avian Flu <input type="checkbox"/> 4. Transmission Simulator <input type="checkbox"/>	
6/22	Monday	Quiz Due (take quiz via the Tests & Quizzes tab in Sakai) 1. Transmission Dynamics <input type="checkbox"/>	
6/22	Monday	Group Project (Transmission Dynamics) Due <i>One group member should submit the project via the Assignments tab in Sakai.</i>	
6/22	Monday	Student Evaluation of the Course Faculty Due <input type="checkbox"/> <i>The online evaluation form will be available in Sakai after 1am Eastern on Monday, June 16.</i>	
6/23	Tuesday	Group Project Peer Evaluations Due <input type="checkbox"/> <i>The online evaluation form will be available in Sakai under the Course Materials tab (Module 2, Group Project folder) after 1am Eastern on Sunday, June 21.</i>	

Module 3: Control of Infectious Diseases (3 Weeks) June 24 to July 14

		Lectures <ol style="list-style-type: none"> 1. Host Defenses and Infection 2. Vaccines and Drugs 3. Animal Bites and Rabies 4. Principles of Elimination and Eradication 	
		Required Readings <ol style="list-style-type: none"> 1. Principles of Disease Elimination and Eradication 2. Achievements in Public Health, 1900-1999: Control of Infectious Diseases 	
7/13	Monday	2 Case Studies Due (submit via the Assignments tab in Sakai) <ol style="list-style-type: none"> 1. Tick-borne Infectious Diseases <input type="checkbox"/> 2. Disease Eradication <input type="checkbox"/> 	
7/13	Monday	Quiz Due (take quiz via the Tests & Quizzes tab in Sakai) <ol style="list-style-type: none"> 1. Control of Infectious Diseases <input type="checkbox"/> 	
7/13	Monday	Group Discussion Ends and Individual Paragraphs (Interventions and Elimination) Due <input type="checkbox"/> <i>Each student should submit their individual paragraphs via the Assignments tab in Sakai.</i>	
7/14	Tuesday	Group Project Peer Evaluations Due <input type="checkbox"/> <i>The online evaluation form will be available in Sakai under the Course Materials tab (Module 3, Group Project folder) after 1am Eastern on Sunday, July 12.</i>	

Module 4: Special Topics in Infectious Disease Epidemiology (2 Weeks) July 15 to July 24

		Lectures <ol style="list-style-type: none"> 1. Special Topics in Infectious Disease and Public Health 2. Infection as a Risk Factor for Coronary Artery Disease 3. Infectious Diseases of Global Health Importance: Emerging and Re-emerging Infectious Diseases 	
		Required Readings <ol style="list-style-type: none"> 1. Global Trends in Emerging Infectious Diseases 2. Diarrheal Diseases 	
7/24	Friday	Quiz Due (take quiz via the Tests & Quizzes tab in Sakai) <ol style="list-style-type: none"> 1. Special Topics in Infectious Disease Epidemiology <input type="checkbox"/> 	
		No Case Study for This Module	
		No Group Project for This Module	

Capstone Project July 10 to July 24

7/24	Friday	Capstone Project (Control of Infectious Diseases) Due <input type="checkbox"/> <i>Please note that this project requires significant effort and constitutes a major portion of your grade. Begin work well before the due date to ensure you have adequate time to complete the project. Materials for the capstone project will be available in Sakai after 1am Eastern on Friday, July 10.</i>	
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Note that other online Live Meetings may be scheduled during the course. If there are other meetings, these meetings will always be recorded, archived and available on Sakai for students who cannot attend the meetings in person.