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ENVH-9133-A - Vector-borne Zoonotic Diseases: Epidemiology and Control.

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Georgia Southern University
Jiann-Ping Hsu College of Public Health

ENVH-9133-A - Vector-borne Zoonotic Diseases: Epidemiology and Control.
Spring 2018

<u>Instructor:</u>	Marina E. Ereemeeva, M.D., Ph.D., Sc.D.
<u>Office:</u>	Hendricks Hall, Room 2015
<u>Phone:</u>	912-478-0504
<u>E-Mail Address:</u>	meremeeva@georgiasouthern.edu (expect responses within 24 hr; no response after 6 pm on Friday and on weekends)
<u>Office Hours:</u>	Monday 2:00 pm – 5:00 pm Wednesday 2:00 pm – 4:00 pm Any other time by appointment
<u>Web Page:</u>	http://jphcoph.georgiasouthern.edu/
<u>Class Meets:</u>	Wednesday 5:00 pm – 7:45 pm Info Technology Building, room 3216

Course schedules can be found at: <http://students.georgiasouthern.edu/registrar>

Prerequisites: A minimum grade of "C" in PUBH 6541 and PUBH 8133.

Catalog Course Description:

This course introduces students to important vector-borne and zoonotic diseases, including endemic and emerging zoonoses of historic and contemporary importance in the USA and from a global perspective. It provides an overview of the epidemiology of major vector-borne diseases, the biology of their vectors and animal reservoir and their interaction with pathogens. It discusses the dynamics and principles of pathogen transmission, examines current approaches to vector and disease surveillance, and summarizes the public health challenges associated with control and prevention of these diseases and proper use of pesticides and other environmentally safe methods.

Recommended and Supplemental Texts:

1. Gratz, N. 2006. Vector- and Rodent-borne Diseases in Europe and North America: their distribution and public health burden. Cambridge University Press, Inc. ISBN-13: 978-0-521-85447-4. (Main text book).
2. Vector-Borne Diseases Understanding the Environmental, Human Health, and Ecological Connections: Workshop Summary. 2008. The National Academy Press. PDF is available at <http://nap.edu/11950>. (Supplementary text).
3. Global Health Impacts of Vector-Borne Diseases: Workshop Summary. 2016. The National Academy Press. PDF is available at <http://nap.edu/21792>. (Supplementary text).

DrPH Core Student Learning Outcomes:

1. Demonstrate the readiness to work with communities to address public health problems.
2. Select and apply theoretically based interventions to address public health problems.
3. Apply appropriate research methods to address community health problems, particularly among rural and underserved populations.

DrPH Epidemiology Student Learning Outcomes:

1. Construct a public health and epidemiological research question from ideas, conditions, and events that exist in a rural and urban community, region, state, and nation using critical thinking skills.
2. Demonstrate required skills for translating public health practice objectives to the appropriate epidemiological framework for analysis and interpretation of results.
3. Select appropriate statistical tools, methodological alternatives and graphical descriptives to analyze and summarize public health and epidemiological data.
4. Formulate population-based hypotheses and develop appropriate research designs to test these hypotheses.
5. Communicate epidemiological principles and concepts to lay and professional audiences through both oral and written communication.

DrPH Core Competencies in Epidemiology

Upon graduation, a student with an DrPH degree in Epidemiology should be able to:

1. Design a public health and epidemiological investigation in terms of experimental design, data to be collected that reflect the research objectives, and specification of appropriate methods of analysis.
2. Analyze public health and epidemiological data using appropriate statistical software such as SAS and R.
3. Develop new epidemiological methods and new ideas for applying existing epidemiological methods to applications in public health and the epidemiological sciences.
4. Develop written and oral reports to communicate effectively with research investigators the pivotal aspects of a study, including: design, study objectives, data analysis methodology, results, and conclusions.
5. Create a collaborative environment for working on written and oral reports.
6. Employ basic ethical and legal principles pertaining to the collection, maintenance, use and dissemination of epidemiological measures.

Performance-Based Objectives Linked to Course Activities (Activities are described in the Section below):

The number in parenthesis corresponds to the competency number from the list above. *After completing this course the student will be able to:*

- (1) Define concepts for vector-borne diseases and use specific examples to describe different types and unique features of vector-borne disease transmission and their ecological components (Activity 1 & 2 & 3).
- (2) Identify and describe recently emergent arthropod-borne infectious diseases and define factors responsible for their spread (Activity 1 & 2 & 3).
- (3) Analyze morbidity and mortality of the most prevalent vector-borne diseases, their temporal and spatial distribution and what populations are affected (Activity 1 & 2 & 3).
- (4) Identify environmental, biological and genetic drivers of transmission, and how these are impacted by the social, political and economic climate (Activity 1 & 2 & 3).
- (5) Describe and evaluate approaches used to control vector-borne diseases (Activity 1 & 2 & 3).
- (6) Explain conditions and mechanisms underlying the occurrence and evolution of pesticide resistance in arthropods and the pathogens they vector, and integrated strategies to prevent and manage the development of resistance (Activity 1 & 2 & 3).

