Semester at Sea, Course Syllabus
Colorado State University, Academic Sponsor

Voyage: Fall 2016
Discipline: International Education
Course Number and Title: IE 272 World Interdependence - Current Global Issues: Diseases without borders (Section 2)
Division: Lower
Faculty Name: Marc Zimmer
Semester Credit Hours: 3

Prerequisites: None

COURSE DESCRIPTION

Climate change, increased population density and geographic mobility are aiding disease outbreaks, such as Ebola, Dengue, Zika and the Flu. We will examine the contributing factors as well as the global and local impacts of these diseases with a particular focus on the countries we will visit. Applications of current knowledge, such as the release of genetically modified organisms, to combat the diseases will be discussed in the context of local cultures. Interdisciplinary (scientific, economic, political, religious) aspects of an epidemic will be explored with an emphasis on the complexities of world interdependence. Advances in modern biotechnology, the reach of electronic media and the recent climate change (COP21) and human gene editing summits will be used to drive much of the discussions.

LEARNING OBJECTIVES

- To develop a deeper understanding of diseases and their spread and an understanding of their world-wide significance.
- To gain an appreciation of the concept of world interdependence and the related complexities and relationships.
- To identify contributing factors and processes associated with diseases and the consequences of specific interventions, actions, and/or inactions.
- To critique current media coverage of diseases and their causes, and compare coverage with current scientific knowledge.
- To acquire an understanding of the interdisciplinary dimensions and impacts of a disease outbreak.

REQUIRED TEXTBOOKS

Recommended books

- Ian Goldin and Mike Mariathasan, The Butterfly Defect: How globalization creates systemic risks, and what to do about it, Princeton University Press, 2014
- Marc Zimmer, Illuminating Disease: An Introduction to Green Fluorescent Proteins, Oxford University Press, 2015 for the background on diseases.

All other required materials will be available from the class website. You will be asked to read portions of the journal articles referenced in the topical outline of the course given below.

TOPICAL OUTLINE OF COURSE

Depart Hamburg —September 10

A1—September 12: Introduction
The Global Future
Associated Viewing: Ian Goldin, (2009) TED talk, "Navigating our global future"

A2—September 14: Airborne pollution recognizes no borders.
Why are the highest concentrations of many pollutants found in the Artic?
Coal vs. Nuclear Energy

A3—September 17: Chernobyl and effects on Greece
Associated Reading: Kritidis, P., and Florou, H. (2001) Radiological impact in Greece of the Chernobyl accident - A 10-year retrospective synopsis, *Health Physics 80*, 440-446.

Athens—September 19-23

A4—September 24: Malaria: A Case study in world interdependence
Malaria I: History of Malaria – Malaria in ancient Rome
Associated Reading: Greenwalt, D. E., et al (2013) Hemoglobin-derived porphyrins preserved in a Middle Eocene blood-engorged mosquito, *Proceedings of the National Academy of Sciences 110*, 18496-18500.
Wilford, J.N. (2001) DNA shows malaria helped topple Rome, *The New York Times*, Feb 20

Civitavecchia: September 26-30

A5—October 1: **Malaria II:** Using pesticides to control malaria mosquitoes – DDT
DDT leads to the global environmental movement
DDT and the North/South divide

Barcelona—October 3-7

A6—October 8: **Malaria III:** Quinine and artemisinin two ancient herbal malarial remedies
Politics and economics of drug development
Spillover, where did human malaria originate

Associated Reading: Fu, J.-C. (2015) The secret Maoist Chinese operation that conquered malaria – and won a Nobel, *The Conversation*, Oct. 6
Holmes, E.C. (2010) The gorilla connection, *Nature*, 467, 404-405

Casablanca—October 10-14

A7—October 15: **Test**

A8—October 17: Introduction to epidemiology. Plague (video game)

A9—October 19: Ebola

Associated Reading: Ladner, J.T. et al (2015) Evolution and Spread of Ebola Virus in Liberia, 2014-2015 *Cell Hosts and Microbe*, 18, 659-669

Dakar—October 21-24

Field Class: Perspectives of Malaria Prevention and Treatment in Senegal

A10—October 25: Urbanization

A11—October 27: Dengue – Why is it the fastest spreading infectious disease in the world?

A12—October 30: Wolbachia vs Oxitec, Brazil, Key West and Hawaii

Salvador—November 1-6

A13—November 7: Urbanization continued
Zika - Brazil warns women not to get pregnant as zika virus is linked to rare birth defect

A14—November 9: Introduction to DNA, gene and gene technology

A15—November 11: CRISPR/Cas summit
What rules should we have for genetically editing humans?

Port of Spain—Nov. 13-14

A16—November 15: Globalization and Systemic Risks. The Butterfly Defect

A17—November 17: Introduction to climate change

A18—November 20: Test

Callao—November 22 - 26

A19—November 27: The "global" in global warming.
Attempts at regulation. Montreal Protocol vs. Paris COP 21
Associated Audio: McEvers, K. (2015) Rising Sea Levels Threaten Tiny Islands Home To Indigenous Panamanians, *NPR*, November 12.

A20—November 29: Climate change and diseases
Associated Reading: Bouzid, M. et al (2014) Climate change and the emergence of vector-borne diseases in Europe: case study of dengue fever *BMC Public Health* 14, 781-793
Campbell, L.P. et al (2015) Climate change influences on global distribution of dengue and chikungunya virus vectors *Philosophical Transactions B* 370
Caminade, C. et al (2014) Impact of climate change on global malaria distribution *PNAS* 111, 3286-3291.

