Valdosta State University

BIOL 4000/6000 Topics in Biology I:
Emerging Infectious Diseases
Summer 2014

Instructor: Dr. Eric W. Chambers
Lecture hours: 8:00 – 10:35 am MTWRF, BSC Room 1023
Office Hours: 1:00 – 2:00 MW, BSC Room 2214
Phone: 249-2736
E-mail: ewchambers@valdosta.edu

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 Masters level 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 13, 2014

Withdrawing from the course: The last day to withdraw from the course (you will receive a W) is June 20, 2014. 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.
- **NOTE:** You will have a portion of class time only to complete each lecture exam.

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

Unit Exams (60%). 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 answer. **There will be NO make-up exams.** Only students with a University related excuse may take an exam early. Your best policy: **DO NOT MISS EXAMS!**

Quizzes (10%) – There will be approximately 3 quizzes. These will primarily cover vocabulary and terminology. They will provide you an opportunity to gauge your understanding of the material within each unit.

Literature Critique (25%): There will be two (2) primary literature critique assignments. You will select two different research articles from the primary literature, locate the article, read the article, and then write a constructive critique about it. The research articles can focus on any aspect of emerging infectious diseases (genetics, immunology, cell biology, molecular biology, ecology, evolution, epidemiology, etc). The critiques should be 1.5- 2 pages (no longer than 2 pages), double-spaced and typed. The critique should contain the following elements:

1. What is the question or hypothesis being tested in the article
2. Why did the authors conduct this study? What is the importance of this work?
3. Do the Methods of the paper test the hypothesis. Is the design appropriate for the study or should it have been different?
4. Briefly state the conclusions and state if they are supported by the results.
5. Give an example of at least one follow up study that could be performed.
6. Did you think the study was interesting or boring? State why

I will provide a rubric and detailed format at a later date. Spelling and grammar will count!! **There will be a 10% reduction in grade for each day the assignment is late.**

Oral Report (Graduate Students only-10%). You will prepare and present a 15-minute Power point presentation on one of the papers you selected for your literature critique. You will be expected to discuss the background behind the study, the methods used, the results, and finally you will share with the class the reasons why this was an important study.

Participation (5%): This course will emphasize both lecture and discussion. Attendance is mandatory. You should be prepared to ask questions and discuss the material. In addition to attendance all students will be expected to monitor ongoing disease outbreaks using resources available on the internet (http://www.promedmail.org/; http://www.cdc.gov/mmwr/; etc) and share information about ongoing outbreaks (you will stand and make a 1-2 minute presentation).

You will lose participation points if you miss more than 2 lectures. 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 2014 TENTATIVE LECTURE SCHEDULE

Topics	Chapters
Unit 1 – Introduction and Bacterial Diseases	
Course Intro Brief History of Infectious Diseases	Beltz 1
How humans and pathogens interact	Beltz 2
Lyme Disease	Beltz 3
Anthrax	TBA
Plague	TBA
Tuberculosis	Beltz 10
Cholera	TBA
EXAM #1	**June 18**
UNIT 2 - VIRAL INFECTIONS	
Hemorrhagic Fevers	Beltz 12
Dengue Fever	Beltz 15
Arboviruses	Beltz 22
HIV and AIDS	Beltz 16
Epidemic and Pandemic Influenza	Beltz 19
SARS	Beltz 21
Small pox and Monkey pox	Beltz 23
EXAM #2	**June 26**
UNIT 3 - PARASITIC INFECTIONS AND BIOWEAPONS	
Malaria	Beltz 24
Lymphatic filariasis	TBA
American Trypanosomiasis	Beltz 27
African Trypanosomiasis	TBA
Leishmaniasis	TBA
Bioweapons	Beltz 30
EXAM #3	**July 3**

VALDOSTA STATE UNIVERSITY GENERAL EDUCATIONAL OUTCOMES (GEO)

1. Students will demonstrate understanding of the society of the United States and its ideals. They will possess the requisite knowledge of the society of the United States, its ideals, and its functions to enable them to become informed and responsible citizens. They will understand the connections between the individual and society and the roles of social institutions. They will understand the structure and operational principles of the United States government and economic system. They will understand United States history and both the historical and present role of the United States in the world.

2. Students will demonstrate cross-cultural perspectives and knowledge of other societies. They will possess sufficient knowledge of various aspects of another culture, including the language, social and religious customs, aesthetic expression, geography, and intellectual and political history, to enable them to interact with individuals within that society from an informed perspective. They will possess an international viewpoint that will allow them to examine critically the culture of their own nation and to participate in global society.

3. Students will use computer and information technology when appropriate. They will demonstrate knowledge of computer concepts and terminology. They will possess basic working knowledge of a computer operating system. They will be able to use at least two software tools, such as word processors, spreadsheets, database management systems, or statistical packages. They will be able to find information using computer searching tools.

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.

5. Students will demonstrate knowledge of scientific and mathematical principles and proficiency in laboratory practices. They will understand the basic concepts and principles underlying scientific methodology and be able to collect, analyze, and interpret data. They will learn a body of scientific knowledge and be able to judge the merits of arguments about scientific issues. They will be able to perform basic algebraic manipulations and to use fundamental algebraic concepts to solve word problems and equations. They will be able to use basic knowledge of statistics to interpret and to analyze data. They will be able to evaluate arguments based on quantitative data.

6. Students will demonstrate knowledge of diverse cultural heritages in the arts, the humanities, and the social sciences. They will develop understanding of the

relationships among the visual and performing arts, literature and languages, and history and the social sciences. Students will be versed in approaches appropriate to the study of those disciplines; they will identify and respond to a variety of aesthetic experiences and engage in critical thinking about diverse issues. They will be able to identify the components of and respond to aesthetic experiences in the visual and performing arts. They will develop knowledge of world literature within its historical and cultural frameworks. They will understand modem issues within a historical context and the role of the individual in various forms of societies and governments.

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.

8. Students will demonstrate knowledge of principles of ethics and their employment in the analysis and resolution of moral problems. They will recognize and understand issues in applied ethics. They will understand their own value systems in relation to other value systems. They will judge values and practices in a variety of disciplines.

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.