Assessment of Student Learning:

Activity 1: Use course lectures and class discussions to explain the basic terminology and definitions of vector-borne diseases and their pathogens, ecological cycles and individual etiological entities including recently emergent vector-borne pathogens. Competence in basic knowledge will be evaluated using several assessment methods: (1) two exams, (2) critical analysis of a peer-reviewed publication, and (3) mini-review final paper for individual case-studies.

Activity 2 : Use course lectures, class discussions, and case studies to explain the basic principles and integrated approaches for control of vector-borne diseases. Competence in ability to understand, analyze and apply the concepts and principles of the integrated vector control process will be evaluated using the following activities: (1) two exams, (2) presentation and discussion of special topics, (3) critical analysis of a peer-reviewed publication, and (4) mini-review final paper for individual case-studies.

Activity 3: Use MMWR data and peer-reviewed case-studies to explain and to analyze morbidity and mortality of most prevalent vector-borne diseases, their temporal and spatial distribution and what populations are affected. Competence in ability to analyze and interpret data will be assessed using following activities: (1) designated questions included in both the midterm and final exams, (2) case-studies and calculations performed as a part of the short papers analyzing relevant topics, (3) group discussions and (4) student presentations.

Overview of the content to be covered during the semester

Week/Date	Topic	Readings	Assignment*
1 01/10/2018	Course introduction and outline; VBD in human history and public health	Chapters 2 & 20 Gratz	Acquire a textbook and read recommended sections; complete plagiarism training after the class
2 01/17/2018	Arboviruses and mosquito-borne arboviral infections	Chapters 3, 4 and 21 Gratz	Assignment 1: Reading and presentation of an assigned article on emerging arboviruses
3 01/24/2018	Malaria	Chapters 5 and 22 Gratz	Assignment 2: Reading and presentation of an assigned article on emerging issues in malaria epidemiology
4 01/31/2018	Sandfly-borne diseases	Chapter 7 and 24 Gratz	Assignment 3: Reading and presentation of an assigned article on emerging issues in leishmaniasis, phleboviruses or <i>B. bacilliformis</i> .
5 02/07/2018	Flea-borne diseases	Chapter 10 and 27 Gratz	Assignment 4: Reading and presentation of an assigned article on emerging issues in plague ecology and epidemiology.
6 02/14/2018	Pediculosis and Louse-borne diseases	Chapter 11 and 28 Gratz	Assignment 5: Prepare a mini-literature review on human pediculosis in a selected geographic region.
7 02/21/2018	Tick-borne viral diseases. Spirochete diseases.	Chapters 12 and 30 Gratz	Time to review the course materials in preparation for MIDTERM EXAM
8 02/28/2018	MIDTERM EXAM	Review materials presented and discussed during weeks 1 through 6.	Be ready to take a midterm exam.
9 03/07/2018	Exam review. Tick-borne bacterial and parasitic diseases.	Chapters 12 and 30 Gratz	Class exercise: review of MMWR and National surveillance data on tick-borne diseases
10 03/14/2018	SPRING BREAK	NO CLASSES	
11 03/21/2018	Mites, cockroaches, biting midges & flies.	Chapters 8,9,13,14, 25,26,31,32 - Gratz	Discussion: Rickettsialpox and anthrax
12 03/28/2018	Kissing bugs and associated diseases	Chapter 29 Gratz	Discussion: Chagas Disease and vulnerable populations.
13 04/04/2018	Ecological & economic implications of VBD	Supplemental assigned reading; chapter 19 & 35 Gratz	Abstract of the final presentation is due
14 04/11/2018	Environmental & societal factors influencing transmission of VBD	Supplemental assigned reading	Round-table discussion
15 04/18/2018	Integrated strategies to control and prevent VBD	Supplemental assigned reading	First draft of the final presentation is due
16 04/25/2018	The intersection of human and animal health; vaccines and genetic control	Supplemental assigned reading	Final presentations Final paper is due by the end of this week
17 05/02/2018	FINAL EXAM	Review materials presented and discussed during this course.	Be ready to take the final exam.