Guayaquil—December 1-4

A21—December 5: Chagas Disease in Central America
Associated Reading: Hotez, P. J et al (2012) Chagas Disease: The New HIV/AIDS of the Americas, *PLOS Negl Trop Dis* 6, e1498.

A22—December 7: Influenza, 1918, bird flu, pandemics

Puntarenas—December 9-13

A23—December 14: HIV/AIDS, politics of science, antiretroviral distribution

A24—December 16: Diseases without borders. Final thoughts

No Classes—December 18

A25—December 19; A Day Finals

San Diego—December 22

FIELD WORK

Field Class attendance is mandatory for all students enrolled in this course. Do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field class. Field Classes constitute at least 20% of the contact hours for each course, and will be developed and led by the instructor.

The Field Class for this course, Perspectives of Malaria Prevention and Treatment in Senegal, will take place at the University of Cheikh Anta Diop (UCAD) in Dakar on October 21st. Part 1 of the Field will be a panel discussion with speakers: (1) Dr. Magatte Ndiaye, UCAD; (2) Dr. Amy Bei, Harvard School of Public Health; (3) Jenson Daniel, Peace Corps Marlaria Programs in Senegal; (4) Marissa Pledger, Peace Corps Volunteer in Senegal; (5) a malaria survivor. Part 2 will be the two Peace Corps Volunteers training the students on how to give a health workshop focused on malaria prevention and control, after which the students will conduct mock training of some English-speaking UCAD students. For lunch, Panel Members, UCAD students, and SAS students will share a traditional Senegalese lunch at a nearby restaurant and have time to discuss their respective countries and experiences.

Objectives for the field class:

1. Describe the biologic, behavioral, and sociocultural aspects of malaria prevention and treatment.
2. Describe Peace Corps activities in Senegal focused on malaria prevention and treatment.

Field Class and Independent Field Assignments

You will be required to write two short reactions/reflection papers. The papers should be ~600 words in length. The goals of these reflection papers are to encourage you to reflect upon experiences that you had during your field trips to the different ports and most importantly to integrate the material studied in class with the on-shore experiences in the countries visited.

Field Assignment I is due October 25th and it is a report on the field trip to the University of Cheikh Anta Diop (UCAD) in Dakar.

Field Assignment II is due December 10th and it's a report of your voyage to date. Think about how the countries you have visited are affected by the materials we have learnt in class to date.

The reports should also answer the following three questions; a) What did you learn on the trip? (A summary of knowledge and insight acquired); b) How did you learn it? (A detailed description of what was accomplished); c) Why is this important? (An informed discussion about how this experience fits into the context of the course and any other courses you are taking this semester).

The reports will be evaluated according to the criteria

40% of the report grade will be based on how disease and world interrelatedness are covered in the paper

40% content/integration

10% grammar, spelling etc.

10% style and readability

METHODS OF EVALUATION / GRADING SCALE

The following Grading Scale is utilized for student evaluation. Pass/Fail is not an option for Semester at Sea coursework.

Class tests	30%
Two integrated field trip reports	10%
Field Class	20%
Class participation, Home works	10%
Final exam	30%

Grades will be assigned according to:

(A+>97); (A > 92.5%); (A- > 90.0%); (B+ > 87.5%); (B > 82.5%); (B- > 80.0%)

(C+ > 78.5%); (C > 72.5%); (C- > 70.0%); (D+ > 67.5%); (D > 62.5%); (D- > 60%)

(F < 60%)

ATTENDANCE/ENGAGEMENT IN THE ACADEMIC PROGRAM

Attendance in all Semester at Sea classes is mandatory, but it is at the instructor's discretion to assign a grade to the participation and attendance requirement. Remember to include information concerning the evaluation of Field Assignments and the Field Classes, which must constitute at least 20% of the total grade in a course.

Students must do their best to inform me prior to any unanticipated absence and take the initiative to make up missed work in a timely fashion. I will make reasonable efforts to enable students to make up work which must be accomplished under my supervision (e.g., examinations).

LEARNING ACCOMMODATIONS

Semester at Sea provides academic accommodations for students with diagnosed learning disabilities, in accordance with ADA guidelines. Students who will need accommodations in a class, should contact ISE to discuss their individual needs. Any accommodation must be discussed in a timely manner prior to implementation. A memo from the student's home institution verifying the accommodations received on their home campus is required before any accommodation is provided on the ship. Students must submit this verification of accommodations pre-voyage as soon as possible, but no later than July 19, 2016 to academic@isevoyages.org.

STUDENT CONDUCT CODE

The foundation of a university is truth and knowledge, each of which relies in a fundamental manner upon academic integrity and is diminished significantly by academic misconduct. Academic integrity is conceptualized as doing and taking credit for one's own work. A pervasive attitude promoting academic integrity enhances the sense of community and adds value to the educational process. All within the University are affected by the cooperative commitment to academic integrity. All Semester at Sea courses adhere to this Academic Integrity Policy and Student Conduct Code.

Depending on the nature of the assignment or exam, the faculty member may require a written declaration of the following honor pledge: "I have not given, received, or used any unauthorized assistance on this exam/assignment."

ELECTRONIC COURSE MATERIALS

All course materials will be in the IE272 electronic course folder housed on the ship's intranet. (*1-10*)