THE OHIO STATE UNIVERSITY

PUBHEHS 6390– Major Human Diseases in Global Public Health

Instructor: Qinghua Sun

Office location and phone number: Cunz Hall room 424; Tel: 614-247-1560

E-mail: sun.224@osu.edu via Carmen/Canvas

Instructor's Office Hours: Office hours are available to meet in person. If students have general questions or comments regarding the course, please communicate directly via Carmen or email to the instructor. In addition, digital office hours may also be available based on the feedback or need from the students.

Prerequisites: For students matriculated in the graduate and professional degree programs, including admitted non-degree students

Course Delivery: This course is a 100% online distance learning (DL) course from the Division of Environmental Health Sciences in the College of Public Health. The course is hosted on OSU's Carmen (Canvas™) learning course management system (https://carmen.osu.edu/). There are seven weekly and asynchronously delivered course sessions consisting of topic-specific modules of three. Within each module there are a series of chapter-based topics. You can access all of the contents in the Modules from the day the module open. Dates are listed in your syllabus as well as in your Canvas course. This structure allows you to read materials, watch the lectures and complete discussion board postings and lecture self-checks at your own pace. These can be completed at your own pace but must be done by the time the module closes. No exceptions. In addition to the equivalent instruction time per module, there are also corresponding supplemental readings and other materials for review and self-study. Much of the content for the course will include applied short case scenarios/papers from high impact journals for students to complete and self-assessment.

Expectations of Students: This is a completely asynchronous online course (i.e., there are no times at which we all gather in person or virtually). The asynchronous design allows for more flexibility, but it also puts more responsibility on you to effectively manage your time and learning. You should expect to login multiple times per week to the site on Carmen, although most of the work could be done "off-line". It is recommended to download the teaching materials so that you will be able to review them later on. These expectations are further discussed in this syllabus.

Course Description

Medicine is believed to primarily help diagnose, treat and cure individual patients after they have become ill or injured or to help manage already-existing chronic conditions. Public health, however, is focused on preventing illnesses and injuries or intervening to decrease the impact to populations of people. A clinician usually lacks public health-related knowledge while a public health professional usually lacks sufficient understanding of disease pathogenesis and evaluation. This course will integrate medical and public health contents and concepts relative to major human diseases and its public health impact from a global perspective. The course will emphasize basic physiology, pathophysiology and clinical

evaluation of major human diseases that have significant global impact epidemiologically, politically, and economically with the focuses on disease causes and prevention. All the diseases discussed either have a history of global pandemic, or are having the potential to become globally pandemic. It is especially helpful to the students for their research and work in human diseases and its model design with an emphasis on addressing problems that are global or pandemic.

Learning Objectives

Upon completion of this course, students will be better prepared to:

1. Recognize the current major human diseases with global public health impact.
2. Outline the mechanisms of human disease initiation and manifestation.
3. Summarize the basic principles and concepts about disease etiology, epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment, prevention and control.
4. Summarize population-based data on the most common health problems faced by people living in poverty or under specific scenarios.
5. Discuss and debate major factors on human disease initiation, development, and early detection.
6. Summarize possible actions and further research about major human diseases and public health policy impact.

Applicable Foundational Knowledge

1. Explain public health history, philosophy and values
2. ~~Identify the core functions of public health and the 10 Essential Services~~
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health
4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program
5. Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.
6. Explain the critical importance of evidence in advancing public health knowledge
7. Explain effects of environmental factors on a population's health
8. Explain biological and genetic factors that affect a population's health
9. Explain behavioral and psychological factors that affect a population's health
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities
11. Explain how globalization affects global burdens of disease
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (eg, One Health)

Applicable MPH Degree Core Competencies

Evidence-based Approaches to Public Health:

1. Apply epidemiological methods to the breadth of settings and situations in public health practice
2. Select quantitative and qualitative data collection methods appropriate for a given public health context
3. ~~Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate~~
4. Interpret results of data analysis for public health research, policy or practice

Public Health & Health Care Systems:

5. ~~Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings~~
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels

Planning & Management to Promote Health:

