

Community and Population Health

Interim DEPARTMENT CHAIR:

Erica Hoelscher, Professor

DEPARTMENT FACULTY:

A listing of College of Health faculty may be found at health.lehigh.edu/faculty (https://health.lehigh.edu/faculty/)

Contact information:

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UNDERGRADUATE MAJORS

Biostatistics & HHealth Data Science

The Bachelor of Science (BS) in Biostatistics & Health Data Science (BHDS) delivers rigorous, quantitative knowledge, and statistical and computing skills needed to manage and analyze data to address important questions in public health and biomedical sciences. Students enrolled in the BHDS program are not limited to building quantitative skills only. Instead, students in the BHDS program are asked to enroll in courses in population health to provide a broad context for the quantitative skills they master. Biostatistics & Health Data Science graduates are trained to think critically about nuanced technical, social, and ethical issues arising from the semantics of health data they analyze while appreciating the importance of working with all stakeholders in using data to benefit societal health and well-being.

The BS degree requires a minimum of 120 credits.

COMMUNITY AND GLOBAL HEALTH

The Bachelor of Arts (BA) in Community and Global Health emphasizes conceptual, methodological, and analytical approaches to implementing health services, interventions, and programs in communities. Students study determinants of health including social, biological, environmental, political, and economic and learn to intervene to improve health based on these determinants. The BA emphasizes qualitative research methods, as well as mixed method approaches that combine qualitative with quantitative methods, and underscores the importance of cultural understandings in health within the United States and other nations. Finally, grounded in interdisciplinarity, the BA degree prepares students to improve global and domestic health outcomes.

The BA degree requires a minimum of 120 credits.

Health, Medicine, and Society

The Bachelor of Arts (BA) in Health, Medicine, and Society (HMS) focuses on the social scientific, humanistic, and applied community-engaged dimensions of health and medical care, developing an understanding of the impact of health, illness, and medical care on individuals, families, cultures, and societies. This program is intended to serve students who wish to be involved in some aspect of the healthcare industry or health policy and also students who are interested in communications, the pharmaceutical industry, law, business, agency work, and other careers where understanding healthcare is essential. This major requires students to declare a second major outside of HMS. The second major can be from any department or program at Lehigh.

The BA degree requires a minimum of 120 credits.

POPULATION HEALTH

The Bachelor of Science (BS) in Population Health degree prepares students to investigate the determinants of health using data science and to identify novel and effective avenues for disease prevention, health promotion, diagnosis, and intervention. Students gain knowledge and skills through coursework, experiential learning opportunities, research projects, and engagement with traditional and nontraditional partners in pursuit of a healthier world. The BS provides students with a strong conceptual background in

Population Health as well as extensive methodological expertise in data science and epidemiology.

The BS degree requires a minimum of 120 credits.

UNDERGRADUATE MINORS

Minors offered through the College of Health are open to any Lehigh undergraduate student. Minors can be declared by completing this form (https://powerforms.docuSign.net/329016c8-371a-40cf-9ed9-f08c3197cc71/?env=na3&acct=4522e8bc-42ec-46ec-af83-a167d8a26e3f&accountId=4522e8bc-42ec-46ec-af83-a167d8a26e3f&recipientLang=en). For more information, contact the College of Health advising office at cohadvising@lehigh.edu. (cohadvising@lehigh.edu)

Biostatistics	Health Policy & Politics
Community Health	Indigenous Peoples' Health
Epidemiology	Maternal & Child Health
Global Health	Population Health

GRADUATE PROGRAMS

It is more important now than ever to understand, preserve and improve the health and well-being of populations and communities locally, nationally, and globally -- this is at the heart of the mission of Lehigh University's College of Health. The College of Health offers a variety of exceptional graduate education programs that prepare students to investigate and address the multiple determinants of health through novel and innovative health research, practice, and policy. For more information, contact cohgrad@lehigh.edu (%20inchgrad@lehigh.edu).

PHD Population Health	Master of Science in Population Health Management (MS)
Master of Public Health (MPH)	4+1 Accelerated Master of Public Health (MPH)
MBA/MPH (with the College of Business)	4+1 Accelerated Master of Science in Population Health Management (MS)
Graduate Certificate in Population Health	Graduate Certificate Global Population Health
+1 Master of Engineering in Healthcare Systems Engineering (with the P.C. Rossin College of Engineering and Applied Science)	Flex MBA with Healthcare Management Concentration (with the College of Business)

MAJOR PROGRAMS

B.S. IN BIOSTATISTICS & HEALTH DATA SCIENCE

The Biostatistics & Health Data Science program draws on knowledge from many disciplines including mathematics, statistics, computing, and epidemiology, but frames these to the singular applied objective of advancing public health. It spans hypothesis generation, study design, data collection, data storage, data processing, analytic methods development, application and interpretation of analyses, dissemination, and translation. It emphasizes rigor, reproducibility, effective communication, and ethical practices. The major is intended for students who are interested in health, healthcare, and health policy from a data focused perspective, or students who seek to acquire analytic, computational, and data skills within the context of human health.