**Samples of your work may be reproduced for marketing and recruitment purposes and/or inclusion in the professor's teaching portfolio. You have the right to review anything selected for use, and request for its removal.*

Course Structure and Instructional Methods: The course is divided into Weekly Learning Modules. Each learning module covers a particular topic of the class and is associated with a chapter(s) in the text book(s). Each module posted in Folio will include course notes, assignment instructions, and reading and supplemental materials related to the topic of the module. The lecture notes and supplementary materials will be posted after each class. Unless otherwise instructed, all graded assignments are due on Saturday, 10 pm. Late submissions will NOT be graded; under exceptional circumstances an extension may be granted by the instructor, however such requests must be submitted prior to the deadline. Graded assignments and comments will be posted in Folio by 5 pm on Thursday of the following week. It is the student's responsibility to read and understand all the course materials and complete on time the written homework and other required assignments, and pass all exams in order to successfully complete the course. It is expected that each students will spend a minimum of two hours studying and/or preparing for course requirements for each class (for each hour spent in class). Student is expected to come prepared for each class by reading and reviewing the assigned materials before that class session.

Course Credit: 3 credit hours.

To complete requirements for this course each student must participate in the following activities and exercises:

Class attendance and participation is a part of the course grade (10%). Participation is based on weekly class attendance and engagement in daily discussions of topics, activities and projects.

Critical analysis of a peer-reviewed article (10%):

Select a published peer-reviewed article relevant to the topics discussed in this course. This article should be focused on original laboratory or field-based studies of vector-borne diseases, with special emphasis on vectors or populations affected. Articles describing the pathogens or diseases are not suitable nor are articles published in the categories of reviews, editorials, opinions or letters to the Editors are suitable for this assignment. The article must be published since the beginning of 2016 and must be approved by the instructor. Journals such as Emerging Infectious Diseases, American Journal of Tropical Medicine and Hygiene, Journal of Medical Entomology, PLOS Neglected Tropical Diseases and Parasites & Vectors are suitable sources for your search. Review the article and write a 1,000-1,500-word critique summarizing the main points of the paper and discuss the relevance of the findings to the concepts of vector-borne diseases and associated issues discussed in the course. Your statements and arguments should be supported by at least 5 external references from the published literature; citation of website links for this assignment is not suitable. Submitted summary should be double-spaced, typed using font 11 Arial and standard 1 inch margins; titled, and labeled with the student's name appearing in a header or footnote on each page. Due date is identified in Folio.

Homework Assignments (9%):

Written homework or reading assignments will be given over the course of the semester based on the subject matter of the class discussions. There will be 7 days to complete the assignment. Written assignments will be graded based on the content of the essays and synthesis of the information included (no direct copying from literature permitted). Understanding of the reading assignments will be graded based on summary statements submitted by the students.

Classroom Activities (6%):

Students will participate in several classroom activities focused on review and analysis of data bases dealing with reporting and surveillance of vector-borne diseases. Grading will be done based on the summary reports submitted by the student at the end of the class.

Course Project (Individual Case-study) (15%):

Each student will select or be assigned a vector-borne disease and will be required to conduct an in depth literature search and summarize his/her findings in a thorough systematic review addressing contemporary methods and emerging issues associated with the control of vector-borne diseases, and identifying gaps or inconsistencies in the existing body of knowledge and applied practices.

Final Project Presentation (15%):

Each student will present a summary or a specific fragment of his/her final project in a PowerPoint presentation. Peer-review will be completed for all student presentations. The grade for this activity will be based on (1) Preparedness and completeness of the report; (2) Content and effectiveness of the presentation; (3) Engagement of class in Q&A discussion; and (4) Objective peer critiques of the presentation.

Midterm and Final Exams (35%):

Two written exams will be administered during the course of the semester. The final comprehensive exam will cover the materials presented in the whole course.

Grading: Weighting of assignments for purposes of grading will be as outlined below.

Assignment Description	Learning Objectives	Points	Weight
Class attendance and participation	1-6	50	10%
Homework Assignments (3 total)	1-6	45	9%
Classroom Activities (3 total)	1-6	30	6%
Critical Analysis of a Peer-reviewed Article	1-6	50	10%
PowerPoint Presentation of the Final Case-study project	1-6	75	15%
Mid Term Exam	1-4	75	15%
Final Case-study Summary Paper	1-6	75	15%
Final Exam	1-6	100	20%
Total Points		500	100%

The following point scale will be utilized in grading:

- A:** 450-to-500 points (90%-100%)
- B:** 400-to-449 points (80%-89%)
- C:** 350-to-399 points (70%-79%)
- D:** 300-to-349 points (60%-69%)

A cumulative total of 299 points or less will be considered as failing.

