

Valdosta State University

BIOL 4000 Topics in Biology I: Emerging Infectious Diseases Summer 2013

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Lecture hours: MTWR 8:00 – 9:25 AM BSC 1202

Office Hours: TR 10:00-11:00 AM

Text:

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

(2) Agents of Bioterrorism: Pathogens & Their Weaponization by Geoffrey Zubay et al., Columbia University Press ISBN: 0231133472

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. You will be introduced to the symptoms associated with each disease and you will understand 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 those pursuing careers in medicine and public health as well as for those who will be continuing their study of biology in graduate school. This course would also be useful for students pursuing careers with law enforcement or intelligence agencies.

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 and lab.
- 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 Friday, June 7, by 1:30 PM.

Withdrawing from the course: The last day to withdraw from the course (you will receive a W) is Thursday **June 27, 2013** by 12:00 pm. 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.
- 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 the class time only to complete each lecture exam.

Grade Assessment: Your final grade will be based on your performance on lecture examinations and the laboratory.

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!**

Literature Critique (30%): 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.**

Participation (10%): This course will emphasize both lecture and discussion. It is critical that you complete the readings ahead of class. You should be prepared to ask questions and discuss the material. Begin listening to the news and other media (MSNBC, CNN, Fox News, NY Times, Time, etc.) for stories about infectious disease. We will discuss current events at the start of each class session.

You will lose participation points if you miss more than 3 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 2013 TENTATIVE LECTURE SCHEDULE

Session	Date	Topics	Chapters
1	June 5	Course Intro Brief History of Infectious Diseases	Beltz 1
2	June 6	How humans and pathogens interact	Beltz 2
UNIT 1 - BACTERIAL INFECTIONS			
3	June 10	Lyme Disease	Beltz 3
4	June 11	Tularemia	Zubay 4
5	June 12	Anthrax	Zubay 8
6	June 13	Plague	Zubay 10
7	June 17	Tuberculosis	Beltz 10
8	June 18	Cholera	Zubay 12
9	June 19	EXAM #1	
UNIT 2 - VIRAL INFECTIONS			
10	June 20	Marburg and Ebola Hemorrhagic Fevers	Beltz 12; Zubay 5
11	June 24	Dengue Fever and Dengue Hemorrhagic Fever	Beltz 15; Zubay 2
12	June 25	HIV and AIDS	16
13	June 26	HIV and AIDS	16
14	June 27*	Epidemic and Pandemic Influenza	Beltz 19; Zubay 6
15	July 1	Epidemic and Pandemic Influenza	Beltz 19; Zubay 6
16	July 2	SARS	Beltz 21; Zubay 9
17	July 3	West Nile virus and Chikungunya virus	Beltz 22
18	July 8	Small pox and Monkey pox	Beltz 23; Zubay 11
19	July 9	EXAM #2	
UNIT 3 - PARASITIC INFECTIONS AND BIOWEAPONS			
20	July 10	Malaria	Beltz 24
21	July 11	Malaria	Beltz 24
22	July 15	Lymphatic filariasis	TBA
23	July 16	Schistosomiasis	TBA
24	July 17	Chagas Disease	Beltz 27
25	July 18**	Leishmaniasis	TBA*
26	July 22	Control of Infectious Disease – The role of public health	TBA
27	July 23	Bioweapons – Introduction Personal defense	Zubay 1; Zubay Appendix 3
28	July 24	Bioweapons – vaccines and drugs	Zubay Appendix 2 and 3
29	July 25	EXAM #3	

* Literature Critique #1 Due

**Literature Critique #2 Due

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 modern 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.