~~7. Assess population needs, assets and capacities that affect communities' health~~
8. ~~Apply awareness of cultural values and practices to the design or implementation of public health policies or programs~~
~~9. Design a population-based policy, program, project or intervention~~
~~10. Explain basic principles and tools of budget and resource management~~
~~11. Select methods to evaluate public health programs~~
***Policy in Public Health**:*
~~12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence~~
~~13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes~~
~~14. Advocate for political, social or economic policies and programs that will improve health in diverse populations~~
~~15. Evaluate policies for their impact on public health and health equity~~
Leadership:
~~16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making~~
~~17. Apply negotiation and mediation skills to address organizational or community challenges~~
~~Communication:~~
~~18. Select communication strategies for different audiences and sectors~~
19. Communicate audience-appropriate public health content, both in writing and through oral presentation
~~20. Describe the importance of cultural competence in communicating public health content~~
Interprofessional Practice:
~~21. Perform effectively on interprofessional teams~~
Systems Thinking:
~~22. Apply systems thinking tools to a public health issue~~

MPH-EHS Specialization Competencies
1. Explain the significance of the community and workplace environment to public health;
2. Outline the health challenges that natural and anthropogenic contaminants in the environment can pose to population health;
3. Explain the physiological factors that influence human exposure and the uptake of chemical and biological environmental agents;
4. Identify and explain individual (e.g., genetic, physiologic and psychosocial) and community (e.g., social, built, economic, race) susceptibility factors that heighten the risk for populations for adverse health outcomes from environmental hazards;
5. Apply various risk assessment, risk management and risk communication approaches for environmental hazards;
6. Explain exposure and the underlying mechanisms of toxicity and infectivity resulting from chemical, biological and physical agents;
7. ~~Describe federal and state regulatory programs, guidelines and authorities relevant to environmental and occupational health;~~
~~8. Access state, federal, and local resources for assessing environmental and occupational health;~~
9. Compare the principle components and influencing factors in the exposure continuum from source to disease; and,
10. Determine the role of exposure assessment in environmental and occupational health.

MS-EHS Specialization Competencies
1. ~~Explain how the core public health concepts of biostatistics, epidemiology, environmental health, health behavior/health promotion, and health administration relate to the student's area of specialization~~.
2. Synthesize literature in student's area of specialization relative to their thesis topic and its importance for public health.

3. Summarize relevant theories and conceptual models that inform their research.
4. ~~Conduct a research project using appropriate research methods and ethical approaches~~.
5. ~~Prepare a thesis summarizing the research project and interpreting the results~~.
6. Communicate in writing and orally a research project's methods, results, limitations, conclusions and public health relevance.
7. Explain individual and community susceptibility and vulnerability factors that heighten the risk for populations for adverse health outcomes from environmental hazards.
8. Apply the environmental health paradigm (i.e., EHS Model) to characterizing hazardous physical, chemical and biological agents relative to sources, categories, exposure matrices/pathways, distribution, human exposures, responses, societal/regulatory actions, and technological controls.
~~9. Work with various stakeholders and other professions to proactively and reactively address environmental and occupational regulatory, policy and human health issues and concerns.~~

PhD-EHS Specialization Competencies
1. ~~Explain how the core public health concepts of biostatistics, epidemiology, environmental health, health behavior/health promotion, and health administration relate to the student's area of specialization~~.
2. Synthesize and critique existing literature in student's area of specialization to identify gaps in the evidence base and justify their importance for public health.
3. Apply relevant theories and conceptual models to inform and ground research design and interpretation.
4. Formulate hypotheses, plan and conduct a research study using appropriate research methods, and ethical approaches.
5. ~~Analyze data and prepare an original manuscript, suitable for publication, summarizing the results and interpreting the findings from a research study.~~
6. Communicate in writing and orally a research study's purpose, methods, results, limitations, conclusions and public health relevance to both informed and lay audiences.
7. Quantify individual and community susceptibility and vulnerability factors that heighten the risk for populations for adverse health outcomes from environmental hazards.
8. Apply the environmental health paradigm (i.e., EHS Model) to characterizing hazardous physical, chemical and biological agents relative to sources, categories, exposure matrices/pathways, distribution, human exposures, responses, societal/regulatory actions, and technological controls.
9. Work with various stakeholders and other professions to proactively and reactively address environmental and occupational regulatory, policy and human health issues and concerns.

