I. Course Description

This course focuses on the ways in which host, agent and environmental interactions influence the transmission of infectious agents. Specific topics related to these microbes include: environmental dissemination, eradication and control, evolution of virulence, and use of analytical and molecular tools.

II. Course Prerequisites

None

III. Learning Objectives

To understand the ways in which host, agent and environmental interactions influence the transmission of infectious agents.

IV. Methods of Instruction and Work Expectations

A. Students will develop skills in scientific writing and will be required to write a short critical review paper.

B. Students will be able to identify key issues concerning infectious diseases and will develop the skills needed to give written and oral presentations about this material.

C. Following class lectures and discussions, students will be able to describe and discuss the following issues.

   1. Factors that affect transmission and environmental stability of specific infectious agents.

   2. The life cycle (agent, host, and environment interaction) of specific infectious agents (source(s) or reservoir(s) and host-range).

   3. Factors that influence the ability of a vaccine to work effectively.
4. Challenges of controlling and/or eradicating infectious diseases.

5. Ways in which laboratory methods, especially in molecular microbiology, are being used to improve our understanding of the ecology of infectious diseases.

6. Uses of analytical tools, such as Geographic Information Systems (GIS) for describing the distribution or predicting the spread of infectious diseases.

7. Effects of environmental disturbance and climate change on infectious disease transmission.

COURSE EXPECTATIONS:
The first class period will include faculty/student introduction, general introduction to the study of infectious diseases (including definitions and classifications), and informational resources.

Prior to each class meeting, all students are expected to familiarize themselves with the assigned topic using the suggested text(s) and appropriate references if necessary.

WRITTEN CRITICAL REVIEW OF A TOPIC IN INFECTIOUS DISEASE ECOLOGY (PAST, PRESENT OR FUTURE):
The goal of this assignment is to research a specific idea or event related to the ecology of infectious diseases. The review will include a clear thesis statement or hypothesis which will then be supported by a critical literature review. This exercise will improve your ability to research and write coherently on a scientific topic.

1. Each review should not exceed 15 typewritten double-spaced pages (not including references). Details concerning the assignment will be handed out during class.

2. The topic of the paper will be chosen before the midpoint of the course. The student will be expected to meet with the instructor to discuss the chosen topic.

3. An outline of the review paper will be required and will be graded. This assignment is intended to maintain the student's progress on the assignment.

4. The paper will be due by Wednesday, November 19. The outline will be due by October 16.

V. Evaluation and Grading
Grades will be based on the following:

30% - written in-class midterm examination
30% - written critical review paper
30% - written in-class final examination
10% - outline of proposed written critical review paper

The grading in this course will be non-competitive and grades will be assigned based on mastery of the material. Grades will be based on the standard 90,80,70,60 scale:

A -- 93-100 %
A- -- 90-92 %
B+ -- 87-89 %
B -- 83-86%
B- -- 80-82 %
C+ -- 77-79 %
C -- 73-77 %
C- -- 70-72 %
D+ -- 67-69 %
D -- 63-66 %
D- -- 60-62 %
F -- 0 - 60 % – Represents failure and signifies that the work was either (1) completed but at a level of
achievement that is not worthy of credit or (2) was not completed and there was no agreement between the
instructor and the student that the student would be awarded an I.

Please note the following:

- If applicable, students may change grading options during the initial registration period or during the first
two weeks of the term. **The grading option may not be changed after the second week of the term.**
- An incomplete grade is permitted only in cases of exceptional circumstances and following consultation
with the instructor. In such cases an "I" grade will require a specific written agreement between the
instructor and the student specifying the time and manner in which the student will complete the course
requirements. Extension for completion of the work will not exceed one year.

**VI. Scholastic Dishonesty and Plagiarism**

Students are responsible for knowing the University of Minnesota, Board of Regents' policy on student
conduct and scholastic dishonesty: [http://www.umn.edu/regents/policies/academic/StudentConduct.html](http://www.umn.edu/regents/policies/academic/StudentConduct.html).

