

**One Health Intellectual Exchange Group Course:
Philosophy to Practical Integration of Human, Animal, and Environmental Health**
Fall Semester 2018
Cross-listed at Duke (ENV 774/GLHLTH 771),
NCSU (CBS 595, Section 5/VMP 986), and UNC (PUBH 705 / ENVR 705)
Tuesdays, 5:00-7:00 pm
North Carolina Biotechnology Center

ATTENTION: NEW CLASS DATE - MONDAYS 5:00pm -7:00pm - STARTING FALL 2019!!

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
227 Trent Hall and A355 LSRC, 919-684-4108
william.pan@duke.edu

UNC

Mamie Sackey Harris, MS, MPH
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
jppierso@ncsu.edu

COURSE TA:

To be confirmed

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.

COURSE FORMAT: Weekly multi-campus discussion-based seminar held off-site at NC Biotechnology Center. Lecture discussions by experts in one health and global health including panel discussions, case studies and group discussions. Student's responsibilities include timely completion of assigned readings and coursework plus active participation in small group discussions and activities. We encourage asking questions during class and connecting with guest speakers after class.

COURSE OBJECTIVES:

- To understand how different disciplines contribute to the practice of One Health.

- To analyze and explore how interdisciplinary interventions improve global health using a One Health model.
- To explore contemporary issues, problems and controversies in One Health.
- To engage with One Health professionals within and beyond the NC Triangle.

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 or Dr. Jill Stewart 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>. **A sign-up sheet at the start of class will take attendance.**

COURSE READINGS: Unless otherwise indicated, all course readings will be posted on the course Sakai site under the “Resources” folder. Students should review 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.

	ONE CREDIT	TWO CREDITS	THREE CREDITS
Class Attendance	30 points	20 points	10 points
One Health Critical Issues discussion	15 points	20 points	15 points
Research Topic Outline & Final Paper	n/a	40 points	40 points
*Thursday – One Health discussion	n/a	n/a	15 points
**Critical issue in One Health Essay	30 points	n/a	n/a
Reflection Paper	25 points	20 points	20 points
TOTAL POINTS POSSIBLE	100	100	100

All Duke students, graduate (3 credit) and undergraduate (1 credit), follow the 3-credit requirements

** 3 credit students only (see notes on page 3).*

***1 credit students only (see notes on page 3).*

All students will attend the weekly Tuesday evening lecture series conducted at the North Carolina Biotechnical Center in the Research Triangle. Students will have the option of attending **selected Tuesday lectures** via video conference from UNC Chapel Hill (1305 McGavran-Greenberg Hall, Gillings School of Global Public Health) and Duke Campus (Perkins library Link group study 11). 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 (2-3 student) interdisciplinary cross campus teams. Each team will research, present on and then lead a class wide discussion on the assigned critical issue. These sessions have been structured as an informal time

for students to 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 influences their career choices.

Students taking the class for two and three 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 and all Duke students only:**

Students taking the class for 3 credits attend a one hour discussion on **Thursdays 8:00 – 9:00 am**, hosted at each university and connected by video-conference at the following locations: Duke Campus (*Trent 040*), UNC Chapel Hill (*Rosenau Hall – 230 Fred Mayes Center, 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 multi-disciplinary 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. *See the course Sakai site for assigned dates for student leads.*

Notes: NC State students taking this course for three credits must also enroll in CBS 610, otherwise, NC State students in CBS 595 are graded under the Two Credit rubric.

**** UNC one (1) credit students only:**

UNC Students taking the course for one credit must attend a minimum of 10 lectures including all required lectures. Instead of the final research paper, UNC one (1) credit students write a 4-page, essay on a current global or domestic health issue of their choice, highlighting the human, animal and environmental issues, the global and local health impacts and the benefits of multi-disciplinary collaboration.

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.

A+ = 97 – 100; A = 93-96.9; A- = 90-92.9

B+ = 87 – 89.9; B = 83-86.9; B- = 80-82.9

C+ = 77 – 79.9; C = 73-76.9; C- = 70-72.9

D+ = 67 – 69.9; D = 63-66.9; D- = 60-62.9

F = < 60

H, P, L Scale:

H = 90 – 100

P = 80 – 89.9

L = 70 – 79.9

STUDENTS WITH DISABILITIES: Reasonable accommodations will be made for students with verifiable disabilities. Please contact the course TA for additional information.

