SYLLABUS

PLANETARY HEALTH
EVPP 505 / BIOL 507

Fall Semester 2021
Node: Face to Face Course
3 Credit Hours
Lecture: Horizon 1012
Thursdays 4:30–7:10 p.m.

Instructor Information

Instructor: A. Alonso Aguirre, DVM, PhD
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Prerequisite/Co-Requisites

Graduate Students: Courses on Evolution, Disease Ecology, One Health or Conservation Biology. Or permission of instructor.

Safe Return to Campus Statement

All students taking courses with a face-to-face component are required to follow the university's public health and safety precautions and procedures outlined on the university **Safe Return to Campus webpage** (https://www2.gmu.edu/safe-return-campus). Similarly, all students in face-to-face and hybrid courses must **also complete the Mason COVID Health Check daily**, seven days a week. The COVID Health Check system uses a color code system and students will receive either a Green, Yellow, or Red email response. Only students who receive a "Green" notification are permitted to attend courses with a face-to-face component. If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. **Faculty are allowed to ask you** to show them that you have received a green email and are thereby permitted to be in class.

Safe Return to Campus Resources:

FAQ for Safe Return: https://core.sitemasonry.gmu.edu/safe-return-campus/faqs-safe-return
Main Safe Return to Campus Site: https://www2.gmu.edu/safe-return-campus
George Mason University Corona Virus Updates https://www2.gmu.edu/coronavirus
Virginia Department of Health COVID-19 http://www.vdh.virginia.gov/coronavirus/

Medical Library Association COVID-19
Resources https://www.mlanet.org/p/cm/ld/fid=1712&source=5
CDC https://www.coronavirus.gov
NIH https://www.nih.gov/coronavirus
Daily COVID19 Health check reminder https://itsapps2.gmu.edu/symptom/Assessments

Instructor/Student Communication

Email Communication. Per university policy, I am only allowed to communicate with students using GMU.EDU email accounts.

Blackboard. All course-related announcements and emails for this course will be sent through Blackboard (BB). If you have a question or a concern about the course, email me using the mail feature in BB. Students should check BB and their e-mail daily. Failure on your part to check BB and e-mail on a regular basis is not an excuse for missed /late assignments or exams. I will respond to e-mails 48 hours upon receipt, Monday through Friday.

Personal Questions or Concerns. If you have personal concerns or an emergency, please contact me directly at aaguirr3@gmu.edu or Molly Corder at mcorder4@gmu.edu. I am available for meetings by appointment, online, via Blackboard Collaborate.

Ask the Professor – "Ask the Professor "is a forum under the Discussion Board tab on BB for asking me questions about the course that may be on interest to the entire class. If you have questions about a lecture or the project please use this forum in the Discussion Board tab on blackboard, so that your classmates can benefit from my response. There is a tab linking to the *Discussion Board forum* on the left side of the course BB page. You can also access this from the discussion tab. Please allow up to 48 hours for a response to an email.

Course Description
Very rapid human population growth combined with even more rapid growth in per capita consumption are driving an extraordinary transformation of most of Earth's natural systems including its climate system, its oceans, land cover, biogeochemical cycles, biodiversity, and coastal and fresh water systems. These are the biophysical systems that underpin global food production, our exposure to infectious disease and natural hazards, even the habitability of the places where we live, and global environmental change is a major driver of disease burden over the coming decades. The course covers interdisciplinary scientific issues and seeks solutions to many of the planetary problems we face today including biodiversity changes, ecosystem modifications, climate change, agriculture development, intensive farming, transcontinental air transport, international trade, emerging and resurgent diseases. Planetary Health (PH) will provide students with a big picture perspective, research, policy and practice issues and the implications and opportunities related to planetary health for public and population health globally. A key theme throughout will be consideration of health and social equity issues and the differential impacts of climate and other environmental changes on species and ecosystems in light of these issues.

