

College of Public Health & Health Professions  
Department of Environmental and Global Health

**PHC 6512: Environmental Management of Vector Borne Diseases**

Fall Semester:

**INSTRUCTOR INFORMATION**

**Professor:** Bernard A. Okech, MS, PhD, MPH

**Office Hours** (Appointment only): EPI: Room 116: Thurs. 10.00–12.00pm

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**COURSE OVERVIEW AND PURPOSE**

Globally, vector borne diseases cause of millions of deaths especially among vulnerable groups like children and contribute to crippling chronic illnesses among adults particularly in developing countries. Mosquitoes contribute substantially to the transmission of several of these diseases including West Nile fever, Dengue Hemorrhagic Fever, Malaria, Chikungunya and others. As the threat of these vector borne diseases increase along with the growing concern about chemical insecticides that are harmful to the environment, the use for environmentally sound methods for controlling these disease vectors strongly advocated. As such, there is a strong need for expert public health personnel with the knowledge and management skills to execute environmentally safe methods for the control these vector borne diseases. This course provides an opportunity for students to increase their skill sets in vector borne disease management and to increase the number of public health professionals with the expertise needed by local, state and federal governments and other agencies involved in vector borne diseases around the world. This course is open to graduate students in MPH, MS, DVM, PhD programs and may be considered an essential training for practitioners of vector borne disease control programs.

According to the World Health Organization, environmental management for vector borne disease control is defined as the planning, organization, implementation and monitoring of activities that modify and/or manipulate environmental factors or their interaction with man with a view to preventing or minimizing insect vector propagation and reducing man-vector-pathogen contact. It entails either or both of the following: 1) environmental modification - permanent infrastructural changes of a capital-intensive nature, 2) environmental manipulation – recurrent actions aimed at achieving unfavorable conditions for vector breeding.

In this course we will go beyond the conventional areas of environmental management as defined above and include other environmentally sound vector borne disease control methods in use in our society today.

## **COURSE OBJECTIVES**

Upon successful completion of the course, students should be able to:

1. Describe the history and the evolution of environmental methods used to control disease vector mosquitoes
2. Identify the major environmental methods used for the control of vector-borne diseases
3. Describe the specifics of environmental management methods used to control vector-borne diseases important in Florida, the United States, and selected diseases of global significance.
4. Describe the public health significance of environmental management of vector-borne diseases
5. Advise on the application of environmental management for the control of specific vector-borne diseases.
6. Describe the concepts in the planning, design and implementation of environmental management for control of vector-borne infectious diseases
7. Describe an appropriate environmental management response to outbreak of a specific vector-borne disease
8. Apply fundamental course principles and concepts when critiquing a published research article, writing a report or a presentation on environmental management for disease vectors.

## **REQUIRED READING**

1. Vector- and Rodent-Borne Diseases in Europe and North America By Norman G. Gratz - Cambridge University Press
2. Medical and Veterinary Entomology, 2<sup>nd</sup> Edition, Gary Mullen and Lance Durden
3. Mosquitoes and Their Control, Second Edition, Norbert Becker, Dušan Petric', Marija Zgomba, Clive Boase, Christine Dahl, Mino Madon, Achim Kaiser, Springer
4. Journal articles circulated to students one week before class.

## **RECOMMENDED READING MATERIALS**

1. Pest and Vector Control, Cambridge University Press, H. F. van Emden and M. W. Service
2. The Mosquito Wars: A History of Mosquito Control in Florida (Florida History and Culture) by Gordon Patterson
3. Disease Prevention Through Vector Control (Paperback), by Madeleine C. Thomson
4. Ecology and Control of Vector-borne Diseases, Editors: Willem Takken Bart G.J. Knols.
5. Guidelines for Dengue Surveillance and Mosquito Control, Second Edition, WHO Pacific Regional Office, Education in Action Series, No 8, WHO Regional Office for the Western Pacific
6. Ecosystems and Human Well-being, By Millennium Ecosystem Assessment (Program Published by Island Press, 2005 ISBN 1559632704, 9781559632706

## **PRE-REQUISITES:**

There are no pre-requisites although it is recommended that students take the Public Health Biology course

## **COURSE EVALUATION AND GRADING**

The course will be conducted as formal lectures covering various aspects of vector borne disease control using environmentally friendly methods. Features making up for the course evaluation include class attendance and participation, review of research articles and review papers, individual case studies

presented as term report, student presentations and written exams. The instructor will introduce topics and concepts for each class and students will be required to participate in the instructor-led discussions.

**Class attendance and participation (10):** Participation is based on class attendance and engagement in daily discussions of topics, activities and projects.

