

University of Florida
College of Public Health & Health Professions Syllabus
PHC 6326 Environmental and One Health (3 credit hours)
Summer 2022

Delivery Format: Online (Asynchronous)
E-Learning Website (<https://ufl.instructure.com/courses/455923>)

Instructor Name: Song Liang, PhD

Times: 3-hour each session

Phone Number: 352-273-9203

Email Address: songliang@ufl.edu

Office Hours: By appointment

Teaching Assistants: None

Preferred Course Communications (e.g., email, office phone): email

Prerequisites

Biological Sciences (BSC 2005), or Environmental Science (EVS 3000), or consent of the instructor

PURPOSE AND OUTCOME

Course Rationale and Overview

Worldwide, many public health challenges result from complex and inextricable interactions between human, animal, and the environment, necessitating a systems approach, *One Health*, to addressing the challenges. This intermediate level course introduces concepts, theories, and applications of environmental health sciences in the context of One Health. With an emphasis on environmentally-mediated and zoonotic diseases, the course will cover how key biological and chemical agents affect human health in both developed and developing nations, and how *One Health* approach is utilized to address these health issues. The course combines lectures, discussions, and a class project.

Relation to Program Outcomes

This course provides primary gains or reinforcement of the following competencies:

1. Describe to specific communities or general populations the direct and indirect human and ecological effects of major environmental agents
2. Describe genetic, physiological, and psychosocial factors that affect susceptibility to adverse health outcomes following environmental exposure(s)
3. Specify approaches for assessing, preventing, and controlling environmental hazards that pose risks to human health and the environment
4. Develop testable hypotheses and models to evaluate biological and chemical environmental exposures

Course Objectives and/or Goals

Upon completion of this course, students will be able to:

1. Describe key concepts and theories of environmental health science and its major roles in one health

2. Identify and discuss environmental origins and determinants of health as related to exemplary diseases of human-animal-environment linkages
3. Determine the exposure pathways for key toxins and pathogens, including human-animal-environmental exposure, vector-borne, waterborne, and airborne transmission
4. Assess the effects of global environmental change on health and how both local and global factors affect disease transmission within and between countries
5. Identify and examine major environmental health interventions used to prevent disease and improve human and animal health at the individual, community, and population levels
6. Apply the one health systems approach for addressing interdisciplinary environmental health problems

Instructional Methods

1. Lectures are for orientation. Students are responsible for all the material presented in the lectures and are strongly urged to complete assigned readings
2. Readings and resources: Required readings and resources will be posted in the course site
3. Assessments: A variety of assessments will be used in this course, including exams, and a special project and discussion

What is expected of you?

You are expected to actively engage in the course throughout the semester. Your participation fosters a rich course experience for you and your peers that facilitates overall mastery of the course objectives.

DESCRIPTION OF COURSE CONTENT

Topical Outline/Course Schedule

Week	Topic(s)	Speaker	Reading	Assignment
Week 1 5/9~5/13	<ul style="list-style-type: none"> • Course introduction • Introduction to global environmental health 	Liang	1, 2 (RL) Chapter 2 (OH1)	
Week 2 5/16~5/20	<ul style="list-style-type: none"> • Global burden of disease: concepts and applications • Environmental burden of disease 	Liang	3, 4, & 5 (RL)	
Week 3 5/23~5/27	<ul style="list-style-type: none"> • Environmental epidemiology and ecology in one health • Environmental toxicology in one health 	Liang Bisesi	Chapter 1 & 3 (EH) Chapter 2 (EH) 6 (RL)	
Week 4 5/31~6/3	<ul style="list-style-type: none"> • Risk assessment in one health 	Havelaar	Chapter 29 (EH) Chapter 8 (OH2)	

