

ENV H 439 and 539: One Health: Human and Animal Health in a Changing Environment

Spring Quarter 2018

Day/time: MW 8:30-9:50 South Camps Center 221

INSTRUCTORS: Marguerite Pappaioanou DVM, MPVM, PhD

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TA OFFICE HOURS: Mondays, 10:00-11:00 AM at tables outside of the computer classrooms on the 3rd floor of the Health Sciences library]]

GUEST SPEAKERS:

Vickie Ramirez, MA in Medical Anthropology, Sr. Research Coordinator/Program Coordinator, Center for One Health Research, UW

Gemina Garland-Lewis, MS in Conservation Medicine, Research Coordinator, Center for One Health Research, UW,

Jennifer Gardner, MD, Assistant Professor, Division of Dermatology, UW School of Medicine

Michele Jay-Russell, DVM, MPVM, PhD, DACVPM, Program Manager/Research Microbiologist, Western Center for Food Safety

Leslie A. Colby, DVM, MS, DACLAM, Associate Professor, Dept. of Comparative Medicine

Sally Thomson-Iritani, DVM, PhD, CPIA, Director, Office of Animal Welfare, UW

Mary Margaret Callahan, Senior National Director of Program Development at Pet Partners, where she oversees the Therapy Animal Program which registers nine different species.

Ann Graves, B.Sc on Zoology, Executive Director, Seattle Animal Shelter

Ron Wohrle, DVM, MPH, WA State Public Health Veterinarian

Hanna Oltean, MPH, Zoonotic Disease Epidemiologist

Elizabeth Dykstra, PhD, BCE, Public Health Entomologist

Julianne Meisner, BVM & S, MS, Graduate Research Student Assistant, Dept. of Epidemiology, School of Public Health, UW

COURSE DESCRIPTION:

One Health is a multiple, transdisciplinary approach to achieving optimal health by focusing on the inextricable connections between human, animal, and environmental health, and incorporating multiple perspectives and experiences of these and other disciplines into assessing health problems and finding the most effective solutions. Using a case-based approach, the course will explore an application of integrated approaches to assessment, prevention, treatment, and control of a number of current health challenges at the human-animal-environment interface, such as emerging zoonotic infectious diseases (diseases transmitted between animals and human), planetary health, animals as sentinels of disease and environmental hazards, health aspects of the human-animal bond, and the comparison of spontaneous diseases between humans and animals (human-animal medicine).

LEARNING OBJECTIVES (Joint 439 and 539):

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

1. Explain from an ecological perspective the connections among human health, animal health and ecosystem health (e.g., One Health)
2. Explain the relationships between One Health, Conservation Medicine, Planetary Health, and Global Health
3. Identify seven general One Health competency domains, such as systems thinking, teamwork, including leadership, management, working as a team member, conflict resolution, roles and responsibilities, inter-professional communication, ethics, and others
4. Systematically research assigned health challenges, as a member of an interdisciplinary problem-solving group/team, to contribute to the group's exploration of the linkages between human health, animal health, and environmental health, in the assessment of and identification of multidisciplinary approaches to effectively address One Health challenges.
5. Identify at least three major zoonotic diseases and explain the human, animal, and environmental aspects of their prevention and control.
6. Describe at least two examples of animals serving as sentinels for human environmental health hazards, and why this phenomenon occurs.
7. Describe the comparative clinical presentation of at least two diseases across at least 3 species (including humans)
8. Identify 4 health effects associated with the human-animal bond and how this bond can be used to add value when addressing disease or other health conditions in clinical settings.
9. Identify, for at least 3 different One Health scenarios, the relative roles of human/public health providers/officials, animal health providers/officials, and environmental health professionals/officials
10. Describe at least three benefits of using a One Health approach to address today's health challenges
11. Describe at least three barriers to employing a One Health approach to address current health challenges, and options for overcoming them.

