

**ANFS 230**  
**Foodborne Diseases: Investigating Outbreaks**  
**3 credits**  
**Fall 2014**

**Instructor:** Kali Kniel, Ph.D.      **Phone:** 302-831-6513  
**Email:** kniel@udel.edu  
**Office:** 019 Townsend Hall  
**Office hours:** Please email for appointment

**Class schedule:** 11:15 – 12:05 MWF, Colburn Lab Room 102

This course will explore the “hows” and “whys” of foodborne outbreak investigation. This includes examining current outbreaks and real-life situations using principles of epidemiology; while highlighting the importance of all investigative roles, including the epidemiologist, public health worker, and laboratory scientist. Also, through individual and group problem solving and research, participants will examine case studies while learning to use surveillance, detection, and investigative skills to solve an outbreak. Additionally, ways in which this information should be communicated to the public will be addressed.

**Course Student Learning Outcomes:**

1. Have an understanding of the complex processes involved in outbreak investigation and be familiar with the epidemiology and traceback techniques used to resolve an outbreak.
2. Be more familiar with many of the organisms responsible for current foodborne illnesses.
3. Gain an increased awareness of outbreaks of foodborne illness and be able to critically evaluate the coverage of foodborne illness by popular media.

**Program Student Learning Outcomes:**

1. In this course students will develop critical thinking and reasoning skills as they learn the science used in developing food safety risk assessment and in evaluating the epidemiological and environmental aspects of foodborne outbreak investigations (*ANFS Critical Thinking Goal, Gen Ed Goal 2*).
2. Students will develop intellectual curiosity concerning the truth and bias behind contemporary media in communication of scientific principles (*ANFS Communications Goal, Gen Ed Goal 6*).
3. Students will also demonstrate successful and effective written and oral communication skills by writing literature reviews and investigation reports and by participating in course discussions (*ANFS Communications Goal, Gen Ed Goal 1*).
4. Students will develop team-working skills and leadership in the development of a board game and in the presentation of that game (*ANFS Communications Goal, Gen Ed Goal 1 & 3*).

**Books:**

1. *Procedures to Investigate Foodborne Illness* by International Association of Food Protection, Sixth Edition 2011, published by Springer.

2. *Poisoned: The True Story of the Deadly E. coli Outbreak That Changed the Way Americans Eat*, by Jeff Benedict

A third book is optional and is available in the library or may be borrowed from Dr. Kniel. This text book contains general scientific information 3. *Food Microbiology: An Introduction* by T. Montville, K. Matthews, K. Kniel, Third Edition 2012, published by ASM Press. *Optional*

**Learning Management System:** We will use Canvas for course resources and assignments. You can log onto canvas at <http://www.udel.edu/canvas/>. Many of the lecture outlines, slides, or overheads will be posted on the class website. Selected readings will be available on the website as pdf files. These files should be accessed and read before coming to class.

**Class Participation and Attendance:** Students should come to class prepared for discussion and the day's activities. During the semester, in-class group and individual activities are planned as well as occasional homework assignments. Regular attendance is encouraged. If you are unable to attend class you are expected to inform the instructor as early as possible. In-class activities and case studies are an important part of this course. If you miss class, you do not get credit for participation in the activity, which may in turn affect your group assessment grade. If you are absent from class, it is your responsibility to obtain class notes from a fellow student. Homework is due at the start of class on the due date. Points will be deducted for late homework. You are encouraged to become familiar with the University Policy on Class Attendance found in the "Student Guide to University Policies" (<http://www.udel.edu/stuguide/04-05/index.html>). The content of the guide applies to this course.

**Examinations:** There will be four written exams during the semester. Examinations will consist of fill-in-the-blanks, short answers, graphs, and short essay questions similar to what is covered during in-class activities. If you miss an exam during the semester, a make-up exam consisting of five twenty-point essay questions will be given to students who must miss an exam for a valid, documented reason.

**Assignments:** Written homework assignments will be explained and handed out periodically in class. Assignments will include questions on epidemiology and on case studies similar to what is done in class and short writing assignments. A longer assignment on the novel *Poisoned* is due on October 22. A rubric will be handed out in class and will be available online for this assignment. Most but not all homework assignments are noted on the schedule. Six assignments are indicated on the syllabus. Other shorter assignments may be handed out in class and also made available online during the semester. Every attempt will be made to hand out materials in class and online.

**Final Project:** Each group of students will design a case study that can be played in the form of a game. Your team may create a board game or a virtual game. You may be creative in the development of the game. Your peers playing the game should be able to see how an outbreak is investigated and resolved. Each group of students will work together to accomplish the tasks for the final project, some of which can be performed in class. Additionally, it will likely be necessary to

meet outside of class to work on the project. The final projects will be presented during the final exam date. Peer review and group assessment are part of your final grade.

**Twitter:** The world of food safety and monitoring foodborne illness has become complicated. Information is available nearly 24-7, and so to take advantage of this you are invited to follow Kali@kalikniel at [www.twitter.com](http://www.twitter.com). More information will be made available during the semester.

**Grade scale:** Straight arithmetic average with 100-93 an A, 92-90 an A-, 89-88 a B+, 87-83 a B, 82-80 a B-, 79-78 a C+, 77-73 a C, etc.

**Grading:**     Exams (60%) : Four non-comprehensive exams 15% each

Take-home assignments (28%)  
                  Homework assignments 18%  
                  Comment on *Poisoned* 10%

Final Project (12%)  
                  Group game project and presentation 10%  
                  Peer evaluation 2%

**Academic Honesty:** Academic dishonesty in any form will not be tolerated. Students are encouraged to become familiar with the University's Policy on Academic honesty found in the Student Guide to University Policies (<http://www.udel.edu/stuguide/04-05/code.html#honesty>). The content of the guide applies to this course. Responsible computing guidelines can be found at <http://www.udel.edu/stuguide/04-05/code.html#respcomp>.

