One Health Intellectual Exchange Group Course:
Philosophy to Practical Integration of Human, Animal, and Environmental Health

Spring Semester 2017

Cross-listed at Duke (ENV 774/GLHLTH 771), NCSU (CBS 595, Section 5/VMP 986), and UNC (PUBH 705 Section 001/ ENVR 890 section 003)

Tuesdays, 5:30-7:30 pm
North Carolina Biotechnology Center

COURSE INSTRUCTORS:

DUKE
Dr. Christopher Woods, MD, MPH
Trent Hall, Room 108, 919-451-9795
woods004@mc.duke.edu

Dr. William Pan, DrPH, MS, MPH
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UNC
Mamie Sackey Harris, MS, MPH
UNC IGHID, 2nd Floor Bioinformatics Bldg., 919-452-6570.
msharris@med.unc.edu

Dr. Jill Stewart, PhD
1301 Michael Hooker Research Center, 919-966-7553.
Jill.stewart@unc.edu

NCSU
Dr. Suzanne Kennedy-Stoskopf, DVM, PhD, Diplomate ACZM
246 CVM Main Building, 919-515-8111
suzanne_stoskopf@ncsu.edu

Dr. Peter Cowen DVM, PhD
C 337, College of Veterinary Medicine, 919-513-6321.
peter_cowen@ncsu.edu

Dr. Julie Casani (Pierson) MD, MPH
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COURSE TA:
Bryan Brown PhD Candidate (Duke - Nicholas School of the Environment)
bryan.brown@duke.edu

Office hours: by Email appointment with TA or any course instructor.

Course URLs: https://www.unc.edu/sakai/, Twitter: @NC_OneHealth
http://nconehealthcollaborative.weebly.com

COURSE OVERVIEW: This interdisciplinary course will introduce the concept of One Health as an increasingly important approach to a holistic understanding of the promotion and maintenance of human, animal, and environmental health. Among the topics covered are bidirectional impacts between human health and animal health, the impact of earth’s changing ecology on health, issues of food and water security, emergency preparedness, and the benefits of comparative medicine. The course format is a weekly multi-campus discussion-based seminar held off-site at NC Biotechnology Center. The course aims to include students from Duke, UNC and NC State from diverse disciplines relevant to One Health, including: human medicine, veterinary medicine, environmental science, public health, global health, public policy, and others.
COURSE OBJECTIVES: Learning objectives include 1) describe how different disciplines contribute to the practice of One Health, 2) discuss how interdisciplinary interventions can improve Global Health using a One Health model, and 3) interact with One Health-relevant professionals in the Triangle and beyond.

COURSE REQUIREMENTS: No pre-requisites. Senior level undergraduates may take the course with the permission of a course coordinator from their university.

ATTENDANCE & PARTICIPATION: Attendance is mandatory for students taking the course for credit. Students are expected to attend and actively participate in class unless they have previously arranged with their institutional instructor for an excused absence (e.g. working out-of-state, at a meeting, etc.) or have a personal or family emergency that can be verified. All absences must be cleared by Dr. William Pan for Duke students, Mamie Sackey Harris for UNC students and Dr. Kennedy-Stoskopf, Dr. Julie Casani, or Dr. Peter Cowen for NC State students. Examples of excused absences can be found at http://policies.ncsu.edu/regulation/reg-02-20-03. Attendance will be taken by a sign-up sheet at the start of class.

COURSE READINGS: All course readings will be posted on the course Sakai site under the “Resources” folder. Students are expected to familiarize themselves with any assigned readings before class.

COURSE EVALUATION: This class is offered for variable credit depending on course work assignments and individual university expectations. NC State veterinary students will be graded under VMP 986 criteria on a separate syllabus.