Course Objectives and Student Learning Outcomes
Students will be able to use a Planetary Health (PH) lens to understand the connectedness between environmental change and human health outcomes. Also, they will be able to examine ecological determinants of human health and to predict the likely health consequences of environmental change. By

the end of the course, students will understand how humanity manages Earth's natural systems and is a primary determinant of future global health. Upon completion of the course, students will be able to:

1) Able to clearly define the concept PH and identify the ecological determinants of health, Conservation Medicine, EcoHealth, and One Health.
2) Critically assess the nature of the Anthropocene and articulate current trends in knowledge and thinking about the impacts on humans, biodiversity and ecosystem services.
3) Specify key human health effects and indicators across the lifespan related to PH and global environmental change.
4) Specify key sources of data on surveillance systems and describe key methodological challenges and limitations in studying PH.
5) Critically describe the implications for research, policy and practice, conservation of biodiversity, ecological health, global health and agricultural policy; and
6) Provide experimental design of research and policy perspectives with the PH lens.

Basic Course Technology Requirements
Depending on the COVID-19 epidemiological situation; activities and assignments in this course may use the Blackboard learning system, available at https://mymason.gmu.edu. ***Students are required to have regular, reliable access to a computer with an updated operating system*** *(recommended: Windows 10 or Mac OSX 10.13 or higher)* ***and a stable broadband Internet connection*** *(cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher.* ***Some activities and assignments in this course may use web-conferencing software*** *(Blackboard Collaborate / Zoom.*

Learning Modules - This course is organized into Course Content Modules. Included in these modules are: 1) lecture topics, 2) required readings due before the start of class, 3) descriptions of any activity or assignment that you need to complete, 4) themes throughout the module, and 5) learning objectives students are expected to master within each module. All course materials are available on Blackboard. Classes will be split up into 3 modules based on topic area, with recorded lecture notes and assignments related to covered material and applied ecology articles.

Course Expectations
Each session will combine lectures, class exercises, occasional guest speakers and student discussion. As with any cross-listed course (undergrad/grad) offering, ***this will not be an easy course***. The successful student **must read assignments, study supporting materials, and prepare assignments outside of class**. Self-directed study skills are important. Students need to organize material logically and communicate well orally and in writing.

Sharing of materials may be limited by what those materials contain and where they are shared. Sharing of instructor-created materials, particularly materials relevant to assignments or exams, to public online "study" sites is considered a violation of Mason's Honor Code. *Some kinds of participation in online study sites violate the Mason Honor code: these include accessing exam or quiz questions for this class; accessing exam, quiz, or assignment answers for this class; uploading of any of the instructor's materials or exams; and uploading any of your own answers or finished work. Always consult your syllabus and your professor before using these sites.*

Required Textbook
Myers S. and H. Frumkin (eds.). 2020. *Planetary Health: Protecting nature to protect ourselves*., Island Press, Washington DC, 456 pp.

Recommended Scientific Journals
Anthropocene https://www.sciencedirect.com/journal/anthropocene
EcoHealth https://www.springer.com/journal/10393
Elementa: Science of the Anthropocene https://online.ucpress.edu/elementa
The Lancet Planetary Health https://www.thelancet.com/journals/lanplh/home
One Health https://www.journals.elsevier.com/one-health
One Earth https://www.cell.com/one-earth/home

Honor Code
The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using the appropriate format for this class. A simple listing of books or articles is not sufficient. **Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting.** If you have any doubts about what constitutes plagiarism, please see me.

Projects in this class are designed to be completed within your study group. With collaborative work, names of all the participants should appear on the work. Collaborative projects may be divided up so that individual group members complete portions of the whole, provided that group members take sufficient steps to ensure that the pieces conceptually fit together in the end product. Other projects are designed to be undertaken independently. In the latter case, you may discuss your ideas with others and conference with peers on drafts of the work; however, it is not appropriate to give your paper to someone else to revise. You are responsible for making certain that there is no question that the work you hand in is your own. If only your name appears on an assignment, your professor has the right to expect that you have done the work yourself, fully and independently.

