Common Course Outline for: BIOL 1103 Introduction to Emerging Diseases

A. Course Description
   1. Number of credits: 4
   2. Lecture hours per week: 3
      Lab hours per week: Minimum of 3 hours of scheduled and/or self-directed lab work
   3. Prerequisites: Eligible for READ 1106
   4. Co-requisites: None
   5. MnTC Goals: 3 and 8

   A non-majors general education lab course that introduces the global, national and local factors that cause and influence the emergence and re-emergence of infectious disease. Topics include the scientific method, epidemiology, disease transmission, survey of microorganisms, bioterrorism, food and water safety and sexually transmitted diseases. Lab exercises mandate following biosafety practices for handling microbial pathogens. Lecture 3 hours per week. Lab requires a minimum of 3 hours per week of scheduled and self-directed lab work.

B. Date last revised: August 2017

C. Outline of Major Content Areas
   Lecture: Subtopics listed under each main topic may vary due to recent developments in the field and current events.
   1. Introduction to Emerging Diseases – Why Study?
   2. History of Emerging Diseases
   3. Emerging Diseases – Why Now?
   4. Disease Prevention
      a. Basic epidemiology
      b. Disease transmission
      c. Risk management – perception vs. real data
      d. Demographics and disease
      e. Governmental role in disease prevention
   5. Microbes and Infectious Disease
      a. Bacteria
      b. Viruses
      c. Prions
      d. Fungi
      e. Other Eukaryotes
   6. Methods of Controlling Disease
      a. Antimicrobial agents
      b. Other chemical methods
c. Physical methods
7. Immunology – The Body’s Defenses
   a. Non-specific defenses
   b. Specific defenses
   c. Immunization and vaccine safety
8. Food and Water Safety
9. Sexually Transmitted Diseases
10. Germ Warfare – Past, Present and Future
11. Further study of additional selected topics – determined by class

Laboratory: Students will actively participate in lab by engaging in studies related to:
1. Bacterial Morphology
2. Use of the Microscope
3. Aseptic Transfer
4. Staining of Bacterial Smears
5. Hand Washing and Normal Flora
6. Microbes and the Environment
7. Water Quality Testing – Most Probable Number
8. Normal Flora of the Throat
9. Antibiotic Sensitivity Testing
10. Epidemiology
11. Food Plate Counts
12. Identification of an Unknown Enteric Bacterium
13. Study of Select Molds and Yeasts
14. Study of Selected Parasitic Protozoa
15. White Blood Cell Differential Count
16. Urinalysis
17. Immunology

D. Course Learning Outcomes
Upon successful completion of the course, the student will be able to:
1. Define and demonstrate understanding of basic principles of microbiology. (3a)
2. Describe the interrelationship between emerging infectious diseases, the factors that allow disease to spread, and social, environmental and political forces. (3d, 8a, 8b)
3. Practice basic microbiological techniques, data gathering, evaluation of results, and identification of microbes in the natural world. (3a, 3b, 3c)
4. Collect, evaluate, and analyze data trends and use the data in predicting future events. (2b)
5. Examine commonly held ideas and compare them to scientific data. (2c, 2d, 3a)
6. Analyze current events and their role in emerging diseases including world, national, state and local concerns about emerging diseases. (3d, 8c, 8d)
7. Describe how the immune system works (and sometimes fails), including principles of immunization. (3a, 3d)
8. Recognize the role of natural selection on disease pathogenicity, antibiotic resistance, and genetic resistance to disease. (3a, 3d)
9. Recognize the role of disease and disease prevention in other parts of the world and when traveling. (8c)
10. Use multiple written and electronic resources to collect data on diseases and scientific studies and then evaluate the collected information for its credibility, reliability, and accuracy. (2a, 3c)

E. Methods for Assessing Student Learning
A variety of evaluation and assessments methods will be used including, but not limited to, the following:

1. Written examinations (may include some or all of the following formats: multiple choice, true-false, fill-in-the-blank, matching, short answer and critical thinking questions) over lectures, class discussions and reading assignments
2. Lecture assignments including reports, small group presentations, and presentations to class on a short topic
3. Quizzes
4. Case studies
5. Laboratory assignments and papers including unknown identification
6. Oral laboratory quizzes to show mastery of techniques
7. A final comprehensive exam

F. Special Information
The laboratory portion of the course is delivered in the Biology Learning Center (BLC). The BLC is an open lab and has its own set of operating policies and procedures. An instructor will include the most recent version of the Departmental and Biology Learning Center Policies in the course syllabus.

One or more labs require the use of Biosafety Level 2 standards.

Students are required to wear a lab coat while in the BLC and to tie hair securely back.

Several topics require independent research and possible field studies including sampling the student's microbial flora.

This course may not be taken for credit after earning a “C” or better in Biology 2204.