Week	Topic(s)	Speaker	Reading	Assignment
Week 5 6/6~6/10	<ul style="list-style-type: none"> One Health: systems thinking & circular health Systems approaches in environmental & one health 	Capua	Chapters 4,5, & 6 (OH1) Chapter 10 (OH2) 2 (RL)	
Week 6 6/13~6/17	<ul style="list-style-type: none"> Indoor and outdoor pollution – a global perspective Air pollution & infectious diseases <p><u>Midterm Exam review</u></p>	Coker Liang	Chapter 12 (EH) Chapter 4.2 (OH1) 7 & 8 (RL)	Topic & background of class project (due 6/13)
6/20~6/24	No class			Summer break
Week 7 6/27~7/1	<p><u>Global environment & one health</u></p> <ul style="list-style-type: none"> Environmental/climate change & one health Transmission and control of vector-borne diseases 	Liang	Chapter 10 (EH) 9, 10, & 11 (RL)	Midterm exam Open 6/27~7/1
Week 8 7/5~7/8	<p><u>Water/foods & one health</u></p> <ul style="list-style-type: none"> Water, sanitation, and hygiene Foodborne diseases and the environment 	Ali Liang	Chapters 15 & 18 (EH) 12 & 13 (RL)	Proposed methodologies of class project (due 7/5)
Week 9 7/11~7/15	<p><u>Development & one health</u></p> <ul style="list-style-type: none"> Agriculture, antibiotics, and zoonotic diseases Urbanization & health 	Jeong Liang	Chapter 5 (OH1) 14, 15, & 16 (RL)	
Week 10 7/18~7/22	<p><u>Emerging infectious diseases & one health</u></p> <ul style="list-style-type: none"> The evolving human environment Human-animal-environmental pathogen transmission 	Maurelli Liang	Chapter 11 (OH2) 17 & 18 (RL)	
Week 11 7/25~7/29	<p><u>Social sciences in environmental & one health</u></p> <ul style="list-style-type: none"> Roles of social sciences Case studies <p><u>Final exam review</u></p>	McKune Liang	Chapter 20 (EH) Chapter 8 (OH2)	Project presentation due in Assignment & Discussion by 7/25
Week 12 8/1~8/5	<ul style="list-style-type: none"> Class project presentation: Peer comments Written report Final exam 	Liang		<p><u>Final exam</u> Open 8/1~8/5</p> <p><u>Peer comments</u> on class projects due in discussion by 8/3</p> <p><u>Written report</u> due in Assignment by 8/3</p>

Other key dates: Midterm and final exam review will be posted on Week 6 and Week 11, respectively.

Course Materials and Technology

Textbooks

1. Environmental Health: from Global to Local (2nd edition). Howard Frumkin, John Wiley & Sons, Inc., 2010 (EH)
2. One Health: People, Animals, and the Environment. Ronald M. Atlas & Stanley Maloy, ASP Press, 2014 (OH1)
3. One Health: The Theory and Practice of Integrated Health Approaches. Jakob Zinsstag et al., CAB International, 2015 (OH2)

In addition to the textbooks, literatures for specific lectures are required (see reading list below). All textbooks and literatures are available electronically through the University of Florida Library.

e-Learning in Canvas site

There will be an online site for this course in Canvas, the learning management system supported by the University. Log in at <https://elearning.ufl.edu/> and go to the course site. Here, I will post the syllabus, lecture presentations, exam reviews, and allow for discussions/chats (e.g. on exams and the class project) amongst the students and course leaders. You will also turn in your class project report through this site. Once the course begins, all communication will take place through the e-Learning in Canvas site. This includes all emails. This will eliminate any issues with students not getting emails due to connection problems. It will be your responsibility to check the site on a routine basis to keep up with announcements, emails, and course modifications.

For technical support related to course materials and links, please contact me.

Reading list (RL)