A complete list of College of Public Health Competencies is located in Appendix C of the CPH Graduate Student Handbook that can be found at https://cph.osu.edu/students/graduate/handbooks/

Reading References: This course does not require a specific textbook. Assigned supplemental readings, such as journal articles, digital video clips, and applicable website contents/links, are required in most of the modules. The following is regarded as reference (not required to read before the lecture delivery unless specified otherwise) to facilitate the understanding of the lecture notes and will be available (loaded) in Carmen.
Harrison's Principles of Internal Medicine. New York: McGraw-Hill Medical, 2018. OSU library CALL # RC46 .H333 2018 or Harrison's Principles of Internal Medicine, 20e (free online access via OSU library)

Course Activities and Assignments

1. Lecture self-checks

For each topic taught in this course, you will be required to view a pre-recorded lecture summary, slides, or representative scientific papers. To assess your level of understanding of the lecture topics and contents, you will then be required to complete periodic self-checks. Self-checks are multiple choice type.

2. Question/discussion participation

This class will utilize discussion boards to foster critical thinking skills. You must respond to the prompt questions posted by the instructor in the discussion board. Expectations and posting requirements can be found in the Table of Grading Structure. A guide for creating quality discussion posts can be found in Carmen (Canvas). You are encouraged to post early, but it is understood that this may not always be possible***. In addition to posting, you are required to respond substantively to at least one of your classmates' posts. You are required to post your original reply first before seeing the posts of others***. Everyone is expected to follow the discussion throughout the chapter. It is expected that your level of participation may vary.

3. Final exam

It is a research proposal, which will be available during the university assigned final examination time (extended time).
Research proposal: The goal is to promote innovative thinking and encourage high impact research in global public health by practicing "real world" research proposal drafting and discussion. It is required to write a research proposal by choosing one major human disease in the US that has significant global public health impact and propose a possible future study design in human or in animal model with key components (title, background/introduction, hypothesis, design/methods, expected results, alternative approaches, novelty, public health significance, and references) in minimum 4 pages (single space, font 12; cover page and references page not counted) in Word. The template and rubric for evaluating case studies will also be provided. Detailed instructions about it can be found in Carmen (Canvas).

Our quizzes and exams are open-book and open-notes. You may use any written materials, such as textbooks, printed handouts, homework assignments, or programs. Make-up exams will not be given except in case of a serious emergency for an extended time period since it has already provided some flexibility to the students. If so, you must contact the instructor before the event (or arrange for someone to do so) or as soon as possible. You must show evidence that you are physically unable to participate it, such as a clear and specific doctor's note mentioning the date, exam, and reason. Generally speaking, no make-ups will be granted for personal reasons such as travel, personal hardship, leisure, or to ease test chapter schedules, and no student will be permitted to take an exam beyond the scheduled and already-extended time period. The exceptions may be made at the instructor's discretion.

Other additional assignments may also be announced.

OSU Standard Scheme A-E

Name:	Range:	
A	100 %	to 93.0%
A-	< 93.0 %	to 90.0%
B+	< 90.0 %	to 87.0%
B	< 87.0 %	to 83.0%
B-	< 83.0 %	to 80.0%
C+	< 80.0 %	to 77.0%
C	< 77.0 %	to 73.0%
C-	< 73.0 %	to 70.0%
D+	< 70.0 %	to 67.0%
D	< 67.0 %	to 60.0%
E	< 60.0 %	to 0.0%

Grading Policy

In order to receive credit for the course, participants are encouraged to complete as much as possible of the course activities with satisfactory responses. ***In order to provide students with flexibility to work through content and complete***

assignments, the course is organized by modules of two to three weeks. By giving students two to three weeks to complete the work, students can complete assignments as their schedule allows. Because you have the flexibility to work as your schedule allows no make-ups or extensions will be granted for any missed activity. Quality work is expected from all students. Assignments/activities are to be completed and turned in by the due dates as posted in Carmen (Canvas). All assignment/activity due dates are also visible in the Syllabus section of your Carmen (Canvas) course. Some activities (such as self-checks) will be auto-graded and some activities (such as discussion participation) may be graded periodically or along with the finals.