Mason is an Honor Code university; please see the Office for Academic Integrity https://oai.gmu.edu/ for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially, when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Disability Accommodations

If you are a student with a disability and you need academic accommodations, please notify the instructor and contact the Office of Disability Services (ODS) https://ds.gmu.edu/. All academic accommodations must be arranged through the ODS. Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474

Diversity and Inclusion

We seek to create a learning environment that fosters respect for people across identities. ***We welcome and value individuals and their differences, including gender expression and identity, race, economic status, sex, sexuality, ethnicity, national origin, first language, religion, age and ability.*** *We encourage all members of the learning environment to engage with the material personally, but to also be open to exploring and learning from experiences different than their own.*

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence

George Mason University is committed to providing a learning, living and working environment that is free from discrimination and a campus that is free of sexual misconduct and other acts of interpersonal violence in order to promote community well-being and student success. We encourage students who believe that they have been sexually harassed, assaulted or subjected to sexual misconduct to seek assistance and support. University Policy 1202: Sexual Harassment and Misconduct speaks to the specifics of Mason's process, the resources, and the options available to students. *As a faculty member and designated "Responsible Employee," I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per university policy 1412. If you wish to speak with someone confidentially, please contact the Student Support and Advocacy Center (703-380-1434) or Counseling and Psychological Services (703-993-2380). You may also seek assistance from Mason's Title IX Coordinator (703-993-8730;* titleix@gmu.edu*).*

Assignments and Grading

Class Participation and Exercises

Throughout the semester there will be several exercises that you will need to complete and will count towards your participation grade. The exercises may be offered during each class.

Health Framework Assignment

Each student will identify and define the major health frameworks discussed in Module 1. In 400 words, each student will compare/contrast the health frameworks. Students must include citations from at least 3 scientific journal articles to support their claims. Students should consider the following features of each health framework:

1) Does this framework emphasize one concept disproportionately over others (i.e. human health)?
2) Is this framework transdisciplinary in nature?

3) Does this framework apply systems thinking to solve health problems?

Case Study Reports
After reviewing the provided case study, students will write an essay in no more than 600-words. The essay should describe the stakeholders involved, PH problem, and the recommended PH solution. Then, you must describe if you agree with the proposed PH solution. If you do not, suggest an alternative solution to the PH problem described. You should include:

1) The scope of the ecological disruption behind the planetary health problem in terms of systems thinking
2) Transdisciplinary solutions
3) Ethical considerations of possible solutions
4) Clearly describe how stakeholders fit into the planetary health solution.

Quizzes
Three quizzes will be given throughout the course. These will be timed, but not be cumulative, and made up of multiple choice, short answer, essay, fill in the blank, matching, definitions, and True/False. General questions about the lecture, textbook and class exercises will be fair game. A curve may be assigned depending on overall scores, discussing the quiz or sharing information about it is prohibited.

Final Exam
The final exam will contain two parts: part one will test your knowledge of concepts and information taught throughout the course predominately in the form of power point lectures and textbook chapters. Part two is a real-life, case-based scenario. It will require you to apply what was learned to solve actual/real environmental issues related to PH.

Final Project & Presentation
For graduate students ONLY. This assignment is optional for undergraduate students to improve their grades.

Towards the end of the semester, you will be able to synthesize the major features, themes, and methods in the PH framework. After you receive the description of your real-world PH problem, you will apply a *transdisciplinary* approach that utilizes *adaptive management* and *systems thinking* to propose a PH solution. *You will receive a detailed description of planetary health problem. You will work as a team to develop a strategic plan that will solve the planetary health problem*. We will review the components of a strategic plan and applications during an in-class exercise early in Module 3. Detailed instructions will be provided. The final project will consist of teamwork, strategic plan development, writing, and a presentation.

Presentations will be graded on the clarity of the presentation, the professionalism of the slides, the content of the material presented and your ability to answer questions posed by classmates and instructor. Each topic below will get a score ranging from **1** (poor), **2** (good), **3** (very good) **4** (excellent).

The slide presentation "rule of thumb" is 1 slide per minute, so plan accordingly. Your 1st slide should be a title slide with your name and title of the talk. Next should be an introduction & overview to the topic followed by more specifics. Next you should discuss the implications of the issue and management

recommendations if any. Finally, you should provide conclusions and highlight the main points. You will give a 20-minute presentation as a team followed by 10 minutes for Q&A. The field project and presentation are worth *20% of your grade*. The issues/topics (*but not the contents*) for the presentations are not limited to those covered in the textbook. Presentations will be **30 minutes total.**

Grading Criteria
The total grade received for this course will be based on the following assignments and assessments:

Activity	Graduates %Contribution to Total Grade
Class participation	5%
Extra readings	5%
Health frameworks assignment	10%
Case study reports	20% (10% each)
3 quizzes	15% (5% each)
Final Exam:	25%
Final project & presentations:	20%
TOTAL	**100%**

The final grade for graduate students will be based on this scale: A= 100–90%, B= 89-80, C = 79–70%, D= 69–60%, F < 59%.