ASSIGNMENTS - (DESCRIPTION & GUIDELINES)

One Health Critical Issues Discussion (All students):

The last 30 - 45 minutes of most Tuesday lectures will be reserved for student-led round table discussions with their peers, teaching faculty and the guest presenter. These round table discussions are an opportunity for students to have extended dialogue on the day's topic and will not be open to the public. Students will be grouped in small (2-3 students) cross-campus interdisciplinary teams - see course Sakai site for specific dates assigned to each team. Each team will research, present on and then lead a class wide discussion highlighting one-health issues, questions or concerns related to the day's topic. *In addition*, students also have the opportunity to briefly (~5 minutes) share any **related** One Health information from the popular press, social media (e.g. tabloids, news media, twitter etc.) or from an academic journal article. *The One Health information shared must be related to the topic of the day and is intended as a fun way to bring us up to speed with what is going on locally or globally.* 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. Student leads can structure the discussions how they like. The objective of the critical issues discussion is to stimulate transdisciplinary thinking and analysis. All students are expected to come prepared to participate in these discussions.

One Health Critical Issues Essay (30 points) – UNC one-credit students only:

Students taking the class for one 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 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.*

Final Research Paper (30 points – two and three credit students only):

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 the course Sakai site for the final paper grade rubric.*

Final Paper topic justification and outline (10 points – two and three credit students only):

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 1-2 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.*

Reflection Essay (All students):

Students write a 2-3 page (double-spaced) essay reflecting on their observations on how their experience and new knowledge about the One Health framework influences their career choices.

- Discuss what insights, inspirations, new knowledge, etc. you will be taking away from this course.
- Questions you may wish to consider:
 - What does One Health mean to you?

- 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 brevetoxin 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:

Submit assignments before the deadline in the drop box on Sakai.

October 3 **Final Paper Topic Justification & Outline (2 and 3 credits):** Topic justification and paper outline posted on Sakai by 12 noon.

November 26 **Final Paper (2 and 3 credits):** Final paper posted on Sakai by 11:50pm.

November 26 **Critical Issue in One Health Essay (UNC 1 credit students only):** One Health Essay posted on Sakai by 11:50pm.

December 3 **Reflection Essay (all students):** Reflection essay posted on Sakai by 12 noon.

----- **ONE HEALTH COURSE - LECTURE SCHEDULE Fall Semester 2018** -----
 (Tuesday 5:00pm – 7:00pm)

Dates highlighted in yellow require in-person class attendance at the North Carolina Biotechnology Center (NCBC).

MODULE 1: INTRODUCTION TO ONE HEALTH

Aug 28 **What is One Health? (*NCBC attendance required*)**
Course Faculty: Brief welcome and Introduction to the concept of One Health.

Short faculty presentations on One Health and class discussion.

Course /Syllabus Review with Students 6:15 – 7:00pm

MODULE 2: FOOD AND WATER SAFETY / SECURITY

Sept 4 **Food Policy and One Health (*NCBC attendance required*)**
Kelly Brownell, PhD. Director of the Duke World Food Policy Center & Dean of the Sanford School of Public Policy.

Class Discussion

MODULE 3: ENVIRONMENTAL HEALTH / ECOLOGY

Sept 11 **Urban Heat mapping (climate change) and effects on plants and the environmental health.** (*NCBC attendance preferred, optional remote connection on UNC or Duke campus*).
Elsa Youngsteadt, PhD. Entomologist science writer & Research Associate, NC State University

Class Discussion

Sept 18 **From social networks to ecological networks: How network structure influences disease transmission within and across species.** (*NCBC attendance preferred, optional remote connection on UNC or Duke campus*).
Charles Nunn, PhD. Department of Evolutionary Anthropology & Duke Global Health Institute. Director, Triangle Center for Evolutionary Medicine ([TriCEM](#))
Editor-in-Chief, [Evolution, Medicine and Public Health](#)

Class Discussion

MODULE 2: FOOD AND WATER SAFETY/SECURITY ...continued.

Sept 25 **Water Safety/Security** (*NCBC attendance preferred, optional remote connection on UNC or Duke Campus*)
Antar Jutla, PhD. Department of Civil and Environmental Engineering, University of West Virginia

Class Discussion

MODULE 4: BENEFITS OF COMPARATIVE MEDICINE

Oct 2 **How dogs have helped us understand and treat retinal diseases in people.** (*NCBC attendance preferred, optional remote connection on **Duke campus only***)
Freya Mowat, BVSC. PHD. DIPL. ECVO DIPL. ACVO. Assistant Professor of Ophthalmology, NC State University.