1. Corvalán C, Hales S, McMichael AJ, Millennium Ecosystem Assessment (Program), World Health Organization. Ecosystems and human well-being: health synthesis. Geneva, Switzerland: World Health Organization; 2005. (read page 11-26)
2. Eisenberg JN, Desai MA, Levy K, Bates SJ, Liang S, Naumoff K, et al. Environmental determinants of infectious disease: a framework for tracking causal links and guiding public health research. *Environ Health Perspect.* 2007;115(8):1216-23. doi: 10.1289/ehp.9806. PubMed PMID: 17687450; PubMed Central PMCID: PMC1940110.
3. Prüss-Üstün A, Corvalán C, World Health Organization. Preventing disease through healthy environments: towards an estimate of the environmental burden of disease. Geneva, Switzerland: World Health Organization; 2006. (Chapter 4: Methods) (http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf)
4. Carlton EJ, Liang S, McDowell JZ, Li HZ, Luo W, Remais JV. Regional disparities in the burden of disease attributable to unsafe water and poor sanitation in China. *B World Health Organ.* 2012; **90**(8): 578-87.
5. Smith KR, Corvalan CF, Kjellstrom T. How much global ill health is attributable to environmental factors? *Epidemiology.* 1999; **10**(5): 573-84.

6. Feingold BJ, Vegosen L, Davis M, Leibler J, Peterson A, Silbergeld EK: A niche for infectious disease in environmental health: rethinking the toxicological paradigm. *Environ Health Perspect* 2010, 118(8):1165-1172.
7. Lin HH, Ezzati M, Murray M: Tobacco smoke, indoor air pollution and tuberculosis: a systematic review and meta-analysis. *PLoS Med* 2007, 4(1):e20.
8. Wu, X., Nethery, R., Sabath, M.B., Braun, D., Dominici, F. Exposure to air pollution and COVID-19 mortality in the United States. 2020
(https://github.com/wxwx1993/PM_COVID/blob/master/Manuscript/PM%20and%20COVID%20mortality.pdf)
9. Liang, S., Kintziger, K., Reaves, P., & Ryan, S. J. (2017). Climate change impacts on human health. In E. P. Chassignet, J. W. Jones, V. Misra, & J. Obeysekera (Eds.), *Florida's climate: Changes, variations, & impacts* (pp. 125–152). Gainesville, FL: Florida Climate Institute.
10. Parham, P. E., & Michael, E. Modeling the Effects of Weather and Climate Change on Malaria Transmission. *Environmental Health Perspectives*, 2001, 118(5), 620-626. doi: 10.1289/ehp.0901256
11. Zinsstag J, Crump L, Schelling E, Hattendorf J, Maidane YO, Ali KO, Muhammed A, Umer AA, Aliyi F, Nooh F *et al*: Climate change and One Health. *FEMS Microbiol Lett* 2018, 365(11).
12. Ngwa, M., Liang, S., Kracalik, I., Morris, L., Blackburn, J., Mbam, L., Baonga Ba Pouth, S.F., Teboh, A., Yang, Y., Sugimoto, J., Morris, J.G., Jr. (2016). Cholera in Cameroon, 2000-2012: spatial and temporal analysis at the operational (health district) and sub climate levels. *PLoS Negl Trop Dis* 10(11): e0005105. doi:10.1371/journal.pntd.0005105
13. Yang, K., Lejeune J, Alsdorf, D, Lu, B., Shum CK, Liang S (2012). Global distribution of outbreaks of water-associated infectious diseases. *PLoS NTDs*; 6(2):e1483. (PMCID:PMC3279334)
14. World Health Organization. Environmental and agricultural drivers of infectious diseases of poverty. *In Research Priorities for the Environment, Agriculture and Infectious Diseases of Poverty*. The WHO Technical Report Series. The World Health Organization, 2013.
15. World Health Organization. Environment, agriculture and infectious diseases of poverty: selected example. *In Research Priorities for the Environment, Agriculture and Infectious Diseases of Poverty*. The WHO Technical Report Series. The World Health Organization, 2013.
16. Gong P, Liang S, Carlton EJ, Jiang Q, Wu J, Wang L, Remais JV: Urbanisation and health in China. *Lancet* 2012, 379(9818):843-852.
17. Liang S, Seto EYW, Remais JV, Zhong B, Yang CH, Hubbard A, et al. Environmental effects on parasitic disease transmission exemplified by schistosomiasis in western China. *Proc Natl Acad Sci USA*. 2007; **104**(17): 7110-5.
18. Galvani AP, Bauch CT, Anand M, Singer BH, Levin SA: Human-environment interactions in population and ecosystem health. *Proc Natl Acad Sci U S A* 2016, 113(51):14502-14506.

