Course Change Request

New Course Proposal

Date Submitted: 09/20/21 10:45 am

Viewing: BIOL 528 : Planetary Health

Last edit: 09/20/21 10:45 am

Changes proposed by: dpolayes

Are you completing this form on someone else's behalf?

No

In Workflow

1. **BIOL Graduate Representative**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Graduate
5. Registrar-Courses
6. Banner

Approval Path

1. 09/20/21 9:59 pm Iosif Vaisman (ivaisman): Approved for BIOL Graduate Representative

Effective Term: Fall 2022

Subject Code: BIOL - Biology

Course Number: 528

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Planetary Health

Banner Title: Planetary Health

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

Repeatable: May only be taken once for credit (NR)
GRADUATE ONLY

Default Grade Mode: Graduate Regular

Recommended Prerequisite(s):
Courses on Conservation Medicine, Evolution, Disease Ecology, One Health or Conservation Biology, or permission of instructor.

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(	Course/Test Code	Min Grade/Score	Academic Level	)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description:
As the pace and scale of human impacts on Earth's natural systems continue to increase, there is growing importance in understanding and quantifying the implications of these accelerating changes for human health. Throughout this course, we will study 'Planetary Health' which addresses the human health impacts

of accelerating environmental change through interdisciplinary approaches including environmental science, political science, and public health.

Justification:

The biology master's program can use more courses on the importance of the environment and its relationship to health. This course complements our existing courses.

Does this course cover material which crosses into another department? No

Learning Outcomes:

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.

Attach Syllabus

BIOL528-Syllabus.pdf

Additional Attachments

Staffing:

Dr. A. Alonso Aguirre

Relationship to Existing Programs:

This new course will complement the biology MS program

Relationship to Existing Courses:

cross listed with EVPP 528

Additional Comments:

Reviewer Comments

Key: 17308

BIOL528-Planetary Health

Instructor Information Instructor: A. Alonso Aguirre, DVM, PhD
Professor and Department Chair
Office: David King (Room 3005)
Department of Environmental Science and Policy College of Science
703-993-7590
aaguirr3@gmu.edu
Prerequisite/Co-Requisites At least one ecology, conservation biology, epidemiology, disease ecology or one health course. Or permission of instructor.

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. 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 Activities and assignments in this course will regularly 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. Activities and assignments in this course will regularly use web-conferencing software (Blackboard Collaborate / Zoom). In addition to the requirements above, students are required to have a device with a functional camera and microphone. In an emergency, students can connect through a telephone call, but video connection is the expected norm.

The online learning environment: It is important that you become familiar with this syllabus, the course requirements, all course policies, and how to navigate in BB including within the online structure unique to this course. Since we do not meet in a classroom, I am not able to provide daily reminders of impending due dates for assignments, and projects. This is your responsibility.

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

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 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 in class. We will use Blackboard Collaborate Ultra as the platform to split into working groups as required

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, fill in the blank, matching, definitions, and True/False. General questions about the lecture, textbook and class exercises will be fair game. Quizzes will be timed and open notes, a curve may be assigned depending on overall scores, discussing the quiz or sharing information about it is prohibited. Quizzes will open on Sunday at 12:00 noon and closed Tuesday at 6:00 pm.

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. All the materials you need for the exam will be in the Assessments Tab on BB.

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

Activity	Graduate %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 will be based on this scale: A+ = 100–97%, A = 96-93%, A- = 92-90%, B+ = 89-86%, B=85-83, B- = 82-80%, C = 79–70%, D = 69–60%, F < 59%.

A CURVE WILL NOT BE APPLIED.

Module 1: Transdisciplinarity

Week	***Date***	***Topic***	***Book Chapters***	***Additional Readings***
1	08/28	Introductions. Syllabus. Course expectations. From conservation medicine to planetary health	Chapters 1 & 2	Aguirre et al. 2019
2	09/4	The human ecological footprint	Chapter 3	Ellis 2019
3	09/11	A changing planet	Chapter 4	Patz et al. 2004
4	09/18	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

1. Students will develop a planetary health 'lens' in which they can identify critical linkages, cause-effect relationships, and feedback loops between environmental change and human health. Students will explain planetary health 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.
2. Students will explain planetary health and compare/contrast to common health frameworks. Students will consider bottom-up and top-down approaches in planetary health
3. Students will explain how planetary health is intrinsically policy-oriented. Students will understand the role that organizing plays in community and movement building.

Module 2: Urgency & Systems Thinking				
Week	***Date***	***Topic***	***Book Chapters***	***Additional Readings***
5	09/25	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	10/2	Climate change and human health Energy and planetary health	Chapter 10 Chapter 12	Myers 2017
7	10/9	Urban places and planetary health Controlling toxic exposures ***Case Study Report 1 due***	Chapter 13 Chapter 14	Wilson & Jonas 2018
8	10/16	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

1. Students will apply systems thinking to a changing planet and articulate specific examples. Students will understand how planetary health is driven by the scale of environmental change, its effects on human health, and the urgency with which the global population must respond.
2. Students will incorporate knowledge of systems thinking and develop collaborative skills to create solutions for overcoming gaps in research and subsequent policy development.
3. Students will think critically about whose health is at stake during shifts in the Earth's natural systems. Students will consider how health is measures and will recognize differences in equality and equity. Students will further understand the concepts of marginalization, vulnerability, and resilience.
4. Students will recognize the limitations of predictive impact assessments.
5. Students will think critically about how human-drive environmental changes can result in unintended consequences for human health.

Module 3: Acceleration and Proactive Approaches				
Week	***Date***	***Topic***	***Book Chapters***	***Additional Readings***
9	10/23	Planetary health ethics A bright future for planetary health Strategic planning exercise	Chapter 17 Chapter 18	Goldberg & Patz 2015
10	10/30	Wild creatures in wild places – wildlife trafficking Webinar lecture **Wildlife trafficking case study – in class**		Aguirre et al. 2020
11	11/6	Planetary Health, wildlife & biodiversity ***Quiz 3***		Case Studies
12	11/13	The Interconnectedness of People and Planet. *Dr. Carlos Faerron, Director, InterAmerican Center for Global Health (CISG), Costa Rica*		Case Study 10
13	11/20	***Final Exam***		
14	11/27	***Thanksgiving Holliday***	***No class***	
15	12/4	***Case Study Report 2 due***		

Themes

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

Objectives

- Students will understand the communication methods available and how to select tools to convey challenges and solutions to diverse audiences.
- Students will understand the concept of 'bias' whether political, social, or economics could be driving presentation and perceptions of environmental change and the resultant health effects.
- Students will understand how stakeholder interests can shape policy implementation; how governance is used as a strategy for the decision-making process; and how governing bodies can fail in policy implementation.
- Students will understand historical and current global values to grasp the necessity and urgency of planetary health.
- Students will realize their own cultural identities recognizing inherent membership in local and global communities; defining values and practices of the next generation to positively affect those communities.