A CURVE WILL NOT BE APPLIED.

COURSE SCHEDULE*

Module 1: Transdisciplinarity				
Week	***Date***	***Topic***	***Book Chapters***	***Additional Readings***
1	08/26	Introductions. Syllabus. Course expectations. From conservation medicine to planetary health	Chapters 1 & 2	Aguirre et al. 2019
2	09/2	The human ecological footprint	Chapter 3	Ellis 2019
3	09/9	A changing planet	Chapter 4	Patz et al. 2004
4	09/16	Food and nutrition on a rapidly changing planet Environmental change, migration, conflict, and health ***Quiz 1***	Chapter 5 Chapter 8	Golden et al. 2016

Themes

1. Quantifying externalities (health costs)
2. Surprises and unintended consequences
3. The role of political power

Objectives

- Graduate students will critique and evaluate qualitative and quantitative planetary health research methods.
- Graduate students will develop a planetary health 'lens' through which they will synthesize, critique, apply, and extend major health frameworks.
- Graduate students will communicate effectively, both orally and in writing about planetary health theories, arguments, methods, and concepts in terms of specific ecological challenges including climate change, biogeochemical cycles, changes in land-use and land cover, arable land and soil, water scarcity, biodiversity loss, and pollution.

***Schedule is subject to change**

Module 2: Urgency & Systems Thinking				
Week	***Date***	***Topic***	***Book Chapters***	***Additional Readings***
5	09/23	Planetary health and infectious disease Global environmental change and noncommunicable disease risks ***Health frameworks assignment due***	Chapter 6 Chapter 7	Wilcox et al. 2019
6	09/30	Climate change and human health Energy and planetary health	Chapter 10 Chapter 12	Myers 2017
7	10/7	Urban places and planetary health Controlling toxic exposures ***Case Study Report 1 due***	Chapter 13 Chapter 14	Wilson & Jonas 2018
8	10/14	New economics for planetary health The business of planetary health: from economic theory to policy and practice ***Quiz 2***	Chapters 15 Chapter 16	Whitmee et al. 2015

Themes

1. The human relationship with nature
2. There are winners and losers
3. New ethical terrain

Objectives

- Graduate students will integrate aspects of systems thinking and transdisciplinarity to create specific solutions-based case studies that provide foundational framework for solving planetary health problems.
- Graduate students will demonstrate knowledge human-drive environmental changes can result in unintended consequences for human health.
- Graduate students will model real-world stakeholder perspectives and participate in the negotiation of transdisciplinary problem-solving approaches for planetary health problems.

Module 3: Acceleration and Proactive Approaches				
Week	***Date***	***Topic***	***Book Chapters***	***Additional Readings***
9	10/21	Planetary health ethics A bright future for planetary health Strategic planning exercise	Chapter 17 Chapter 18	Goldberg & Patz 2015
10	10/28	Wild creatures in wild places – wildlife trafficking Webinar lecture **Wildlife trafficking case study – in class**		Aguirre et al. 2020
11	11/4	Planetary Health, wildlife & biodiversity ***Quiz 3***		Case Studies
12	11/11	The Interconnectedness of People and Planet. *Dr. Carlos Faerron, Director, InterAmerican Center for Global Health (CISG), Costa Rica*		Case Study 10
13	11/18	***Final Exam***		
14	11/25	***Thanksgiving Holiday***	***No class***	
15	12/2	***Final Project & Presentations due*** ***Case Study Report 2 due***		

Themes

1. Reducing vulnerability is critical
2. Social action
3. Movement building
4. Planetary Health applications

Objectives

- Graduate students will work in transdisciplinary teams to produce strategic plans that could be utilized to solve real-world planetary health problems.
- Graduate students will communicate with planetary health experts across the world to produce nuanced perspectives and evaluate the inputs needed to preserve the earth's natural systems upon which human health depends.
- Graduate students will demonstrate proficiency in the professional skills required to participate in scholarly and applied aspects of planetary health.