Table: Grading Structure

Activity	Points counted in overall	Note
Academic integrity	1	Must do within the first week of the semester started (point counted towards final grade). You will not be granted access to the remaining course content until you complete this task.
Lecture self-checks Question/discussion participation Final-case report/research proposal	49 20 30	0.5 points/quiz 1 point/question (0.5 points for original post and 0.2 points for reply post) Word document
Total	100	

Grade scale
Grading is done periodically and final grade will be determined via Carmen based on the overall performance and activity participation. Below table shows as reference according to OSU Registrar's office: ***https://registrar.osu.edu/policies/index.asp*.**

Attendance: Your attendance is required and is based, at least in part, on your online activity and participation using Carmen. Student access to posted course modules and contents will be tracked to ensure there is ongoing access, activity, and productivity.

Time Management: University rules stipulate that a student can expect to spend a minimum of 6 hours per week on a course for each credit hour, thus for this 3 credit hour course you should expect to devote roughly 18 hours per week. Workload will vary from week to week, with some weeks having more assignments and others having more active learning time. This is intended as a rough guide to help you plan your time accordingly. In a typical week, you can expect your time to be spent as follows:

- 3 hour – viewing lectures
- 2 hour - completing online knowledge self-checks
- 6 hour - completing assigned reading and homework assignments, viewing videos assigned to this course. This also includes preparing for research proposal of final exam
- 6 hours - reviewing materials and interacting on discussion boards

Carmen
The lecture notes, additional reading materials, test materials and other notices will be available in Carmen site for the course. You will also use Carmen for other class activities, such as to participate question posting and discussion, quizzes, exams, and submitting case reports. Should you require additional services to use these technologies, please request accommodations with the instructor. HELP DESK call 614-688-HELP at any time if you have a technical problem involving Carmen. Support is available at this number 24/7.

Office of Student Life: Disability Services
Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact the Office of Student Life: Disability Services at 614-292-3307 in Room 098 Baker Hall 113 W. 12th Ave. to coordinate reasonable accommodations for students with documented disabilities (http://www.ods.ohio-state.edu/).

Mental Health Services
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-- 292--5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at 614--292--5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-- 800--273--TALK or at suicidepreventionlifeline.org.

Academic integrity
Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University, the College of Public Health, and the Committee on Academic Misconduct (COAM) expect that all students have read and understood the University's Code of Student Conduct and the School's Student Handbook, and that all students will complete all academic and scholarly assignments with fairness and honesty. The Code of Student Conduct and other information on academic integrity and academic misconduct can be found at the COAM web pages (http://oaa.osu.edu/coam/home.html). Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct, the Student Handbook, and in the syllabi for their courses may constitute "Academic Misconduct."

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Please note that the use of material from the Internet without appropriate acknowledgement and complete citation is plagiarism just as it would be if the source were printed material. Further examples are found in the Student Handbook. Ignorance of the Code of Student Conduct and the Student Handbook is never considered an "excuse" for academic misconduct.

If I suspect a student of academic misconduct in a course, I am obligated by University Rules to report these suspicions to the University's Committee on Academic Misconduct. If COAM determines that the student has violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in the course and suspension or dismissal from the University. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact the instructor.

Course Schedule
Note: please pay attention to the changes in the start day and length for each module due to spring break and final exams.

Module 1: January 6, Monday to January 19, Sunday (timed)

Week 1

Chapter 1: Introduction to Global Issues and Global Health in Medicine: This lecture will introduce some fundamental relationship between global issues, global health and medicine.

References:

1. David Hemenway. Why We Don't Spend Enough on Public Health. N Engl J Med.2010; 362;18:1657-1658
2. Harrison's Principles of Internal Medicine. Part 17: Global Medicine

Assignments: Carmen discussion participation and lecture self-check

Chapter 2: Basics in Human Health/Diseases: This lecture will introduce some basic definitions and knowledge in human health and disease.

References:

1. Harrison's Principles of Internal Medicine. Part 2: Cardinal Manifestations and Presentation of Diseases
2. Sim I. Mobile Devices and Health. N Engl J Med. 2019 Sep 5;381(10):956-968.

Assignments: Carmen discussion participation and lecture self-check

Chapter 3. Environmental Exposures and Diseases: This lecture will summarize new concept of environmental medicine, a multidisciplinary field involving medicine, environmental science, chemistry and others.