GRADUATE LEVEL COURSE OBJECTIVES (539 only):

On completion of the course, graduate students will be able to:

1. Lead and facilitate a small group problem-solving, discussion session focused on addressing a health problem from a One-Health Perspective. The group being facilitated will comprise members representing human, animal, and environmental health perspectives, respectively, and the outcome of the discussion will be a One Health data-based strategy for assessing, managing, preventing, and mitigating the health challenge.
2. Compose a brief summary of the group discussion, that integrates human, animal, and environmental health perspectives contributed by group/team members. The brief report will identify the challenge being addressed, briefly describe individual contributions of human, animal, and environmental health representatives, and conclude with recommendations for an integrated One-Health strategy.
3. Discuss Planetary Health perspectives relevant to the problem-solving case study exercises included in the course curricula.

TEXTS and REFERENCES:

- There is no required textbook. **The primary recommended text for this course will be: Human-Animal Medicine: Clinical Approaches to Zoonoses, Toxicants and Other Shared Health Risks by Peter M. Rabinowitz and Lisa A. Conti. Saunders: Elsevier Press, New York.** This text book will be on reserve at the Health Sciences Library and at the COHR suite. An electronic version will also be available through the Health Sciences Library.
- Additional reading assignments and course materials, such as power point lecture presentations, and or additional material will be provided as handouts by posting them on the Canvas site.
- In addition, the following books, reports, and journals are additional recommended references for the material presented in this course. The books are available for reading in the Center for One Health (COHR) lab office (there is no option for checking them out—all reading must be done in the COHR lab. The Reports listed below can be readily accessed for free online.

Books

- One Health: People, Animals, and the Environment. 2014. Ron Atlas and Stanley Maloy, Eds. ASM Press
- Confronting Emerging Zoonoses: The One Health Paradigm. 2014. Yamada, A., et al. (Eds) Springer, New York, NY
- Zoobiquity: The Astonishing Connection Between Human and Animal Health. 2013. Barbara Natterson- Horowitz, B, Bowers K. Vintage Press.
- One Health: The Human-Animal-Environment Interfaces in Emerging Infectious Diseases. 2013. Mackenzie, J.S., et al (Eds.) Springer, New York, NY
- Spillover: Animal Infections and the Next Pandemic. 2012. David Quammen. WW Norton and Company. New York.

- One Health: Science, Politics, and Zoonotic Disease in Africa. 2016. Bardosh K (ed.). Routledge: New York.

Reports: The reports below are available for free online

- National Research Council (US) Committee on Achieving Sustainable Global Capacity for Surveillance and Response to Emerging Diseases of Zoonotic Origin; Editors: Gerald T. Keusch, Marguerite Pappaioanou, Mila C. Gonzalez, et al. 2009. National Academies Press (US): Washington DC. (Available online at NAS, can be downloaded)
- Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–*Lancet* Commission on planetary health. *The Lancet*, Vol. 386, No. 10007 (Available online)

Recommended Journals (available online through UW libraries)-

- | | |
|---------------------------------------|-------------------------------------|
| • One Health Journal | • Lancet Planetary Health |
| • International Journal of One Health | • Environmental Health Perspectives |
| • Emerging Infectious Diseases | • EcoHealth |
| • Lancet | • PLoS One |

CLASS PARTICIPATION:

Class sessions will include lectures and group problem-solving sessions focused around case-studies focused on different One Health challenges. Successful participation in this course will require completion of required readings ahead of class, class participation that includes sharing experiences, asking and or answering questions in class, actively working and interacting with team members in problem-solving sessions, and taking exams in an on-line format.

Although attendance in lectures is not expressly required, students are encouraged and expected to participate in classroom discussions during lecture sessions and group problem solving sessions, having fully prepared for class by completing assigned readings before lectures and problem-solving case studies. Students will not have the opportunity to earn class participation credit for course periods during which they are absent.