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<td>Class Attendance</td>
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<td>One Health Critical Issues discussion</td>
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<td>Research Topic Outline &amp; Final Paper</td>
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<td>**Critical issue in One Health Essay</td>
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<td>Reflection Paper</td>
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All students will attend the weekly Tuesday evening lecture series conducted at the North Carolina Biotechnical Center in Research Triangle. The lecture series is composed of invited subject matter experts from selected fields of one health practice namely: environmental health and ecology, zoonosis and emerging infectious diseases, food and water safety, the human and animal bond, comparative medicine, one health policy, and disease surveillance and informatics. Students will be required to participate in a One Health critical issue discussion consisting of small (3 student) inter-disciplinary cross campus teams. Each team will research, present on and then lead a class wide discussion on the assigned critical issue. These sessions will be structured as an informal time in which students can share their thoughts and ideas while getting feedback from faculty, peers and guest experts. Finally all students will submit a 2-3 page (double-spaced)
essay reflecting on their observations on how their experience and new knowledge about the One Health framework impacts on their career choices.

Students taking the class for 2 and 3 credits will also submit a final research paper on a self-selected topic in One Health. (See a description of the final paper on page 4 of the syllabus).

*Three (3) Credits only:*

Students taking the class for 3 credits attend a one hour discussion on Thursdays 8:15 – 9:15 am, hosted at each university and connected by video-teleconference at the following locations: Duke Campus (*Duke Brodie Virtual Conference Room*) UNC Chapel Hill (*Michael Hooker Research Center - Room 1001, Gillings School of Global Public Health*) and NC State (*location TBA*). Each student will be assigned to lead a morning discussion session by briefly summarizing the current week's lecture, demonstrate connections to previous lectures, briefly highlight the human, animal and environmental issues, the global and local health impacts and the benefits of multidisciplinary collaboration. The student lead will provide for the group, one additional academic reading relevant to the week's topic. The student will also present a current “One Health in the News” update, which will consist of a 10-15 minute informal description of any current and noteworthy One Health event. This may consist of a One Health item in the news, general media, journal article, or a One Health event such as a conference.

*(Note: NC State students taking this course for 3 credits must also enroll in CBS 610, otherwise, NC State students in CBS 595 are graded under the Two Credit rubric)*

** One (1) Credit only:**

Students taking the class for 1 credit (offered only at UNC) must attend a minimum of 10 lectures (as approved by the course instructor) that includes, the first and last lectures, and one of the special March 7th or 14th spring break sessions (see lecture schedule). In place of the final research paper, these students will write a 4 page, essay on a current global or domestic health issue of their choice and the importance of having a One Health systems approach.

GRADING: Course instructors from the three universities will be responsible for grading.

Duke and UNC undergraduate students will be graded on the A, B, C, D, F scale.

NC State undergraduate and graduate students will be graded on the A, B, C, D (+ or -), F scale.

Duke graduate students will be graded on the A, B, C (+ or -), F scale.

UNC graduate students will be graded on the High Pass (H), Pass (P), and Low Pass (L) scale.

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A+ &= 97 – 100; \quad A &= 93-96.9; \quad A- &= 90-92.9 \\
B+ &= 87 – 89.9; \quad B &= 83-86.9; \quad B- &= 80-82.9 \\
C+ &= 77 – 79.9; \quad C &= 73-76.9; \quad C- &= 70-72.9 \\
D+ &= 67 – 69.9; \quad D &= 63-66.9; \quad D- &= 60-62.9 \\
F &= < 60
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H, P, L Scale:

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\begin{align*}
H &= 90 – 100 \\
P &= 80 – 89.9 \\
L &= 70 – 79.9
\end{align*}
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STUDENTS WITH DISABILITIES: Reasonable accommodations will be made for students with verifiable disabilities. Please contact the course TA for additional information.
ASSIGNMENTS - (DESCRIPTION & GUIDELINES)

Course Readings: All course readings will be posted on Sakai under the “Resources” folder. Students are expected to familiarize themselves with readings before class.

One Health Critical Issues Discussion (All Students):
All students will be required to participate in a one health critical issues discussion consisting of small (3 student) cross-campus interdisciplinary teams. Each team will research, present on and then lead a class wide discussion on their assigned critical issue. The critical issues discussion will occur in the last 30 minutes of select Tuesday class lectures and will not be open to the public (see course Sakai site for specific dates assigned to each team). These discussion sessions have been structured as an informal time where students can share their thoughts and ideas whilst getting helpful feedback from faculty, peers and guest experts. The objective of the critical issues discussion is to stimulate transdisciplinary thinking and analysis.