Class Discussion

First ASSIGNMENT DUE -- Final Topic Justification and Outline – October 3rd @ 12noon

NCSU Spring break Oct 4-5 (NCSU students miss Thursday class Oct 4)

Oct 9 NO CLASS (entire week). Duke Spring break

MODULE 5: ZOOSES AND EMERGING INFECTIOUS DISEASES

Oct 16 **Emerging Viral Pathogens.** (*NCBC attendance preferred, optional remote connection on **UNC campus only***)
Gene Olinger, PhD, MBA. Principal Science Advisor, MRI Global –Midwest Research Institute. Key member /inventor in the development of ZMapp Ebola Virus Disease treatment.

Class discussion.

UNC Spring break Oct 17- 19 (UNC Students miss Thursday class Oct 18).

MODULE 6: THE HUMAN AND ANIMAL BOND: THE TIE THAT BINDS

Oct 23 **Perception of pain / pet-assisted therapy.** (*NCBC attendance preferred, optional remote connection on UNC or Duke campus*)
Margaret Gruen, DVM, MVPH, PhD, DACVB. Clinical Assistant Professor, NC State University.

Class Discussion

Oct 30 **One Health Case Study (*NCBC attendance required*)**
***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.

Nov 6 **Young Professionals Panel Discussion: One Health - Benefits and Challenges of One Health in the work place. (*NCBC attendance required*)**

Moderator: Eric Pevzner, MPH PhD. Chief of the CDC Epidemic Intelligence Service (EIS) Program. Eric will also briefly speak on the role of One Health in EIS recruitment opportunities.

Panelists: Chris Koivisto, DVM. Anatomic Pathology Resident and Graduate Research Associate, Ohio State University.

Helena Chapman, MD, MPH, PhD. American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellow at the National Aeronautics and Space Administration (NASA).

Maya Nadimpalli, MS, PhD. Postdoctoral research scientist, Department of Infection and Epidemiology Institut Pasteur.

Chris Pierson, MHS. ‘Challenges of navigating work/careers in One Health.’ (Connecting via video conference.)

Jennifer Niemuth, DVM, Doctoral Candidate. NC State University.

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

Nov 13

Outer Banks, Coastal management and One Health Policy / Economics. (*NCBC attendance required*)

Orrin Pilkey, PhD. James B. Duke Professor Emeritus of Geology, Division of Earth and Ocean Sciences, Nicholas School of the Environment Duke University, and Founder and Director Emeritus, Program for the Study of Developed Shorelines at Western Carolina University.

Susan Stuska, EdD. Wildlife Biologist, Cape Lookout National Seashore - National Park Service.

Paula Gillikin, MS. Nature Reserves Manager, N.C. Coastal Reserve & National Estuarine Research Reserve and Central Sites Manager (Rachel Carson & Permuda Island Reserves) / Environmental Specialist N.C. Department of Environmental Quality.

Nov 20

Journal review Students/Faculty - Review of selected peer reviewed articles on One Health. (*NCBC attendance preferred, optional remote connection on UNC or Duke campus*).

No class on Thursday Nov 22 – Thanksgiving break

Second ASSIGNMENT DUE -- Final Paper (2 & 3 credit students) and One Health Essay (1-credit students)
– Nov 26th @ 11:50 pm

MODULE 8: DISEASE SURVEILLANCE, INFORMATICS, AND DISASTER PREPAREDNESS

Nov 27

Speaker to be confirmed (*NCBC attendance preferred, optional remote connection on UNC or Duke campus*)

Class discussion

Third ASSIGNMENT DUE -- Reflection Paper – December 3rd @ 12 noon

MODULE 9: ONE HEALTH IN THE BIGGER PICTURE: POLICY, EDUCATION, CONCLUSIONS

Dec 4

Capstone Lecture. “The End of Epidemics” (*NCBC attendance required*)

Jonathan Quick, MD, MPH. Management Sciences for Health, Senior Fellow Emeritus, former President and CEO Harvard Medical School, Instructor in Medicine Brigham and Women’s Hospital, Division of Global Health Equity. Author, *The End of Epidemics: The Looming Threat to Humanity and How to Stop It*.

Course wrap up