ACADEMIC REQUIREMENTS AND GRADING

Exams (55% overall) – Midterm (25%) and final exam (30%)

Midterm and final exams will test students' grasp of key knowledge and principles covered in class and applications of such knowledge in practice. The midterm will be worth 25% and the final will be worth 30% of your overall course grade. The final exam will be cumulative (i.e. based on materials covered in whole semester) but mostly on the 2nd half (i.e. from midterm and onward). For both midterm and final exam, a review question sheet, which is primarily based on lecture notes, will be posted on the course website one week before the exam.

These exams will be conducted via the online proctoring service, Honorlock. The use of Honorlock does not require pre-scheduling by students. Prior to test start, students must be prepared to show picture ID. Students must have some administrative permissions on your computer, must take exams with no one else in the room, and will be monitored via their webcam during exams. More information about Honorlock will be posted in the course site. Please see the "Taking Exams" document posted in the course site and the information below on exam proctoring (<https://dce.ufl.edu/media/dceufledu/pdfs/Honorlock-Student-Exam-Preparation-Information.pdf>)

Class Project (45% overall)

Each student is required to undertake an individual class project relevant to environmental and one health. Projects may involve original research (e.g. a study involving data collection and analysis; *check with the instructor if a research project is envisioned that will involve human subjects*), analysis of secondary (including published) data, or modeling-based studies. The project should define a clear research question and study design. The class project consists of three components.

Project presentation (8% of grade)

Students will need to present their class projects. The presentation is expected to be prepared in PowerPoint and presented in a 12~15-minute video, which will be posted in an unlisted posting in YouTube (<http://youtube.com>). Detailed information on this assignment and how to post in YouTube is posted in the Assignment tool within the course site.

Participation - peer comments (5% of grade)

A discussion board will be posted for each project, and the students will be required to comment on work by other students in the class. The participation is graded based on the activities the student engaged in during discussion session. Grade for participation is based on the following scale.

Level of participation in discussion	80%-100% class projects	50%-80% class projects	<50% class projects	No participation
Quality of post	Appropriate comments: thoughtful, reflective, & respectful to others	Responsive and respectful to others	Responsive with limited effort (e.g. I agree with)	No participation
Point (out of 5)	5	3	1	0

Written report (32%)

Each student is expected to write a class project report. The final report should be within 20-30 page limit (doubled-spaced and 11 or 12 point font size) and follow a standard journal manuscript format (e.g. Introduction, Materials and Methods, Results, Discussion and/or Conclusions, References).

To encourage steady progress in the class project throughout the semester, the final project will include the following due dates for ungraded assignments (half to one-page report on each):

- Week 6 – Topic and background of the proposed study (due by 6/13)
- Week 8 – Proposed methodologies (due by 7/5)

Grading rubrics for the project presentation and written report are in appendix.

Grading

Midterm exam: 25% of grade

Final exam: 30% of grade

Class project:

- a. Presentation: 8% of grade
- b. Participation: 5% of grade
- c. Written report: 32% of grade

Grading rubrics for the class project (presentation and written report) are attached in appendix at the end of the syllabus.

Point System Used

%	93% to 100%	90% to 92%	87% to 89%	83% to 86%	80% to 82%	77% to 79%	73% to 76%	70% to 72%	67% to 69%	63% to 66%	60% to 62%	Belo w 60%
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E

Please be aware that a C- is not an acceptable grade for graduate students.

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	WF	I	NG	S-U
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0	0.0	0.0	0.0	0.0

For greater detail on the meaning of letter grades and university policies related to them, see the Registrar's Grade Policy regulations at:

<http://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Exam Policy

Exam Proctoring Service

Honorlock will be used for online proctoring services for the exams in this course. This service will be used by all students taking this course online, regardless of whether you are an on-campus student or not. Detailed guidelines for this proctoring system are available on your course website.

Policy Related to Make up Exams or Other Work

The expectation of this course is that you will view all lectures, read all reading assignments and complete assignments according to the syllabus schedule. Personal issues with respect to class participation or fulfillment of course requirements will be handled on an individual basis.

