

## **FST 5634G- Advanced Epidemiology of Food and Waterborne Diseases**

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Office Hours	9-10 am F or as arranged		

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### **Description:**

Overview of causes, transmission, and epidemiology of major environmental, food-, and water-borne diseases. Outbreak and sporadic detection, source tracking and control of pathogens. Overview of the impact of foodborne outbreaks on regulatory activities at the local, state, national and global level.

### **Goals:**

Upon completion of the course, students will be able to:

- A. Describe the role and impact of potential environmental contaminants on the safety of food from the origin of the food in the field to retail purchase across diverse agriculture scales (local, state, national, and global).
- B. Relate environmental pathogen transmission patterns to prevention of food-borne disease.
- C. Identify an outbreak, and determine risk of exposure to the public.
- D. Develop strategies for monitoring and control of food- and water-borne diseases in the food industry.
- E. Relate microbiological methods used during routine surveillance and monitoring to the safety of food products.
- F. Identify the role of consumers, industry and regulatory agencies in prevention and control of food and water borne disease
- G. Recognize economic costs of food and water borne illness across diverse agriculture scales (local, state, national, and global).
- H. Identify sources of food safety and food biosecurity information and distinguish reliable sources from unreliable sources.
- I. Apply scientific literature to critically evaluate the practices of legal and regulatory issues on food safety.

### **Format:**

This course includes recorded voice over powerpoint presentations by the instructor, as well as reading, written and oral assignments. Students will apply the information from the early lectures to investigate outbreaks through case studies throughout the semester. Students will read current scientific articles each week and either prepare an online recorded presentation (1x per student) or participate in a discussion board. Students wishing for touch points with the material are encouraged to attend office hours regularly.

### **Meeting Times:**

This is a non-synchronous online course so there are no set meeting times. However, you should treat this class as a 4 credit hour course, which has an expectation you spend at

least 200 min on the course material each week. You can manage this based on your needs. Some examples: 4 50 min sessions, 2 75 min sessions and 1 50 minute session, 2 100 minute sessions or 7 29 min sessions. There is lots of flexibility, but I stress the need to keep up with materials. Each week there will be small quizzes and discussion board posts due on Sundays at 11:59PM that cover the materials for the week. **ALL ASSIGNMENTS WILL HAVE DUE DATES IN EST.**

**Office hours:**

I value my interactions with my students, but I recognize that the demands on my student's time while pursuing their degree make a set time un-attainable for some. I am flexible and can find time in my schedule to accommodate a zoom meeting outside of the set office hours time. If you can make the scheduled time, I highly encourage you to attend each week to discuss the material. Students report that regularly attending office hours helps them to feel more engaged in the material and less alienated if they are struggling with a concept. If you are struggling with motivation for the non-synchronous format you could treat the office hour time as a synchronous touch point with me and the rest of the course.

**Technology:** Students in this course will need a working and reliable computer and Internet access that will allow use of Canvas course site tools and any online resources provided. Access to PDF reader and a word processing software required.

**Course Technology support:** If you find that an assigned item is not available please send me an email and I will work to correct the problem. I don't have the knowledge of Canvas or other platforms to provide technical support. Requests for VT-specific technical support can be directed to 4Help by calling (540) 231-HELP (4357). Requests for help with the Canvas Learning Management System should be accessed by clicking the Help icon found in the far left navigation of any Canvas screen

**Course communication:**

We will use Canvas to post course announcements, assignment guidelines, etc. and will use Canvas and/or your Virginia Tech email account for class communication. This semester, we will rely heavily on Canvas Announcements for sending important reminders about class. Make sure you have your Canvas account set to receive announcements immediately! To check your settings, go to Canvas Account Notifications and then make sure "Announcements" is set to "notify me right away." In sum, check Canvas and your Virginia Tech email regularly. Note that I check my work email during regular business hours (8 a.m. -5 p.m., M-F).

**Required Text:** Epidemiologic Principles and Food Safety. Edited by Tamar Lasky. Oxford University Press. ISBN 978-0-19-517263-8

**Recommended Texts:**

Outbreak: Cases in Real-World Microbiology. Rodney Anderson. ASM Press. ISBN 978-1-55581-366-6.

Procedures to Investigate Waterborne Illness – 3<sup>rd</sup> Edition. International Association for Food Protection. [https://www.foodprotection.org/form\\_public.htm](https://www.foodprotection.org/form_public.htm)

Procedures to Investigate Foodborne Illness - 6th Edition. International Association for Food Protection. [https://www.foodprotection.org/form\\_public.htm](https://www.foodprotection.org/form_public.htm)

**Resources:**

- Doyle, M.P. and Beuchat, L.R. 2007. Food Microbiology: Fundamentals and Frontiers. 3<sup>rd</sup> edition.
- Microbiological Methods-  
<http://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm2006949.htm>
- British Medical Journal How to Read a Paper Series reading.  
(<http://www.bmj.com/cgi/content/full/315/7101/180>)
- Patients: a Randomized, Double-Blinded, Placebo-Controlled Clinical Trial, Journal of the National Cancer Institute. Vol 87. No. 17. September 6, 1995. pp.1307-1315.

**Evaluation:**

Assignment	Points
Exams (3) [100 each, lowest score dropped]	200
Cumulative Final Exam	100
Lecture content quizzes	100
Online case studies	100
Pre-Recorded online journal article presentation	65
Discussion board participation and engagement of journal articles	60

You may drop your lowest exam score. Your final grade will be out of 625 points.