References:

1. Harrison's Principles of Internal Medicine. Part 15: Disorders Associated with Environmental Exposures
2. Hurst's The Heart, 13e. Chapter: Environment and Heart Disease
3. Auerbach PS. Physicians and the environment. JAMA. 2008 Feb 27;299(8):956-8

Assignments: Carmen discussion participation and lecture self-check

Week 2

Chapter 4. Occupational and Environmental Lung Disease: This lecture will highlight major inhalational/occupational exposures and respiratory disorders.

References:

1. C. Arden Pope III, et al. Fine-Particulate Air Pollution and Life Expectancy in the United States. N Engl J Med 2009;360:376-86;
2. Robert K. Bush & David B. Peden. Advances in environmental and occupational disorders in 2008. J Allergy Clin Immunol. 2009;123:575-8;
3. Harrison's Principles of Internal Medicine. Chapter 283: Occupational and Environmental Lung Disease

Assignments: Carmen discussion participation and lecture self-check

Chapter 5. Major Global Infectious Diseases - Common Respiratory Infections，STD and AIDS: This lecture will introduce basic considerations in infectious diseases, and summarize common respiratory infections and human immunodeficiency virus disease, such as common cold, influenza, pneumonia, STD and AIDS, and their broad impact internationally.

References:

1. R Rennie, B Crowson. The management of upper respiratory tract infections. J R Nav Med Serv. 2013;99: 97-105.
2. Harrison's Principles of Internal Medicine. Chapter 194, 195, and 197: Common Viral Respiratory Infections; Influenza; Human Immunodeficiency Virus Disease: AIDS and Related Disorders
3. Malani PN. Visions for an AIDS-Free Generation: Red Ribbons of Hope. JAMA. 2016 Jul 12;316(2):154-5.

Assignments: Carmen discussion participation and lecture self-check

Chapter 6. Major Global Infectious Diseases – Tuberculosis: This lecture will introduce tuberculosis with its etiology, epidemiology, pathology and immunity, clinical manifestations, diagnosis, treatment, prevention and control, and its global impact.
References:
1. Catherine Anne Curley. Rule out pulmonary tuberculosis: Clinical and radiographic clues for the internist. Cleve Clin J Med. 2015. 82: 32-38
2. Harrison's Principles of Internal Medicine. Chapter 173: Tuberculosis
Assignments: Carmen discussion participation and lecture self-check

Module 2: January 20, Monday to February 2, Sunday (timed)
Week 3
Chapter 7. Major Global Infectious Diseases – Malaria: This lecture will summarize malaria with its etiology, pathogenesis, epidemiology, host response, clinical features, chronic complications, diagnosis, treatment, and prevention, and its global health and other impacts.
References:
1. Lesho E, et al. Fever in a returned traveler. Cleve Clin J Med. 2005.72:921-927
2. Harrison's Principles of Internal Medicine. Chapter 219: Malaria
Assignments: Carmen discussion participation and lecture self-check

Chapter 8. Major Global Diseases - Malnutrition and Diarrhea: This lecture will introduce basic consideration in nutrition and associated diseases in malnutrition. It will also summarize common types of diarrheas with its etiology, pathogenesis, epidemiology, clinical features, chronic complications, diagnosis, treatment, and prevention, and its global health and other impacts.
References:
1. Walker CL, et al. Global burden of childhood pneumonia and diarrhea. Lancet. 2013;381:1405-16
2. Harrison's Principles of Internal Medicine. Chapter 128: Acute Infectious Diarrheal Diseases and Bacterial Food Poisoning, and Chapter 327: Malnutrition and Nutritional Assessment
Assignments: Carmen discussion participation and lecture self-check

Chapter 9. Major Global Non-Infectious Diseases - Major Respiratory Diseases-1: This lecture will introduce basic biology of respiratory system, and focus on some major respiratory diseases, such as asthma and chronic obstructive pulmonary disease (COPD).
References:
1. Fung V, et al. Financial barriers to care among low-income children with asthma: health care reform implications. JAMA Pediatr. 2014;168:649-56.
2. Harrison's Principles of Internal Medicine. Chapter 281 and 286: Asthma and COPD
Assignments: Carmen discussion participation and lecture self-check

Week 4
Chapter 10. Major Global Non-Infectious Diseases - Major Respiratory Diseases-2: This lecture will focus on some major respiratory diseases, such as cystic fibrosis and sleep apnea.
Reference:

1. Harrison's Principles of Internal Medicine. Chapter 285 and 291: Cystic Fibrosis and Sleep Apnea
2. Drazen JM. Sleep apnea syndrome. N Engl J Med. 2002 Feb 7;346(6):390.
Assignments: Carmen discussion participation and lecture self-check

Chapter 11. Major Global Non-Infectious Diseases - Cardiovascular Diseases-1: This lecture will introduce basic biology of cardiovascular system, and focus on cardiovascular diseases, such as atherosclerosis and hypertension
References:
1. Estruch R, et al. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts. N Engl J Med. 2018;378(25):e34
2. Harrison's Principles of Internal Medicine. Chapter 232 and 233: Basic Biology of the Cardiovascular System and Epidemiology of Cardiovascular Disease; Chapter 267: Ischemic Heart Disease and Chapter 271: Hypertensive Vascular Disease
Assignments: Carmen discussion participation and lecture self-check

Chapter 12. Major Global Non-Infectious Diseases - Cardiovascular Diseases-2: This lecture will focus on vascular disease in the brain, such as stroke
References:
1. Chen R, et al. Both low and high temperature may increase the risk of stroke mortality. Neurology. 2013;81: 1064-70
2. Harrison's Principles of Internal Medicine. Chapter 419: Cerebrovascular Diseases, Chapter 420: Ischemic Stroke and Chapter 421: Intracranial Hemorrhage
Assignments: Carmen discussion participation and lecture self-check

Module 3: February 3, Monday to February 24, Monday (including final exams, timed)
Week 5
Chapter 13. How to write a hypothesis-based/driven research proposal
To practice how to write a hypothesis-based research proposal and facilitate the design and drafting, a hypothesis/driven research proposal example along with two research papers published in high impact journals on human and animals will be presented to facilitate the final research proposal assignment.
Papers:
1. Aaron M. Cypess, et al. Identification and Importance of Brown Adipose Tissue in Adult Humans. N Engl J Med 2009;360:1509-17
2. Sun Q, et al. Long-term air pollution exposure and acceleration of atherosclerosis and vascular inflammation in an animal model. JAMA. 2005;294:3003-10
3. Example-Research proposal-animal
Assignments: Design and draft research proposal

Chapter 14. Major Global Non-Infectious Diseases - Major Disorders in Endocrinology and Metabolism: This lecture will introduce principles of endocrinology and focus on thyroid disorders, diabetes mellitus and Metabolic Syndrome.
References:
1. Harrison's Principles of Internal Medicine. Chapter 369: Approach to the Patient with Endocrine Disorders; Chapter 376: Hypothyroidism; Chapter 377: Hyperthyroidism; Section 3: Obesity, Diabetes Mellitus, and Metabolic Syndrome
2. Pittas AG, et al. Vitamin D Supplementation and Prevention of Type 2 Diabetes. N Engl J Med. 2019;381:520-530

3. Alberti KG, et al. The metabolic syndrome--a new worldwide definition. Lancet. 2005;366:1059-62
Assignments: Carmen discussion participation and lecture self-check

Chapter 15. Major Global Non-Infectious Diseases - Major Neurologic Disorders: This lecture will introduce nervous system and its major disorders that we are facing globally, especially in developed countries, such as neurodegenerative disorders, psychiatric and addiction disorders, such as alcoholism and drug dependency.
References:
1. Alzheimer's Disease. Nature.2011 Vol. 475 No. 7355_supp ppS1-S22 (6 papers) focusing on “Dementia: A problem for our age”, S2-4
2. Harrison's Principles of Internal Medicine. Chapter 417: Pathobiology of Neurologic Diseases and Chapter 423-426: Alzheimer’s Disease and Dementia; Section 5: Psychiatric and Addiction Disorders
Assignments: Carmen discussion participation and lecture self-check

Week 6
Chapter 16. Major Global Non-Infectious Diseases - Hematopoietic Disorders: This lecture will introduce biology of blood and focuses on major hematopoietic disorders, such as anemia and leukemia.
Reference:
1. Harrison's Principles of Internal Medicine. Part 4: Oncology and Hematology; Section 2: Hematopoietic Disorders
2. Wiemels J. Perspectives on the causes of childhood leukemia. Chem Biol Interact. 2012;196:59-67
Assignments: Carmen discussion participation and lecture self-check