The grade from all assignments, exercises and exams as listed above will be included for calculating your final grade. Points will not be rounded up to increase a grade; grading on a curve will not be used in this class.

Your grades will be posted in the grade book, they will be also available to you via Folio. All exams and assignments will be graded and returned promptly so that students may accurately calculate their grades at any point in time during the semester.

Any assignments submitted AFTER the due date AND due time, will NOT be graded. When extraordinary circumstances occur (e.g., serious illness, death in the family, etc.), and/or if you need additional time to satisfactorily complete any course requirement, please, consult with the instructor within a reasonable amount of time via e-mail.

Nota Bene: Extensions are not guaranteed and will be granted solely at the discretion of the instructor. Adequate documentation may be required to grant a deadline extension.

EXTRA CREDIT

No individual extra credit is allowed or will be given in this course. Graduate students are expected to utilize best effort on all assignments, graded examinations, and intellectual challenges (papers, discussions, presentations) and so forth.

CLASS ETIQUETTE:

Turn off ring tones of your cell phones during the classes, discussions, and presentation meetings. Unless internet access is required for class activity, laptops, iPads and similar devices are not to be used during the class sessions. Class will start and end on time, inform the instructor in advance if you will be late or absent, or if you must leave early. You can bring a bottle of water or soda, however, eating in class is not allowed. The class will have one 10 min break.

Tardy/Late Policy

It is expected the students to be present when class starts. The class always starts on time so you need to be in your seat & ready to go by 5:00 pm. Be professional, late arrivals (first 10 minutes of class or less) will not be permitted for more than two times during the semester. Late arrival for field or lab exercises will not be permitted and student will not receive credits for missing session.

Communications

If you have any questions related to the course, professional development or research opportunities, please send me an e-mail from your Georgia Southern e-mail account. Be sure that you sign your e-mail, and address it properly; do not use acronyms and text message abbreviations. If you ask me a direct question via e-mail, I will generally reply within 24 hours; weekends and holidays may take longer.

Office Hours

I will be happy to meet with and discuss any questions related to the course, professional development or research opportunities. Please talk to me before or after the class, come and see me during my office hours or make a special appointment so you have an undivided attention. If there is a special topic to discuss, you may want to send a heads-up e-mail so I am prepared to see you and have a better answer for your inquiry. Please, be advised that I am open to discuss any problems and difficulties related to your homework assignments and help you to complete the assignments on Monday through Thursday; no help or consultation related to the homework assignments will be available on Fridays.

UNIVERSITY POLICIES

Academic Integrity

The instructor believes that the conduct of a student registered or taking courses in the JPHCOPH should be consistent with that of a professional person. Courtesy, honesty, and respect should be shown by students toward faculty members, guest lecturers, administrative support staff, and fellow students. Similarly, students should expect faculty to treat them fairly, showing respect for

their ideas and opinions and striving to help them achieve maximum benefits from their experience in the JPHCOPH.

As a student registered at this University, it is expected that you will adhere to the strictest standards of conduct outlined in the *GSU Student Conduct Code* and the *Undergraduate & Graduate Catalog*. It is recommended that you review these documents to familiarize yourself with the University's policies. Your continued enrollment in this course is an implied contract between you and the instructor. Academic integrity relates to the appropriate use of intellectual property. The syllabus and all materials presented and/or distributed during this course are protected by copyright law. You are authorized to take notes, but that authorization extends only to making one set of notes for personal (and no other) use. Students are not authorized to sell, license, commercially publish, distribute, transmit, display, or record notes in or from class without written permission of the instructor.

Intellectual Property

In accordance with the Georgia Board of Regents, Georgia Southern University has adopted a specific set of policies regarding intellectual property created by students and faculty during their time at Georgia Southern University. This document can be found at:

<http://welcome.georgiasouthern.edu/president/intpropol.htm>

Plagiarism:

According to the Academic Dishonesty Policy of GSU, Plagiarism includes (but is not limited to):

- A. *Directly quoting the words of others without using quotation marks or indented format to identify them.*
- B. *Using published or unpublished sources of information without identifying them.*
- C. *Paraphrasing material or ideas without identifying the source.*
- D. *Unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic material.*
- E. *Self plagiarism – recycling your own work from other classes or other assignments.*

Students who plagiarize will be reported and receive a grade of "0" on the assignment. Plagiarism can also result in course failure and university dismissal. In cases of suspected or accusation of plagiarism by a JPHCOPH official, the following policy, as per the Judicial Affairs website (<http://students.georgiasouthern.edu/judicial/faculty.htm>) will be enforced:

PROCEDURES FOR ADJUDICATING ACADEMIC DISHONESTY CASES

First Offense - In Violation Plea

1. If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is a first violation of academic dishonesty. The incident will be reported via the following website: <http://students.georgiasouthern.edu/judicial/faculty.htm>

2. If it is a first violation, the professor should talk with the student about the violation. **If the student accepts responsibility in writing and the professor decides to adjudicate the case, the following procedures will be followed:**

- a. The student will be placed on disciplinary probation for a minimum of one semester by the Office of Judicial Affairs.
- b. The student will be subject to any academic sanctions imposed by the professor (from receiving a 0 on the assignment to receiving a failing grade in the class).
- c. A copy of all the material involved in the case (Academic Dishonesty Report Form and the Request for Instructor to Adjudicate Form) and a brief statement from the professor concerning the facts of the case and the course syllabus should be mailed to the Office of Judicial Affairs for inclusion in the student's discipline record.

First Offense - Not in Violation Plea (student does not admit the violation)

If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, the professor should contact the Office of Judicial Affairs to determine if this is the first or second violation of academic dishonesty. The student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case. If the student is found responsible, the following penalty will normally be imposed:

- a. The student will be placed on Disciplinary Probation for a minimum of one semester by the Office of Judicial Affairs.
- b. The student will be subject to any academic sanctions imposed by the professor.

Second Violation of Academic Dishonesty

If the professor and the Dean of Students agree that the evidence is sufficient to warrant a charge of academic dishonesty, and if it is determined this is the second violation, the student will be charged with academic dishonesty and the University Judicial Board or a University Hearing Officer would hear the case.

If the student is found responsible, the following penalty will normally be imposed:

- a. Suspension for a minimum of one semester or expulsion.
- b. The student will be subject to any academic sanctions imposed by the professor.

NOT RESPONSIBLE FINDING

When a student is found not responsible of academic dishonesty, the work in question (assignment, paper, test, etc.) would be forwarded to the Department Chair. It is the responsibility of the Department Chair to ensure that the work is evaluated by a faculty member other than the individual who brought the charge and, if necessary, submit a final grade to the Registrar. For the protection of the faculty member and the student, the work in question should not be referred back to the faculty member who charged the student with academic dishonesty.

In the case of a Department Chair bringing charges against a student, an administrator at the Dean's level will ensure that the student's work is evaluated in an appropriate manner.

CONFIDENTIALITY

In accordance with provisions of the Family Educational Rights and Privacy Act of 1974 and the Georgia Open Records Act, any information related to a violation of academic dishonesty or the outcome of a judicial hearing regarding academic dishonesty, is prohibited and must be treated as confidential by members of the faculty.

Academic Handbook: Students are expected to abide by the Academic Handbook, located at <http://students.georgiasouthern.edu/sta/guide/>. Your failure to comply with any part of this Handbook may be a violation and thus, you may receive an F in the course and/or be referred for disciplinary action.

University Calendar for the Semester:

The University Calendar is located with the semester schedule, and can be found at <http://www.collegesource.org/displayinfo/catalink.asp>.

Attendance Policy:

Attendance the first day of class is **mandatory** per University policy. Federal regulations require attendance be verified prior to distribution of financial aid allotments. Attendance will not be recorded after this initial period. Please, inform the instructor about all anticipated absences due to the illness (doctor verification is required for the second and third medical absence), work or personal reasons, late arrivals or needs to leave the class early.

Accommodations:

Georgia Southern University is an Equal Opportunity and Affirmative Action institution committed to providing reasonable accommodations for any person with a disability who meets the definition of disabled as described in the Americans with Disabilities Act. Students requiring academic accommodation should contact the Director of the Student Disability Resource Center for assistance at 912-871-1566 or TDD: 912-478-0666. Students requiring academic accommodation should also *notify the instructor no later than the third class meeting* in the semester. Notify the instructor if you not able to participate in field or laboratory exercises so an alternative activity can be suggested.

Disclaimer:

The contents of this syllabus are as complete and accurate as possible. The instructor reserves the right to make any changes necessary to the syllabus and course material to adjust for changing conditions and student needs including special guest lectures, current environmental events, and late breaking research. The instructor will make every effort to inform students of changes as they occur. Updates will be emailed to each student. It is the responsibility of the student to know what changes have been made in order to successfully complete the requirements of the course. You are responsible for any material covered or distributed online, including any announcements, so please check the course website in Folio **regularly**.

Tacit Approval

Review this document carefully and ensure that you understand the course policies, procedures, tentative course structure, and grading schema. Remaining in the course implies tacit agreement to the policies and procedures detailed in this syllabus.