

Valdosta State University
BIOL 3860 Emerging Infectious Diseases
Summer 2018

Instructor: Dr. Eric W. Chambers

Lecture hours: 8:00 – 10:35 am MTWRF, BSC Room 1024

Office Hours: 11:00 – 12:00 MW, BSC Room 2214

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Text:

(1) Emerging Infectious Diseases: A Guide to Diseases, Causative Agents, and Surveillance by Lisa A. Beltz, Jossey-Bass ISBN: 0470398035

(2) Primary literature dealing with emerging infectious diseases. These will be available to students through Blazeview.

Course Description: This course will explore the growing problem of emerging infectious diseases. Old foes of humanity such as malaria, influenza, tuberculosis, dengue and yellow fever are re-emerging with a vengeance while a host of new diseases such as AIDS, SARS, Ebola virus, Nipah virus, and others are emerging. The epidemiology of these diseases is highly complex and is linked to changes in animal and vector populations and the environment as well as socio-political and demographic changes worldwide. In this course we will seek to understand the biology of selected disease pathogens and how the aforementioned factors impact disease transmission. Current, as well as proposed, methods of control will be explored. The potential of these pathogens for use as agents of bioterrorism will also be discussed.

Course goals: The purpose of this course is to provide you with a broad introduction to infectious disease agents. Upon completion of this course you will be familiar with major global emerging infectious diseases. You will become familiar with the causative agents of each disease as well as with their associated vectors. The manifestation of disease symptoms will be addressed including the molecular basis of infection. You will be introduced to the symptoms associated with each disease and you will learn how the human immune system responds to infection. You will also become acquainted with the diagnosis, treatment, and prevention of the diseases covered in the course. You will learn the factors associated with transmission of these diseases and the important role of disease surveillance. Finally, you will be familiar with those agents that could be employed as agents of bioterrorism.

This course will serve as an excellent introductory course in infectious diseases for students who will be pursuing future graduate studies in Biology as well as for those who will be pursuing careers in medicine and public health.

Educational outcomes: Listed at the end of syllabus

Attendance: Attendance in lecture is mandatory and is part of the participation grade. The textbook is only a jumping-off point for the material we will cover in this course. The lectures will provide more detailed information and context to the subject. **You will have difficulty passing this course if you do not attend lecture.**

Lecture Conduct:

- Arrive on time.
- **Turn off/silence cell phones during class.**
- Don't talk during lecture **BUT** do ask questions
- Unless it's an emergency (and using your cell phone does not constitute an emergency) do not get up in the middle of lecture, leave and come back.
- **Do not leave class early** unless it's an emergency.
- During exams **NOBODY** can leave the exam and re-enter the exam room. If a student leaves, their exam will be graded as is; the student will not be allowed to finish the exam.

Dropping the course: The last day to drop the course is June 8, 2018

Withdrawing from the course: The last day to withdraw from the course (you will receive a W) is June 18, 2018. If you don't officially withdraw, and instead just stop coming to class, you will receive an F for the course.

Academic conduct: Cheating and plagiarism will not be tolerated and may result in a failing grade for the assignment, exam or the class. The Department of Biology has a plagiarism policy, which will be handed out during the first lab period.

Student identification: Students should have in their possession at all times their VSU student identification card. In order to verify the identification of students officially enrolled in the course, it is the instructor's prerogative to request official student photo identification cards at any time during lecture. During examinations, students will routinely be asked to display their VSU student identification cards visibly on the desktop and to make them available for inspection by their instructor and/or assistants.

Privacy Act (FERPA): The Family Educational Rights and Privacy Act (FERPA) prohibits the public posting of grades by social security number or in any manner personally identifiable to the individual student. No grades can be given over the telephone or over email because positive identification can't be made.

Students with disabilities: Students requiring special accommodations because of disability should discuss their needs with me as soon as possible. Those needing accommodations that are not registered with the Special Services Program must contact the Access Office for Students with Disabilities located in Farber Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

Procedure for exams:

- No books, electronic devices, or notebooks will be allowed during exams and students using such items will be asked to leave and will receive a zero for the exam.
- Cell phones must be turned off and they must be out of sight during the exam time
- Students will remove hats and hoods during exam.
- Students cannot wear headphones during the exam
- No talking will be allowed during the exam, but students are permitted to ask the instructor questions.
- Each student will be given an exam to be completed and handed back to the instructor.
- Students must bring a pencil and will take the exam during the stated lecture time only.