Please note that during regular case-study problem-solving discussions (extra credit self-study exercises are exempted), other than computers which graduate student group leaders will use to take notes of the discussion, the use of *electronic devices (computers, tablets, smart phones) will not be permitted.*

CLASSROOM CLIMATE, DIVERSITY, INCLUSION, AND RESPECT

Diverse backgrounds, embodiments, and experiences are essential to the critical thinking endeavor at the heart of university education, including at the heart of One Health. Therefore, I expect you to follow the UW Student Conduct Code in your interactions with your colleagues and me in this course by respecting the many social and cultural differences among us, which may include, but are not limited to: age, cultural background, disability, ethnicity, family status, gender identity and presentation, citizenship and immigration status, national origin, race, religious and political beliefs, sex, sexual orientation,

socioeconomic status, and veteran status.

I will acknowledge from the beginning that all of us, including your instructors, have a lot to learn about combatting racism, sexism, classism, and other forms of discrimination and bias, and that this learning process will continue throughout our careers. I am committed to supporting and ensuring a respectful, open, positive, inclusive classroom climate. Please reach out to talk with me, Marguerite Pappaioanou, right away if you experience disrespect in this class, and I will work to promptly address it in a constructive, educational manner, while assuring privacy. Please note that DCinfo@uw.edu is a resource for students with classroom climate concerns. UW students can also report incidents of bias or violations of UW policies for non-discrimination using the Bias Reporting Tool available at: <http://www.washington.edu/bias/>. And another option for communicating concerns, would be to contact the Graduate Program Coordinator (Dr. Scott Meschke, jmeschke@uw.edu) or Ms. Trina Sterry, the Graduate Program Advisor (tsterry@uw.edu).

COURSE FORMAT:

The course is divided into 6 modules: 1) Introduction to One Health (including Planetary Health; Practicing One Health, Evaluation, and Outcomes); 2) Emerging Zoonotic Infectious Diseases; 3) Animals as Sentinels of Human Disease and Environmental Hazards, 4) Human Animal Medicine; 5) The Human-Animal Bond, and 6) Emergency Preparedness and Response.

Lectures: Most sessions will include an interactive lecture, providing background information on the human, animal, and environmental health aspects of different health issues being covered by the course. These didactic sessions will provide useful background on the current case being addressed in the group problem sessions, and/or recapping of key learning points from the previous case.

Group /team problem-solving sessions: A central feature of the course will be One Health group/team problem-solving sessions based on a case study framework. These sessions will focus on current or recent disease problem scenarios, to be assessed and addressed from a One Health perspective involving human, animal, and environmental health perspectives. In addition, the groups will explore planetary health aspects of each case. Several of the case studies will relate to actual research and practice taking place at the UW Center for One Health Research or other related efforts in our region, while others may focus on current disease outbreaks or emergency response scenarios of national or global importance.

Small groups “teams”: Case studies will be worked on in small groups (i.e. “One Health teams”) comprising approximately 8 or fewer students. The number and size of teams will be determined by the final class enrollment. Class participants will be assigned to groups randomly. Each team will include and discussion will be facilitated and guided by at least one graduate student “team leader”. For each case study, under-graduates (team members) will be assigned to represent either the human health, animal health, or environmental health aspects of the case.

With respect to the One Health competency “Leadership”, the graduate student team leader will provide One Health leadership by facilitating the discussion, and integrating the three perspectives shared during the discussion, enhanced by considerations of Planetary Health, to compose a summary report of approximately 1-3 pages (further details on format to be

provided as a handout). Taking the numbers of undergraduate and graduate students enrolled in the course into account, which will determine numbers of groups, there may be more than one graduate student assigned to the small groups. For each problem-solving case-study, one graduate student will serve as team leader, and be responsible for developing the summary report. The 1-2 other graduate students in the group will be assigned to represent planetary health aspects of the case, and if numbers permit, to take notes of the discussion. Enrollment numbers permitting, each graduate student will have the opportunity to serve as team leader for at least two cases.