**GRADING SCALE:**

Points	Letter Grade	Credits
625-581	A (93 and above)	4.0
580-562	A- (90-93)	3.7
561-543	B+ (87-90)	3.3
542-518	B (83-87)	3.0
517-500	B- (80-83)	2.7

499-481	C+ (77-80)	2.3
480-456	C (73-77)	2.0
455-437	C- (70-73)	1.7
436-418	D+ (67-70)	1.3
417-393	D (63-67)	1.0
392-375	D- (60-63)	0.7
0-376	F (0-60)	0.0

It is the University's policy to provide accommodations for students with religious observances conflicting with coursework, but it is the **student's responsibility** to inform their instructor **in advance** of intended religious observances.

**Exam Policy:** Due to the online nature the exams will be open lecture notes but time will be limited to 120 minutes. These will be short answer and essay questions. The exams will be available beginning at 7am on the Friday and close at 11:59Pm on Sunday of the week assigned. The grades may be curved. Sharing the questions or answers with others is considered a violation of the VT Honor code. Since the grades will be curved sharing with others could result in a negative effect to your own performance.

**No makeup exams** will be given for any exams, regardless of excused or unexcused absence. This will be your dropped exam. Students who know in advance that they will miss the exam will be allowed to take the exam **before** the rest of the class.

**Late work policy:** All quizzes, presentations and discussion board posts are expected to be turned in on time. For each day (M-F) an assignment is late, 10% will be deducted from the assignment grade. If an assignment is only late by a short time (1 hr) it will still have a 10% penalty. All modules and quizzes will open one week before the topic providing ample time for students to complete the material.

**HONOR CODE:** The standards of conduct set forth by the Virginia Tech Honor System and referred to as the "Honor Code" are to be followed at all times. All graded work is to be completed by the individual. This includes lab assignments where a group has collected data. All interpretation and responses to worksheet or lab reports must be the student's own work. Any suspected violations of the VT Honor Code will be promptly reported and resolved through the VT Honor System. The University's typical sanction for an honor code violation is a 0 for the course. For more information visit the following website: <http://www.honorsystem.vt.edu/>

VT Honor Pledge: "I have neither given nor received unauthorized assistance on this assignment."

NOTICE: Sharing of graded materials (exam and quizzes) is not allowed and will result in sanctions from the University's Honor System.

**SSD:** Virginia Tech welcomes students with disabilities into the University's educational programs. The University promotes efforts to provide equal access and a culture of inclusion without altering the essential elements of coursework. If you anticipate or experience academic barriers that may be due to disability, including but not limited to ADHD, chronic or temporary medical conditions, deaf or hard of hearing, learning disability, mental health, or vision impairment, please contact the Services for Students with Disabilities (SSD) office (540-231-3788, [ssd@vt.edu](mailto:ssd@vt.edu), or visit [www.ssd.vt.edu](http://www.ssd.vt.edu)). If you have an SSD accommodation letter, please meet with me privately during office hours as early in the semester as possible to deliver your letter and discuss your accommodations. Please note that SSD does not send these letters directly to instructors but considers this to be a student's responsibility. You must give me reasonable notice to implement your accommodations, which is generally 5 business days and 10 business days for final exams.

**Right to change information:**

Although every effort has been made to be complete and accurate, unforeseen circumstances arising during the semester could require the adjustment of any material given here. Consequently, given due notice to students, the instructor reserve the right to change any information on this syllabus or in other course materials.

### RECOMMENDED LECTURE SCHEDULE

(Subject to change with exception of exam dates)

This schedule assumes 2 75 minute sessions and 1 50 minute journal club/online presentation session

Month	Day	Topic	Required reading
August	24	Course overview, What is food safety? Digestion	Posted on Canvas
	26	Microbes of the GI tract, Dysbiosis, Antimicrobial resistance	Posted on Canvas
	31	Burden of Food-borne disease	Chapter 1, Canvas
September	2	Infectious agents- Bacteria	Chapter2
	7	Infectious agents- Bacteria/Viruses	
	9	Infectious agents- Viruses, parasites	
	14	Economics of foodborne disease	
	17-19	<b>Exam 1</b>	
	21	Food borne illness investigation basics	Canvas
	23	Identification and typing –I	Canvas
	28	Identification and typing-II	Canvas
	30	Identification and typing- III	Canvas
October	5	Surveillance:	Chapter 3, Canvas
	7	Vehicles and sources	Chapter 4
	12	Food as exposure	Chapter 5
	14-16	<b>Exam 2</b>	
	19	Epi Investigation I	
	21	<b>Case study</b>	Chap6, Canvas
	28	Epi Investigation II: study designs	Chapter 7
November	2	EPI Investigation III: design and data quality	Chapter 8
	4	<b>Case study</b>	
	9	Food production and processing I	Chap 10
	11	Food handling and preparation	Chap 11, Canvas
	16	<b>Case study</b>	
	18-21	<b>Exam 3</b>	
	22-27	Thanksgiving Break	
	30	Epi investigation: Traceback and on-site	Canvas
December	2	Risk assessment	Chapter 9
	7	Food laws	Chapter 13, Canvas

	10-12th	Final Exam	
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### **Journal club and scientific paper discussion schedule**

1 50 minute journal club/online presentation session

Presentations are due Monday 8am and discussion posts are due at 11:59PM the following Sunday

**\*\*Subject to change based on enrollment in course\*\***

August 25<sup>th</sup>- Finding scientific resources

September 1 Reading a scientific paper

September 8 Expectations for scientific paper presentations

September 15 Read Molecular Methods in Food Safety Microbiology: Interpretation and Implications of Nucleic Acid Detection <https://doi.org/10.1111/1541-4337.12072> (Links to an external site.).

September 22 TBD

September 29

October 6

October 13

October 20

October 27

November 3

November 10

November 17

December 1