**Code of Conduct:** Guidelines for appropriate conduct can be found at <http://www.udel.edu/stuguide/04-05/code.html#code>. Electronic devices should be turned off and not accessed during class, including cellular phones, pagers, and personal digital assistants. Students are encouraged to arrive at class on time as announcements will be given at the beginning of class.

**Support Services:** The instructor is willing to give help if and when needed. Questions are welcomed in and out of class or via email. Do not wait until the morning of an exam to seek help. Other support can be found at:

                  Academic Services Center: <http://www.udel.edu/ASC/>  
                  Writing Center: <http://www.english.udel.edu/wc/>  
                  Library: <http://www.lib.udel.edu/>  
                  Computer Center: <http://www.udel.edu/sites/>

Foodborne Diseases: Investigating Outbreaks  
**Course Calendar**

*The lecture schedule is tentative. Topics may be omitted or added. Changes will be announced in class. The reading is what will be discussed that day in class. Additional reading material will be placed online.*

<b><u>Date</u></b>	<b><u>Topic</u></b>	<b><u>Reading &amp; More</u></b>
Aug. 27 W	“A Taste of Food Poisoning”	<i>Why Don't We Learn from Our Mistakes</i>
Aug. 29 F	Introduction to Food Safety, Surveillance, and Food Microbiology	<i>Procedures</i> pp.1-20 ( <i>FM chapters 1-2</i> )
Sept. 1 M	<i>Labor Day – No Class</i>	
Sept. 3 W	Continuing with Food Microbiology & Safety	
Sept. 5 F	Introduction to the Epidemiological Investigation	<i>Procedures</i> pp. 20-44, Tables pp. 80-138 ( <i>FM chapter 7</i> )
Sept. 8 M	Conducting an environmental investigation <i>Local Outbreak Exercise Homework assigned</i>	<i>Procedures</i> pp. 44-63 ( <i>FM chapters 4-5</i> )
Sept. 10 W	Discovery of causes and reduction strategies Epidemiology problem/discussion- Investigating a Church Supper	
Sept. 12 F	Epidemiology investigation example	Local Outbreak Exercise due
Sept. 15 M	Environmental investigation example	
Sept. 17 W	Summarizing the investigation	<i>Procedures</i> pp. 69-77
Sept. 19 F	<b>EXAM 1</b>	
Sept. 22 M	Overview of <i>Salmonella</i> outbreaks Low moisture foods	( <i>FM chapter 14</i> ) Begin working on Outbreak Concentration Game
Sept. 24 W	<i>Salmonella</i> and almonds Environmental investigation and Regulatory impact	
Sept. 26 F	Multi-drug Resistant <i>Salmonella</i> in ground beef and ground turkey	

Sept. 29 M	<i>Salmonella</i> and the PCA scandal	
Oct. 1 W	<i>Salmonella</i> , tomatoes, and cantaloupe Investigation and the role of research	
Oct. 3 F	<i>Salmonella</i> in spices, seafood and pine nuts, and what else?	
Oct. 6 M	Overview of <i>Clostridium botulinum</i> outbreaks	(FM chapter 3 and 10) Podcast with online assignment
Oct. 8 W	2006 Carrot juice outbreak 2007 Castleberrys outbreak	
Oct. 10 F	<b>EXAM II</b>	
Oct. 13 M	Prion Biology	(FM chapter 24 -prions)
Oct. 15 W	Epidemiological investigations of BSE	
Oct. 17 F	<i>E. coli</i> O157:H7 Review of outbreaks	(FM chapter 12)
Oct. 20 M	Personal impact of O157	Video
Oct. 22 W	Litigation of O157:H7 Where it all began	Poisoned paper due
Oct. 24 F	<i>E. coli</i> O157:H7 Spinach outbreak 2006	
Oct. 27 M	<i>E. coli</i> non-O157 STECs	
Oct. 29 W	<i>E. coli</i> O157:H7 Petting zoos	
Oct. 31 F	<i>E. coli</i> non-O157 STECs	In-class/take-home exercise
Nov. 3 M	<i>E. coli</i> O157:H7 in Cookie Dough	
Nov. 5 W	<b>EXAM III</b>	
Nov. 7 F	Overview of <i>Listeria monocytogenes</i> outbreaks and the role of sanitation	(FM chapter 13 and 29)
Nov. 10 M	Current <i>Listeria monocytogenes</i> concerns	
Nov. 12 W	Norovirus	(FM chapter 24 -virus)

Nov. 14 F	Cruise ship misery (VSP)	
Nov. 17 M	Hepatitis A overview of outbreaks	In-class/take-home exercise
Nov. 19 W	Intentional Contamination Issues Biological and chemical agents of terrorism	Anthrax investigation homework
Nov. 21 F	<i>Cyclospora</i> basil outbreaks	(FM chapter 23)
Nov. 24 M	<i>Cyclospora</i> raspberry outbreaks <i>Cyclospora</i> outbreak of 2013	
Nov. 26 W – Nov. 28 F	Happy Thanksgiving Break 	Be safety conscience with your leftovers
Dec. 1 M	<i>Cryptosporidium</i> outbreaks	Anthrax homework due
Dec. 3 W	<b>EXAM IV</b>	
TBA	<b>Final Group Project Presentations</b>	