Structure of the problem-solving case- based sessions:

a. Introductory session for each case

For each case, there will be a brief (approx. 20 minute) didactic introduction to the case, followed by in-class group discussion allowing groups to work on developing a strategy and approach for problem-solving. As part of this initial discussion, the undergraduate team members will be assigned to represent either human, animal, or environmental health aspects of the case. Over the course of the quarter, there will be rotation of these assignments so that each student has the opportunity to research and present from each of the three perspectives (human, animal, and environmental health) at least once in a group problem-solving session.

b. Case problem solving session (s)

Following the introductory session of each case, there will be at least one subsequent problem-solving session in class, where student teams will get a chance to discuss the case-study and work on an integrated one health approach to solving various aspects of the case study. This will include presentations made by student One Health team members assigned to human, animal, environmental health, and planetary health perspectives of the case, respectively, followed by the graduate student One Health team leader leading a team discussion on options for integrated One Health solutions to the case problem. Not later than 28 hours before the written report is due, undergraduate students (human, animal, environmental health) and graduate planetary health representatives, will be expected to submit to the graduate student team leader, a two-paragraph summary of their representative disciplinary contribution, which will be used for composing the summary group report.

Following the case-study introduction, and prior to the team problem-solving session of each case study, team members will be expected to read the assigned reading for their assigned specialty, and develop and submit to their graduate student team leader, ahead but no later than 10 minutes before class, three main bulleted talking points that they will be using for their contributions to the team problem-solving discussions.

c. The following is an example of the schedule for a One Health team problem-solving session:

- 8:30- 8:42: presentation of human health aspect of case (including answers to case questions) (human health student team member or subgroup)
- 8:42-8:54: presentation to the group of animal health aspect of case (including answers to case questions) (animal health student team member or subgroup)
- 8:54-9:06: presentation to the group of environmental health aspect of case (including answers to case questions) (environmental health student team member or subgroup).

- 9:06-9:18: presentation to the group of planetary health aspect of case by the graduate student planetary health team member or subgroup)
- 9:18-9:50: Under the guidance and facilitation by the graduate student One Health Team Leader, the multidisciplinary team discusses and agrees upon a One Health strategy for resolving the case-study problem and tracking the impact of the intervention.
- Following the last team problem-solving session for each case (typically the next class session), the graduate student team leader submits a short summary write-up of the team assessment and problem-solving strategy.

d. Grading of small group/team sessions:

At the conclusion of each case study, each team, led by the graduate student team leader, will submit one write-up for the team. Individual undergraduate students / team members will contribute sections for their specialty, and individual graduate student team member will contribute their planetary health sections, which the graduate student team leader will then edit, synthesize, and use to compose the team summary report. One grade will be assigned to all team members for this write up.

EXTRA CREDIT OPPORTUNITIES : ONE-HEALTH SELF-STUDIES

1. COMPLETING A ONE HEALTH PROBLEM-SOLVING CASE STUDY ON ANTHROPOLOGIC ASPECTS OF INVESTIGATING A POSSIBLE FOODBORNE DISEASE OUTBREAK TIED TO FRUIT BAT CONSUMPTION. A regular class is not scheduled on April 4, 2018. For extra credit, students may come to the classroom, and in self selected/formed teams, or as individuals, read and complete this case study. An introduction to the Case study and a first set of questions to be answered from different disciplinary perspectives, will be made available on April 4th. Students would come to the classroom, and between 8:30 to 9:10, they would read the case-study, and answer a first set of questions. At 9:10, a printed handout that provides additional information, and a second set of questions, will be made available in class. Students will have until 9:50 to continue to work on this study, in their self-selected teams, or individually. Individual write-ups that include answers to the questions posed will be due the start of class on May 2, 2018.

2. OPPORTUNITY AT THE SEATTLE WOODLAND PARK ZOO. Students may undertake and complete an optional One Health self-study conducted at Seattle Woodland Park Zoo. Zoos are playing an increasing role in connecting people to nature, and in promoting the goals of One Health. Students will choose one of six topic areas, address the questions posed as part of that topic, and write a brief report on the topic (2-4 pages in length, double spaced, 12 font, 1 inch margins) to be submitted no later than at 12 noon June 4, 2018. Students will visit the zoo outside of scheduled class time. Reports are to be based on information collected from the internet, and from observations and information collected during their Zoo visit. Given the multidisciplinary nature of One Health, we encourage students to work in teams of 2-3 students as you get to know each other and if logistics permit. However, if that is not possible, students are welcome to take advantage of this opportunity on an individual basis. The list of topics, and other details on this case study are

provided in an accompanying document.