Grade Assessment: Your final grade will be based on your performance on participation, quizzes, lecture examinations and written assignments

1. Unit Exams (75%). There will be three unit exams. Each exam will cover the material for a specific unit and will consist of a variety of questions that may include matching, multiple choice, labeling, fill in the blank and short essay questions. Only students with a University related excuse may take an exam early. Your best policy: **DO NOT MISS EXAMS!**

2. Journal Article Critique (15%): You are required to write a 3-4 page critical analysis of a scientific paper. You will select a recent research study (published within the last three years) focusing on some biological aspect of an emerging disease pathogen. All paper topics will need to be approved by me. The paper will be double-spaced (12-point Times Roman font). Your goal is to help the reader understand the paper without having to read the original study. You will need to summarize the study in your paper but in addition you are to **analyze** and **evaluate** the study. In order to fully complete this assignment you should address the following questions in your critique:

- 1) **What was the purpose of this study?**
- 2) **What was known about the subject prior to the study (background)?**
- 3) **What questions did the researchers seek to answer?**
- 4) **What was the experimental design and methods? Were they novel or unique? Was the methodology appropriate for the study?**

- 5) What were the results of the study? Summarize all the key findings.
- 6) Do the results justify the author's conclusions? Do you agree with the conclusions that the authors reached?
- 7) What might be some follow-up experiments that the researchers could perform?

Spelling and grammar will count!! **There will be a 10% reduction in grade for each day the assignment is late.**

3. Homework, quizzes and in-class assignments (10%): This course will emphasize both lecture and discussion. Attendance is mandatory. You should be prepared to ask questions and contribute to discussions on material you are assigned to read. There may be in-class quizzes, one-minute papers, small group problem solving, etc.

It is necessary that you attend class each day in order to earn points for most of these assignments. Please contact me if you know you will need to miss a class during the term.

Grade Scale: For Biology majors, a grade of C or higher is required for this course.

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F < 60%

Summer 2018 TENTATIVE LECTURE SCHEDULE

| Topics | Chapters |
|---|--|
| Unit 1 – Introduction and Vectorborne Diseases | |
| Course Intro | Syllabus |
| Brief History of Infectious Disease | Chapter 1 |
| How Humans and pathogens interact | Chapter 2 |
| How humans and pathogens interact | Chapter 2 |
| Lyme Disease | Chapter 3 |
| Dengue and Yellow Fever virus | Chapter 15 |
| Malaria | Chapter 24 |
| Chagas Disease | Chapter 27 |
| EXAM #1 | TBA |
| UNIT 2 – Zoonotic Spillover and Pandemics | |
| Screening of the film <u>Contagion</u> | Location TBA |
| HIV and AIDS | Chapter 16 |
| Henipaviruses (Nipah and Hendra) | Breed et. al., paper |
| Monkeypox | Chapter 23 |
| Filoviruses (Ebola and Marburg) | Chapter 12 Alexander et al., paper Reed et al. paper |
| Epidemic and Pandemic Influenza | Chapter 19 |
| Hantavirus Pulmonary Syndrome | Chapter 20 |
| EXAM #2 | TBA |
| UNIT 3 – Rising Threats and Bioweapons | |
| West Nile, Chikungunya, and Zika viruses | Tsetsarkin et al., paper Grubaugh et al. paper |
| Monkey Pox | Chapter 23 |
| SARS and MERS | Chapter 21 |
| Bioterror Agents – Plague and Anthrax | Weiner and Glomski ; Liu et al. Butler; Hinnebusch et al. |
| EXAM #3 | June 28, 2018 |

VALDOSTA STATE UNIVERSITY GENERAL EDUCATIONAL OUTCOMES (GEO)

4. Students will express themselves clearly, logically and precisely in writing and in speaking, and they will demonstrate competence in reading and listening. They will display the ability to write coherently in standard English; to speak well; to read, to understand, and to interpret the content of written materials in various disciplines; and to listen effectively and to understand different modes of communication.

7. Students will demonstrate the ability to analyze, to evaluate, and to make inferences from oral, written and visual materials. They will be skilled in inquiry, logical reasoning, and critical analysis. They will be able to acquire and evaluate relevant information, analyze arguments, synthesize facts and information, and offer logical arguments leading to creative solutions to problems.

9. Students will demonstrate understanding of the physical universe and the nature of science, and they will use scientific methods and/or mathematical reasoning and concepts to solve problems.

DEPARTMENT OF BIOLOGY EDUCATIONAL OUTCOMES (BEO)

1. Develop and test hypotheses, collect and analyze data, and present the results and conclusions in both written and oral format used in peer-reviewed journals and at scientific meetings.

2. Describe the evolutionary process responsible for biological diversity, explain the phylogenetic relationships among the other taxa of life, and provide illustrative examples.

3. Demonstrate an understanding of the cellular basis of life.

4. Relate the structure and function of DNA/RNA to the development of form and function of the organism and to heredity

5. Interpret ecological data pertaining to the behavior of the individual organism in its natural environment; to the structure and function of populations, communities, and ecosystems; and to human impacts on these systems and the environment.