Chapter 17. Major Global Non-Infectious Diseases - Immune-Mediated Disorders: This lecture will introduce immune system and focuses on major immune-mediated disorders, such as autoimmune diseases and rheumatoid arthritis.
Reference:
1. Harrison's Principles of Internal Medicine. Part 11: Immune-Mediated, Inflammatory, and Rheumatologic Disorders
2. Karthikeyan G, Guilherme L. Acute rheumatic fever. Lancet. 2018;392:161-174
Assignments: Carmen discussion participation and lecture self-check

Chapter 18. Major Global Non-Infectious Diseases – Cancer 1: This lecture will introduce cancer biology and genetics, cancer prevention and early detection, skin and prostate cancers
Reference:
1. Harrison's Principles of Internal Medicine. Chapters 65-71; 72: Cancer of the Skin and 83: Benign and Malignant Diseases of the Prostate
2. Colman RJ, et al. Caloric restriction delays disease onset and mortality in rhesus monkeys. Science. 2009;325:201-4
Assignments: Carmen discussion participation and lecture self-check

Week 7
Chapter 19. Major Global Non-Infectious Diseases – Cancer 2: This lecture will focus on cancers of lung, breast, pancreas and liver
Reference:
1. Harrison's Principles of Internal Medicine. Chapter 74: Neoplasms of the Lung and Chapter 75: Breast Cancer; 78: Tumors of the Liver and Biliary Tree, and 79: Pancreatic Cancer
2. Gu D, et al. Mortality attributable to smoking in China. N Engl J Med. 2009;360:150-9

Assignments: Carmen discussion participation and lecture self-check

Chapter 20. Aging: This lecture will introduce the biology of aging and clinical problems associated with the aging process.
Reference:
1. Harrison's Principles of Internal Medicine. Part 18: Aging
2. Partridge L, et al. Facing up to the global challenges of ageing. Nature. 2018;561:45-56
Assignments: Carmen discussion participation and lecture self-check

Chapter 21. Frontiers: Emerging and advanced issues in human diseases are introduced and summarized, such as the roles of epigenetics, circadian biology, and climate change in health and disease
Reference:
1. Harrison's Principles of Internal Medicine. Part 20: Frontiers and Chapter 120: Climate Change and Infectious Disease
2. Rappaport SM. Genetic Factors Are Not the Major Causes of Chronic Diseases. PLoS One. 2016;11(4):e0154387
Assignments: Carmen discussion participation and lecture self-check

Week 8
Final examination preparation and exam: Original research proposal focusing on innovative ideal and hypothesis-driven research design

Chapter No.	Topics	Aligned Course Learning Objective(s)	Aligned CEPH Foundational Knowledge	Aligned Foundational (Core) Competencies	Aligned Specialization Competencies	Readings/ Other Assignments	Student Evaluation Activity for Assessment
1	Introduction to Global Issues and Global Health in Medicine	1,3,4,5,6	1,2,4,5,6,7,8, 9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. David Hemenway. Why We Don't Spend Enough on Public Health. N Engl J Med.2010; 362;18:1657-1658 2. Harrison's Principles of Internal Medicine. Part 17: Global Medicine	1. Carmen discussion 2. Lecture self-check
2	Basics in Human Health/Diseases	2,3	3,4,5,6,8,9,10 ,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Harrison's Principles of Internal Medicine. Part 2: Cardinal Manifestations and Presentation of Diseases 2. Sim I. Mobile Devices and Health. NEJM 2019	
3	Environmental Exposures and Diseases	1,2,3,4,5,6	4,5,6,7,8,9,10 ,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Harrison's Principles of Internal Medicine. Part 15 2. Hurst's The Heart, 13e.: Environment and Heart Disease 3. Auerbach PS. Physicians and the environment. JAMA. 2008 Feb 27;299(8):956-8	1. Carmen discussion 2. Lecture self-check
4	Occupational and Environmental Lung Disease					1. C. Arden Pope III, et al. Fine-Particulate Air Pollution and Life Expectancy in the United States. N Engl J Med 2. Robert K, et al. Advances in environmental and occupational disorders in 2008. J Allergy Clin Immunol. 3. Harrison's. Chapter 283	
5	Major Infectious Diseases: respiratory infections, STD, AIDS	1,2,3,4,5,6	4,5,7,8,9,10,1 1,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. R Rennie, B Crowson. The management of upper respiratory tract infections. JR Nav Med Serv.2013 2. Harrison's Principles of Internal Medicine. Chapters 194, 195, 197 3. Malani PN. Visions for an AIDS-Free Generation: Red Ribbons of Hope. JAMA. 2016 Jul 12;316(2):154-5.	1. Carmen discussion 2. Lecture self-check
6	Major Global Infectious Diseases: Tuberculosis					1. Curley. Rule out pulmonary tuberculosis: Clinical and radiographic clues for the internist. Cleve Clin J Med. 2. Harrison's. Chapter: Tuberculosis	