CLASS SCHEDULE: SEE THE LAST PAGE OF SYLLABUS FOR THE CLASS SCHEDULE.

GRADING OPPORTUNITIES:

This course is offered on a standard graded basis. The instructor will provide evaluation-grading rubrics (based on the course learning objectives) in advance for all major assignments. Grading guidelines are adapted from Department of Health Services guidelines: [link]

3.9---4.0. *Excellent and exceptional work...for a graduate student*

Work at this level is unusually thorough, well-reasoned, sophisticated, and well-written. Work shows an incisive understanding of issues, and demonstrates clear recognition of appropriate approaches to address problems and questions.

3.7---3.8. *Strong work...*

Work at this level is thorough and well-reasoned, indicates strong understanding of appropriate approaches to address problems and questions, and demonstrates clear recognition and good understanding of salient issues and problems.

3.4---3.6. *Competent and sound work...*

Work at this level is thorough and well-reasoned, and shows sound understanding of appropriate approaches to address problems and questions. Shows adequate understanding of issues and problems. Minor misunderstandings or errors may (or may not) be present.

3.2---3.3. *Adequate work..., although some weaknesses are evident*

Work at this level is moderately thorough and well-reasoned, but understanding of the important issues is less than complete. Approaches to address problems and questions are generally adequate, however the work has one or more weaknesses or limitations.

2.9---3.1. *Borderline work...*

Work at this level meets minimal expectations. Understanding of salient issues is incomplete. Approaches to address problems and questions are minimally adequate. The work has substantial weaknesses or limitations.

2.7---2.8. *Deficient but acceptable work...*

Work at this level does not meet minimal expectations. Work is inadequately developed or flawed by numerous errors and misunderstanding of important issues. Approaches to address problems and questions are weak and fail to demonstrate the expected knowledge or competence.

<2.7 *Unacceptable work...*

Work below this level is graded relative to performance expected for an undergraduate student. See these two UW web pages for information (student guide; faculty resource).

Participation Expectations:

Excellent (4.0): full and consistent preparation and completion of readings ahead of class, class attendance and active participation in class discussions

Adequate (3.0): full and consistent preparation and completion of readings ahead of class; regular class attendance and frequent participation in discussions

Borderline (2.5): irregular preparation and completion of readings ahead of class, inconsistent class attendance, less active participation in discussions

Unacceptable: minimal to no preparation and failure to complete readings ahead of class, minimal class attendance, minimal to no participation in team discussions

Undergraduate Level (439) expectations:

Class Participation in lectures (10%):

Students may earn class participation credits by participating in classroom discussions during lectures (asking and answering questions).

Participation in team problem-solving sessions (50% in total- see following breakdown): Students will be judged on their degree and excellence of preparation for and participation in team problem-solving sessions in the following way:

- 35%: Grade for team problem-solving exercise write-ups
- 15%: Participation evaluation: 439 students will be evaluated by the graduate student team leader(s) on the basis of their preparation for (completion of readings, submission of bulleted talking points for their presentations) and level of participation in team problem-solving sessions and write-ups. More detail on peer evaluation will be provided during the first week of class and again, at the time of problem-solving discussion exercises.

Midterm Exam (15%):

The midterm exam will be a one-hour timed, open-book examination administered on Canvas. The exam site will be open for 48 hours, during which students will have one hour to complete the exam. Students are expected to work independently on this exam.

Final Exam (25%):

The final exam will also be a timed, open-book examination administered on Canvas. Students are expected to work independently on this exam.

Graduate Level (539) work expectations:

Class Participation in lectures (10%):

Students may earn class participation credits by participating in lecture associated classroom discussions (adding experiences, asking and answering questions).