Final Research Paper (30 points):
Choose a One Health topic of current importance or relevance - the topic must be approved by a course instructor. Research the topic and write a paper (9-10 pages double spaced) clearly describing the One Health relevance of the topic and current progress on the topic. Include in your discussion the socio-economic, cultural, and ethical relevance of the topic and the importance to having a One Health approach in solving the issue. Conclude with lessons learned and recommendations for the way forward in addressing this issue and achieving a One Health solution - see topic examples on page 5 of the syllabus. See Sakai site for the final paper grade rubric.

Final Paper topic justification and outline (10 points):
Briefly state the importance and rationale for the topic chosen and the One Health relevance of the topic (i.e. the human, animal and environmental dynamics). Include a 1 to 2 page outline that captures all sections of the final paper. The outline should be a close approximation of the structure of your final paper. See the course Sakai site for a detailed description.

One Health Critical Issues Essay (30 points) – One (1) credit students only:
Students taking the class for 1 credit are exempt from writing the final paper. One credit students will instead write a four (4) page double -spaced essay, on a current global or domestic health issue of their choice. The essay should explain the human, animal and environmental health perspectives of the issue and the benefits of a having a multidisciplinary and collaborative one health systems approach. The essay should include a brief introductory paragraph with a well-crafted one sentence thesis statement. See the course Sakai site for the essay format and grade rubric.

Reflection Essay (All students):
• Discuss what insights, inspirations, new knowledge, etc. you will be taking away from this course.
• Questions you may wish to consider:
  o What does One Health mean to you?
  o What is your perspective on the importance of One Health?
What potential impact will your knowledge of One Health have on your career path?
What did you learn about One Health from this class that you were not expecting?

Final Paper - Topic examples:
These examples have been selected to demonstrate the breadth of potential topics. Students should select their topic with prior approval by a course instructor.

- Environmental Health/Ecology
  - Environmental drivers of tick populations
  - Harmful algal blooms associated with either brevotoxin or domoic acid exposures
  - Palm oil plantations in Indonesia
- The Human and Companion Animal Bond: The Tie that Binds
  - Pets as sentinels of domestic violence
  - Use of animals for therapy
- Zoonosis and Emerging Infectious Diseases
  - Toxoplasmosis
  - Multidrug resistant tuberculosis
- Food/Water Safety
  - Cryptosporidiosis
  - Norovirus and shellfish safety
- Disease Surveillance, Informatics, Disaster Preparedness
  - Global zoonotic disease surveillance
  - Wildlife/environmental radiation exposure in a disaster (e.g. Chernobyl vs. Japan)
- Benefits of Comparative Medicine
  - Regenerative Medicine: stem cell transplant applications
  - Armadillos and the search for a cure for leprosy

Assignment Due Dates: All assignments should be submitted in drop box on Sakai.

Final Paper Topic Justification & Outline: Monday 20th February - Topic justification & paper outline posted on Sakai by 11:50pm.

Final Paper: Monday 17th April – Final paper posted on Sakai by 11:50pm.

Critical Issue in One Health Essay (for 1 credit students only): Monday 17th April - One Health Essay posted on Sakai by 11:50pm.

Reflection Essay (all students): Monday 24th April - Reflection essay posted on Sakai by 11:50pm.
MODULE 1: INTRODUCTION TO ONE HEALTH

Jan 17  What is One Health? - Introduction to One Health
Course Faculty: Brief welcome and Introduction to the concept of One Health.

Climate Change.
John Balbus, MPH, MD. Senior Advisor for Public Health and Director, NIEHS-WHO Collaborating Centre for Environmental Health Sciences.

Course/Syllabus review with Students 7:00 – 7:30pm

MODULE 2: ENVIRONMENTAL HEALTH / ECOLOGY

Jan 24  BP Oil Spill and Environmental Impacts.
Richard Kwok, PhD. Lead Associate Investigator Epidemiology Branch and Lead Associate Investigator for the GULF STUDY.

AND

BP Oil Spill - Impact on Sea Turtles.
Craig Harms, DVM, PhD, DACZM. Professor, Aquatic Animal Health, Department of Clinical Sciences, North Carolina State University, College of Veterinary Medicine.