7 8	Major Infectious Diseases: Malaria Major Diseases: Malnutrition and Diarrhea	1,2,3,4,5,6	4,5,7,8,9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Lesho E. Cleve Clin J Med. 2005.72:921-927 2. Harrison's Principles of Internal Medicine. Chapter 219 1. Walker CL. Lancet. 2013;381:1405-16 2. Harrison's. Chapters 128 and 327	1. Carmen discussion 2. Lecture self-check
9 10	Major Respiratory Diseases-1 Major Respiratory Diseases-2	1,2,3,4,5,6	4,5,7,8,9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Fung V, et al. JAMA Pediatr. 2014;168:649-56 2. Harrison's. Chapters 281 and 286 1. Harrison's. Chapters 285 and 291 2. Drazen JM. Sleep apnea syndrome. NEJM. 2002	1. Carmen discussion 2. Lecture self-check
11 12	Cardiovascular Diseases-1 Cardiovascular Diseases-2	1,2,3,4,5,6	4,5,7,8,9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Estruch R, et al. Mediterranean Diet. NEJM. 2018 2. Harrison's. Chapters 232, 233, 267,271 1. Harrison's. Chapters 419-421 2. Chen R, et al. Neurology. 2013	1. Carmen discussion 2. Lecture self-check
13 14	Hypothesis-based research proposal Endocrinology and Metabolism	1,2,3,4,5,6	4,5,7,8,9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Aaron M. N Engl J Med 2009 2. Sun Q, et al. JAMA. 2005;294:3003-10 3. Example-Research proposal-animal 1.Pittas AG. Vitamin D Type 2 Diabetes. NEJM. 2019 2. Harrison's. Chapters 369, 376, 377; section 3	1. Carmen discussion 2. Lecture self-check
15 16	Major Neurologic Disorders Hematopoietic Disorders	1,2,3,4,5,6	1,2,3,4,5,6,12	1,3,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,4,6,7,8 PhD: 2,3,4,6,7,8,9	1. Alzheimer's Disease. Nature. 2011;S2-4 2. Harrison's. Chapters 417,423-426; section 5 1. Wiemels J. Chem Biol Interact. 2012 2. Harrison's. Section 2: Hematopoietic Disorders	1. Carmen discussion 2. Lecture self-check
17 18	Immune-Mediated Disorders Cancer-1	1,2,3,4,5,6	4,5,7,8,9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Harrison's. Part 11 2. Acute rheumatic fever. Lancet. 2018;392:161-174 1. Harrison's. Chapters 65-71; 72; 83 2. Colman RJ. Science. 2009;325:201-4	1. Carmen discussion 2. Lecture self-check
19 20	Cancer-2 Aging	1,2,3,4,5,6	4,5,7,8,9,10,11,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Harrison's. Chapters 74,75, 78, 79 2. Gu D. N Engl J Med. 2009;360:150-9 1. Harrison's. Part 18 2. Partridge L. Nature. 2018;561:45-56	1. Carmen discussion 2. Lecture self-check
21	Frontiers	1,2,3,4,5,6	1,2,4,5,6,12	1,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,6,7,8 PhD: 2,3,4,6,7,8,9	1. Harrison's: Part 20: Frontiers and Chapter 120 2. Rappaport SM. PLoS One. 2016;11(4):e0154387	1. Carmen discussion 2. Lecture self-check
	Final exam	1,2,3,4,5,6	1,2,3,4,5,6,12	1,3,4,6,19	MPH: 1,2,3,4,5,6,9,10 MS: 2,3,4,6,7,8 PhD: 2,3,4,6,7,8,9	No	Grant proposal