Participation and leadership in team problem-solving (50% in total—see following breakdown):

Graduate student team leaders will be judged on their degree and excellence of participation in group problem-solving in the following way:

- 30%: Grade for team problem-solving exercise write-ups (see sections above)
- 10% for planetary health contributions to problem-solving case studies
- 10%: Participation evaluation: 539 students will be evaluated on the quality of their leadership/facilitation skills for the group problem-solving exercises. This evaluation will be provided by undergraduate student group members and course instructors. More detail on peer evaluation will be provided during the first week of class.

Midterm Exam (15%):

The midterm exam will be a timed, open-book examination administered on Canvas. The exam

site will be open for 48 hours, during which students will have one hour to complete the exam. Students are expected to work independently on this exam.

Final Exam (25%):

The final exam will also be a timed, open-book examination administered on Canvas. Students are expected to work independently on this exam.

ACADEMIC INTEGRITY

Students at the University of Washington are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the SPH Academic Integrity Policy. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.

ACCESS AND ACCOMMODATIONS

The student experience in this class is important to the instructors. An important policy and practice of the University of Washington is to create inclusive and accessible learning environments consistent with federal and state law.

Students are asked and expected to establish accommodations with the Disability Resources for Students (DRS--at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu), and then communicate all approved accommodations to Dr. Marguerite Pappaioanou, at the earliest opportunity. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between the student, instructor and DRS. Qualifying conditions could include but are not limited to mental health, attention-related disabilities, learning disabilities, vision, hearing, physical or health impacts.

Upon learning of approved accommodations by DRS, we can discuss student needs in this course. If students have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations, students are encouraged to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu, as soon as possible.

ADDITIONAL COURSE GUIDELINES

1. Come to class; arrive on time, and please let Marguerite Pappaioanou know ahead of time if you cannot make it.
2. Come to lectures and team problem-solving sessions prepared and with questions about the topic/reading material. Preparation includes completing assigned readings, and submitting bulleted talking points you will use in your presentations during One Health team problem-solving sessions

to your team leader before the start of each session.

3. Work effectively with your small group / One Health team to prepare group problem-solving presentations and reports.
4. Note that the use of computers, tablets, smart phones will not be permitted during problem-solving exercises, except for graduate student team leaders who may use a computer to take discussion notes for summary reports.
5. Food and drinks are welcome (but please keep it quiet)
6. Be courteous, refrain from unnecessary talking, reading newspapers,
7. Share relevant experiences, perspectives, ASK QUESTIONS
8. Let Marguerite Pappaioanou know how we are doing (if we are moving too fast, not being clear, or otherwise not getting the message across, we need to know.)

Week	Date	Day	Module	Lecture topic	Lecturer	Homework/Due
1	26-Mar	M	Intro to One Health	<i>Welcome to Course; Course Logistics</i>	Rabinowitz and Pappaioanou	
				Lecture: Introduction to and Overview of One Health (includes Planetary Health)		
	28-Mar	W	Intro to One Health	Lecture: One Health Implementation/ Practice Models; Competency domains, Evaluation/ outcomes; Barriers to One Health	Pappaioanou	Required reading
Lecture: Anthropologic and economics aspects of One Health				Ramirez		
2	2-Apr	M	Intro to One Health	<i>Problem-solving exercise: One Health Antimicrobial Resistance (Introduction, HAE presentations, integration)</i>	Rabinowitz and Pappaioanou	Required reading Team Preparation: Bulleted talking points
	4-Apr	W	Intro to One Health	Optional Self-Study for Extra Credit. Anthropologic and other One Health Aspects Of Investigating A Possible Foodborne Disease Outbreak Tied To Fruit Bat Consumption	Self-Study	No homework due;
3	9-Apr	M	Zoonoses	Lecture: Overview of zoonoses; routes of transmission; interventions for prevention and control.	Pappaioanou	Required reading Write-up for Antimicrobial Resistance Due
				Influenza: Avian, Swine, Human Seasonal /Pandemic Influenza;		
				Problem Solving Exercise: Preventing the next Influenza pandemic-- Introduction		
	11-Apr	W	Zoonoses	<i>Problem Solving Exercise: Preventing the next Influenza pandemic</i>	Pappaioanou	Required reading