**Review of research articles and papers (10):** Research articles and review papers will be given out one week before the class, students are expected to read the papers and discuss them the following week when the class meets. Students will get points based on their strong participation in critiquing the articles.

**Assignments (20):** Assignments will be given after every class meeting on a subject matter emanating from the class discussions of that day. The assignments will be turned in 7 days later. Assignments will be either written assignments or reading assignments. The reading assignments will be graded based on summary statements turned in the students

**Case Studies (10):** For individual case studies, each student will be assigned a vector borne disease and will be required to present in written format as a term paper a whole array of methods that is used presently in the control of vector borne diseases. Sometimes the students will select their own topics and required to present a summary and address all questions pertaining to the assigned or selected topic.

**Student presentation (15%).** Each student will present a PowerPoint presentation of their final project, which may be the case studies or an exhaustive review article of a methods used to control vector borne diseases . Students will complete an evaluation of all student presentations (except their own). Student presentation grades will be based on i) Background preparation for the project; ii) Presentation effectiveness; iii) Leading class discussion; iv) Peer critique of presentation.

**Written Exams (35%):** Written exams are required for the course. There will be a midterm exam and a final exam that together will account for 35 percent of the final grade.

Component	Percentage of final grade
Class attendance/participation	10
Review of research articles/papers	10
Assignments	20
Case studies	10
Final project/presentation	15
Written Exams (Midterm and Final)	35

## GRADING SCALE: POINTS

***The grading scale for this course consists of the standard scale, including minus grades, below. The conversion factors for grade point values that are assigned to each grade are also included (in parentheses):***

93%–100% = A (4.00)	83%–86% = B (3.00)	73%–76% = C (2.00)	63%–66% = D (1.00)
90%–92% = A- (3.67)	80%–82% = B- (2.67)	70%–72% = C- (1.67)	60%–62% = D- (0.67)
87%–89% = B+ (3.33)	77%–79% = C+ (2.33)	67%–69% = D+ (1.33)	Below 60% = E (0.00)

## OUTLINE OF TOPICS

1. Introduction to the course
2. Major vector-borne diseases in the world

3. History of vector-borne disease management
4. Environmental basis for the management strategies for vectors of diseases
5. Chemical strategies the control of vectors of diseases
6. Biological control of vectors of diseases
7. Water management for the control of vectors of diseases
8. Mid-term Exam
9. Genetic strategies for the control of vectors of diseases
10. Physical, Social and Behavioral change for control of vectors of diseases
11. Evaluation of vector-borne disease control
12. Presentations
13. Presentations
14. Final Exam

### **UNIVERSITY'S HONESTY POLICY (CHEATING AND USE OF COPYRIGHTED MATERIALS)**

**Academic Integrity** – Students are expected to act in accordance with the University of Florida policy on academic integrity (see this web site for more details:

<http://www.dso.ufl.edu/studentguide/studentconductcode.php>

Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

*We, the members of the University of Florida community,  
pledge to hold ourselves and our peers to the  
highest standards of honesty and integrity.*

**Policy Related to Class Attendance:** All students signed up for the class must attend all the classes. Marks will be awarded for attendance. If you have to skip a class, I will need 7 day notice and justifiable reasons for not being able to attend. In cases that are acceptable, you will lose 20% of class attendance marks

#### **Policy Related to Make-up Exams or Other Work**

I expect that you will attend and be prepared to participate in all class sessions. Personal issues with respect to class attendance or fulfillment of course requirements will be handled on an individual basis. For cases, where student misses exam with permission they will be given a make up exam. There are no exceptions to this rule.

#### **Statement Related to Accommodations for Students with Disabilities**

##### **Accommodations for Students with Disabilities**

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

## **Counseling and Student Health**

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171. Visit their web sites for more information: <http://www.counsel.ufl.edu/> or <http://www.health.ufl.edu/shcc/smhs/index.htm#urgent>

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: [www.health.ufl.edu/shcc](http://www.health.ufl.edu/shcc)

Crisis intervention is always available 24/7 from:  
Alachua County Crisis Center: (352) 264-6789.

*BUT – Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.*

## **Suggested Additional Information (not required)**

Explore websites on the internet. There is a lot of useful information to supplement class work:

1. <http://www.mosquito.org/#>
2. <http://www.who.int/apoc/vector/en/>

## **Class Demeanor Expected of the students by the Instructor (lateness to class, cell phones etc)**

Remember the early bird catches the worm. NO cell phone use in class. Although students may bring a laptop to class, surfing the internet during class discussions will NOT be allowed. All students are expected to be cordial and respectful to each other

## **Final Note**

This course syllabus will be posted to a student accessible website and will be available at the departmental office.