Scholastic dishonesty as defined in the policy and will be reported to the Office of Student Judicial Affairs:
[http://www.sja.umn.edu/](http://www.sja.umn.edu/)

Plagiarism is an important element of this policy. It is defined as the presentation of another's writing or ideas
as your own. Serious, intentional plagiarism will result in a grade of "F" or "N" for the entire course. For more
information on this policy and for a helpful discussion of preventing plagiarism, please consult University
policies and procedures regarding academic integrity: [http://cisw.cla.umn.edu/plagiarism/uofmpolicies.html](http://cisw.cla.umn.edu/plagiarism/uofmpolicies.html).

Students are urged to be careful that they properly attribute and cite others' work in their own writing. For
guidelines for correctly citing sources, go to [http://tutorial.lib.umn.edu/](http://tutorial.lib.umn.edu/) and click on “Citing Sources”.

In addition, original work is expected in this course. It is unacceptable to hand in assignments for this course
for which you receive credit in another course unless by prior agreement with the instructor. Building on a
line of work begun in another course or leading to a thesis, dissertation, or final project is acceptable.

If you have any questions, consult the instructor.

**VII. Course Withdrawal**

School of Public Health students may withdraw from a course **through the second week** of the semester
without permission. No “W” will appear on the transcript. **After the second week,** students are required to do
the following:

- The student must contact and notify their advisor and course instructor informing them of the decision to
withdraw from the course.
- The student must send an e-mail to franc004@umn.edu in the SPH Student Services Center (SSC). The
email must provide the student name, ID#, course number, section number, semester, and year with
instructions to withdraw the student from the course, and acknowledgement that the instructor and
advisor have been contacted.
- The advisor and instructor must email the SSC acknowledging the student is canceling the course. All
parties must be notified of the student’s intent.
- The SSC will complete the process by withdrawing the student from the course after receiving all emails
(student, advisor, and instructor). A “W” will be placed and remain on the student transcript for the course.
- After discussion with their advisor and notification to the instructor, students may withdraw up until the
eighth week of the semester. There is no appeal process.
VIII. Course Text and Readings

Course Materials: Class notes and review articles will be provided, but students should expect to take notes during lectures and discussions. Material to augment the lectures will be placed on reserve in the Veterinary Library and in the Bio-Medical Library.

Recommended Text – There is no required text for the course. Strengths and weaknesses of various recommended texts will be discussed on the first day of class.

Possible Reference and Texts and Websites:


IX. Course Outline/Weekly Schedule

1  Introduction to course
   Overview of host - agent - environment interaction
   Global distributions of microbes
   September 4
2  Theory of disease transmission
   Direct transmission - Reed-Frost
   September 11
3  Direct transmission - Examples
   Vector-borne disease transmission
   September 18
4  Vector-borne disease transmission - Examples
   Sexually-transmitted diseases
   September 25
5  Sexually-transmitted diseases - Examples
   Molecular Tools in Infectious Diseases
   October 2
6  Food and Waterborne Diseases
   Vaccine theory - Models
   October 9
7  Vaccine theory - Examples
   Host specificity - Theory
   October 16
8  Midterm
   October 23
9  Host specificity - Examples
   Evolution of virulence - Theory
   October 30
10 Evolution of virulence - Examples
    Antimicrobial Resistance - Theory
    November 6
11 Antimicrobial Resistance - Examples
    Metagenomics and the structure of microbial populations
    November 13
12 No Class - Thanksgiving
    November 20
13 GIS and medical geography
   Wildlife and the disease ecosystem
   November 27
14 Disease Eradication
   December 4
15 Final
   December 18

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have a documented disability (e.g., physical, learning, psychiatric, vision, hearing, or systemic) that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities are encouraged to contact Disability Services to have a confidential discussion of their individual needs for accommodations. Disability Services is located in Suite 180 McNamara Alumni Center, 200 Oak Street. Staff can be reached by calling 612/626-1333 (voice or TTY).