Week	Date	Day	Module	Lecture topic	Lecturer	Homework/Due
						Team Preparation
4	16-Apr	M	Zoonoses	<i>Lecture: Lecture: Bacterial zoonoses (Brucellosis, Q fever etc.)</i>	Colby	Team preparation Write-up for Influenza due
				<i>Food Borne Illness: Surveillance, prevention, outbreak investigation:</i>	Pappaioanou	
				<i>Problem-solving exercise: Foodborne Outbreak of E. coli O157, introduction</i>		
	18-Apr	W	Zoonoses	<i>Problem-solving exercise: E. coli O157, group work (HAE presentations, integration)</i>	Pappaioanou Jay-Russell	Required reading Team preparation
5	23-Apr	M	Zoonoses	Lecture: Conservation Medicine	Garland-Lewis Pappaioanou	Required reading Write-up for E coli case due
				<i>Problem-solving exercise: Conservation medicine, introduction</i>	Garland-Lewis Ramirez	
		25-Apr	W	Zoonoses	<i>Problem-solving exercise: Conservation medicine, team work (HAE presentations ,integration)</i>	Garland-Lewis Ramirez
6	30-April	M	Human Animal Medicine	<i>Lecture: Zoobiquity; Gut Microbiome; Human and animal immunity, dairy farmers, Peruvians (30 min)</i>	Rabinowitz	Required Readings
				<i>Lecture: Zoobiquity: Skin Microbiome, canine/human (30 min)</i>	Gardner	
				<i>Problem-solving exercise: Dog-human skin</i>		

Week	Date	Day	Module	Lecture topic	Lecturer	Homework/Due
				microbiome, introduction (20 min)		
	2-May	W	Human Animal Medicine	<i>Problem-solving exercise: Dog-human skin microbiome, group work (HAE presentations, integration)</i>	Rabinowitz Gardner	Required reading- Team Preparation
7	7-May	M	Animal Sentinels	Lecture: Introduction to and overview of Animal Sentinels (30 minutes)	Pappaioanou	Required reading Write-up for Skin microbiome case due
				Lecture: Arthropod and Rodent Vectors ; as sentinels (30 minutes)	Dykstra	
				<i>Problem-solving exercise: Coccidioidomycosis, introduction (20 minutes)</i>	Meisner	
	9-May	W	Animal Sentinels	Lecture: Other Sentinels; Coccidioidomycosis in WA	Pappaioanou Wohrle, Oltean (Invited)	Required Reading
<i>Problem-solving exercise: Coccidioidomycosis, team work (HAE presentations, integration)</i>				Wohrle, Oltean Meisner	Team Preparation	
8	14-May	M	Human Animal Bond	Lecture: Introduction to One Health Aspects of the Human Animal Bond	Garland-Lewis Thompson-Iritani	Required reading
				<i>Problem-solving exercise: Homeless people and pets; introduction</i>	Garland-Lewis	Write-up for Coccidioidomycosis case due
	16-May	W	Human Animal Bond	<i>Problem-solving exercise: Homeless people and pets, HAE presentations,</i>	Garland-Lewis Graves,	Required reading Team preparation

Week	Date	Day	Module	Lecture topic	Lecturer	Homework/Due
				integration, team work	Rep, mobile medical van (TBD)	Write-up for homeless case due
9	21-May	M	Human-Animal Bond	Pet partners Animal therapy visit	Callahan Pappaioanou	Required reading Write-up for homeless case due
	23-May	W	Emergency Preparedness and Response	Lecture: Introduction to Emergency Preparedness and Response (natural disaster, pandemic)	Pappaioanou	Required Reading
WA: Emergency preparedness and response				TBD		
10	28-May	M		Memorial Day NO CLASS		
10	30-May	W	Emergency Preparedness and Response	In-class interactive case exercise for Emergency Preparedness/Response	Pappaioanou	Required Reading Team Preparation
	4-Jun	M		Exam week- final exam	Pappaioanou	All self-study extra credit (zoo) write-ups due