Please note: Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail me within 24 hours of the technical difficulty if you wish to request a make-up.

Policy Related to Required Class Attendance

As an online asynchronous course there is no classroom attendance required. Student participation in the course site is tracked by the Canvas system and may be referenced in regards to student participation and course advancement.

All faculty are bound by the UF policy for excused absences. For information regarding the UF Attendance Policy see the Registrar website for additional details:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Communication Guidelines

Please use the Inbox tool in canvas for all communication.

Academic Integrity

Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge:

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

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied:

“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code or the Graduate Student Website for additional details:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

<http://gradschool.ufl.edu/students/introduction.html>

Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

Online Faculty Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

SUPPORT SERVICES

Accommodations for Students with Disabilities

If you require classroom accommodation because of a disability, it is strongly recommended you register with the Dean of Students Office <http://www.dso.ufl.edu> within the first week of class or as soon as you believe you might be eligible for accommodations. The Dean of Students Office will provide documentation of accommodations to you, which you must then give to me as the instructor of the course to receive accommodations. Please do this as soon as possible after you receive the letter. Students with disabilities should follow this procedure as early as possible in the semester. The College is committed to providing reasonable accommodations to assist students in their coursework.

Students in UF Health Sciences programs should be mindful that unique course accommodations may not be applicable in a clinical, fieldwork or practicum setting. Thus, planning a semester in advance with the DRC Health Sciences Learning Specialist, Lisa Diekow ldiekow@ufsa.ufl.edu, is highly encouraged.

Counseling and Student Health

Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- The Counseling and Wellness Center 352-392-1575 offers a variety of support services such as psychological assessment and intervention and assistance for math and test anxiety. Visit their web site for more information: <http://www.counseling.ufl.edu>. On line and in person assistance is available.
- You Matter We Care website: <http://www.umatter.ufl.edu/>. If you are feeling overwhelmed or stressed, you can reach out for help through the You Matter We Care website, which is staffed by Dean of Students and Counseling Center personnel.
- 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. 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: <https://shcc.ufl.edu/>
- Crisis intervention is always available 24/7 from:

Alachua County Crisis Center:
(352) 264-6789

<http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx>

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

APPENDIX

Grading Rubrics

Class Project

The class project will be evaluated according to the following criteria.

Presentation

Oral aspect	Score	Visual aspect	Score	Comments
Orally presented information is clear and concise, delivered using effective voice projection and inflection, eye contact, and body language.	4	Visual presentation is organized and appealing, with logical flow of information, appropriate use of color and design and clarity of written material	4	
Oral presentation is good, but could be improved (timing, projection, etc.)	3	Visual presentation contains relevant information, but could be better organized or presented	3	
Fair presentation of information; not polished, lack of attention to detail, but informative	2	Presentation is informative but lacks cohesion, flow, or visual appeal	2	
Orally presented information is rushed, difficult to hear, or otherwise hard to follow	1	Visual presentation is hard to follow and does not add to the overall presentation of the project	1	

Total score: _____ (out of possible 8)

Written Report (a

Criteria	Score (max, 4)	Comments
<i>Introduction and background</i>		
<ul style="list-style-type: none"> • Clear problem statement, use of relevant literature and/or theories 		
<ul style="list-style-type: none"> • Clear statement of significance to one/environmental health issues and public health relevance 		
<i>Methods</i>		
<ul style="list-style-type: none"> • Clear description of study design and/or data 		

<ul style="list-style-type: none"> • Appropriate methods of organizing/analyzing data 		
Results		
<ul style="list-style-type: none"> • Clear description of study results/findings 		
<ul style="list-style-type: none"> • Accurate uses of tables and/or figures 		
Conclusion/Discussion		
<ul style="list-style-type: none"> • Relevance of results, implications to practice and/or future research discussed 		
<ul style="list-style-type: none"> • Limitations discussed and take-home message delivered 		

The score for each criterion is based on the following numerical ratings: 4 – outstanding; 3-good; 2-satisfactory; 1-marginal, 0 – missing.

Total score: _____ (out of possible 32)