Jan 31  Landscape Ecology Impacts on Disease.
Mike Emch, PhD. Professor of epidemiology, Professor and chair of the Department of Geography, University of North Carolina at Chapel Hill

Class Discussion

MODULE 3: ZOONOSES AND EMERGING INFECTIOUS DISEASES

Feb 7  Zika Panel Discussion.
Aravinda de Silva, PhD, Professor Microbiology and Immunology, UNC School of Medicine. Elizabeth Stringer, MD, MSc. Associate professor of maternal-fetal medicine at UNC OB-GYN, Michael H. Reiskind, MPH, PhD, Assistant Professor of Entomology (NCSU).

Feb 14  Emerging Zoonosis
Chris Woods MPH, MD. Professor, Departments of Medicine and Pathology at Duke University, Co-Director of the Hubert-Yeargan Center for Global Health and Chief, Infectious Diseases Division, Durham VA Medical Center.
AND
Peter Cowen, DVM, PhD, DAVES. Associate Professor, Epidemiology and Public Health.

Class discussion

1st ASSIGNMENT DUE -- Final Topic Justification and Outline – Feb 20th @ 11:50 pm

MODULE 4: THE HUMAN AND ANIMAL BOND: THE TIE THAT BINDS

Feb 21 Human-Animal, Relationships, Reconsidered.
Jeannine Moga, MA, MSW, LCSW, Clinical and veterinary social worker at North Carolina State University.

Class Discussion

MODULE 5: FOOD AND WATER SAFETY

Feb 28 Antimicrobial Resistance.
Mark D. Sobsey, PhD. Kenan Distinguished Professor of Environmental Sciences and Engineering, UNC Gillings School of Global Public Health.

Class discussion.

SPRING BREAK SESSIONS - MARCH 7TH AND 14TH

March 7 One Health Case Study (NCSU main campus spring break)
March 14 One Health Case Study (UNC / Duke spring break)

*Brucella suis*: A re-emerging pathogen at the human, livestock, and wildlife interface. An interactive case study exploring responses to feral swine crop damage and *B. suis* spillover. Active audience participation led by One Health Faculty from NC State, UNC-CH, and Duke.

MODULE 5: FOOD AND WATER SECURITY

March 21 Oyster Restoration and Sustainable Fisheries.
David Eggleston, PhD. Professor of Marine Sciences (NC State) and Director, Center for Marine Sciences and Technology.

Class discussion.
MODULE 6: BENEFITS OF COMPARATIVE MEDICINE

March 28  Prosthetics in Dogs and Humans.
Denis Marcellin-Little, DEDV, DACVS, DECVS, DACVSMR. Professor, Orthopedic Surgery, NCSU.

Class Discussion.

NEW MODULE 7: IMPORTANCE OF A BUSINESS APPROACH & POLICY MAKING IN ONE HEALTH

April 4  Panel discussion - Details To be confirmed.

MODULE 8: DISEASE SURVEILLANCE, INFORMATICS, AND DISASTER PREPAREDNESS

April 11  Screwworms in Livestock and Wildlife in Florida.
Barry Meade, EIS graduate/NC area veterinarian
AND
Practical Aspects of Species Conservation in Poultry.
Julie Gauthier, DVM, MPH, Dipl. ACVPM. Author of Chicken Health for Dummies.

Class Discussion

2nd ASSIGNMENT DUE -- Final Paper (2 & 3 credit students) and One Health Essay (1 credit students) - April 17th @ 11:50 pm

April 18  One Health Harmful Algal Blooms.
Lorrie Backer, MPH, PhD. CDC/NCEH, OHHABS EPI/Surveillance
http://www.cdc.gov/habs/ohhabs.html

Class Discussion

3rd ASSIGNMENT DUE -- Reflection Paper – April 24th @ 11:50 pm

MODULE 8: ONE HEALTH IN THE BIGGER PICTURE: POLICY, EDUCATION, CONCLUSIONS

April 25  Title to be confirmed. Capstone Lecture.
David Blazes, MD, MPH. Bill and Melinda Gates Foundation.

Course wrap up with students. 7:00 – 7:30pm