CORE REQUIREMENTS 36

Programming Core	
BSTA 030	Data Exploration in R
BSTA 040	Data Exploration in Python
Statistics Core	
BSTA 132	Health Data Science I: Inference
BSTA 133	Health Data Science 2: Regression
AI Core	
BSTA 141	Health Data Science III: Supervised Machine Learning in Health

BSTA 142	Health Data Science IV: Unsupervised Machine Learning in Health	
Health Core		
POPH 001	Introduction to Population and Public Health	
POPH 002	Population Health Research Methods & Application	
EPI 104	Fundamentals of Epidemiology	
EPI 305	Intermediate Epidemiology	
ELECTIVES		24
(24 credits from 3 clusters, at least one course from each cluster and a minimum of 6 credits of which are from Data or Methods).		
Elective courses may count towards college distribution requirements.		
Society Cluster		
POPH 003	Justice, Equity, and Ethics in Population Health	
BSTA 007	Frontiers of AI in Health	
CGH 103	Biological & Environmental Determinants of Health	
CGH 104	Sociocultural & Political Determinants of Health	
CGH 105	Commercial Determinants of Health	
CGH 313	Health Policy and Politics	
CGH 332	Aging, Health, and Social Policy	
Data Cluster-all courses have a prerequisite completion of AI Core		
BSTA 372	Analyzing Electronic Health Record Data	
BSTA 373	Analyzing Clinical Natural Language Data	
BSTA 374	Analyzing Health GIS Data	
BSTA 375	Analyzing Health Sensor Data	
BSTA 376	Deep Learning for Healthcare	
Methods Cluster-all courses have a prerequisite completion of Statistics Core		
BSTA 381	Analysis of Dependent Data	
BSTA 383	Survival Analysis	
BSTA 384	Network Analysis	
BSTA 309	Outbreak Science & Public Health Forecasting	
BSTA 386	Bayesian Analysis	
BSTA 387	Analyzing Data in SAS	
Portfolio Project-Concurrent with Data/Methods electives		1
BSTA 399	Portfolio Project	
MATH & COMPUTER SCIENCE DISTRIBUTION		14
MATH 051	Survey of Calculus I	
MATH 052	Survey of Calculus II	
MATH 043	Survey of Linear Algebra	
CSE 012	Introduction to Programming with Python	
Total Credits		75

B.A. IN COMMUNITY AND GLOBAL HEALTH

The major in community and global health emphasizes conceptual, methodological, and analytical approaches to implementing health services, interventions, and programs in communities. Students study determinants of health, including social, biological, environmental, political, and economic and learn to intervene to improve health based on these determinants. The BA emphasizes qualitative research methods, as well as mixed method approaches that combine qualitative with quantitative methods. and underscores the importance of cultural understandings in health within the United States and

other nations. Finally, grounded in interdisciplinarity, the BA degree prepares students to improve global and domestic health outcomes.

The BA degree requires a minimum of 120 credits. Students gain an understanding of multiple determinants of health and use a strong foundation in qualitative and quantitative research methods to improve health outcomes in communities both domestically and globally.

Core courses		18
CGH 001	Community Health	
CGH 004	Introduction to Global Health	
CGH 101	Careers in Community and Global Health Studies	
CGH 103	Biological & Environmental Determinants of Health	
CGH 104	Sociocultural & Political Determinants of Health	
CGH 105	Commercial Determinants of Health	
Field Experience or Practicum		6-8
CGH 301	Community and Global Health Field Experience I	
or CGH 303	Honors Community and Global Health Field Experience I	
CGH 302	Community & Global Health Field Experience II	
or CGH 304	Honors Community and Global Health Field Experience II	
Methods Requirement		9-12
One qualitative course, one quantitative course, and one course at the 300-level or above from the list below or in consultation with the advisor.		
BSTA 001 & BSTA 002	Population Health Data Science I and Population Health Data Science I Algorithms Lab	
BSTA 005	Statistical Literacy in Health	
BSTA 101 & BSTA 103	Population Health Data Science II and Population Health Data Science II Algorithms Lab	
CGH 106	Qualitative Methods in Health Research	
CGH 305	Advanced Qualitative Methods in Community and Global Health	
CGH 308	Community Health Intervention Design	
EPI 304	Methods in Epidemiology I	
EPI 305	Intermediate Epidemiology	
HMS 375	Community Based Participatory Research Methodology	
Cross-Cultural or Diversity Requirement		9-12
A minimum of three courses and 9 credits from the list below or in consultation with the advisor.		
CGH 021	Culture and Health	
CGH 022	Global Perspectives on Health	
CGH 122	Indigenous Healing Traditions	
CGH 311	Religion, Spirituality, and Health	
CGH 322	Contemporary Indigenous Health	
ANTH 155	Medical Anthropology	
Electives		15-20
Five electives chosen in consultation with the advisor and must have an applied focus. ²		
Collateral Requirement		
Foreign Language		

Community and Global Health majors are required to complete the equivalent of two semesters of language study other than English but in the same language. This requirement can be fulfilled using credits from courses taken at Lehigh, from high school AP language tests reported to Lehigh's registrar, from courses taken elsewhere, or some combination of these. If the student is already a fluent speaker in a second language besides English, then the language requirement is waived; fluency will be determined in consultation with faculty from the MLL department.

Total Credits**57-70**

1

Graduate courses require special approval.

2

College of Health course prefixes include: BSTA (Biostatistics), EPI (Epidemiology), HIT (Health, Innovation and Technology), POPH (Population Health), CGH (Community and Global Health), PUBH (Public Health)*

*PUBH courses are graduate-level and require special permission.

B.A. in health, Medicine, and society

The Health, Medicine, and Society major is jointly administered by the College of Arts and Sciences and the College of Health. The challenge of meeting the increasingly complex health needs of growing and aging populations is moving to the forefront of national and international concerns in the 21st century. The Interdisciplinary Health, Medicine, and Society Major focuses on the social scientific, humanistic, and applied community-engaged dimensions of health and medical care to develop an understanding of how health, illness, and medical care impact individuals, families, culture, and societies. The joint major is intended to serve students who wish to be involved in some aspect of the healthcare industry, health policy, or public health and also students who are interested in communications, the pharmaceutical industry, law, business, agency work, and other careers where understanding health care is essential.

MAJOR REQUIREMENTS

In addition to the 30-36 required credits, all HMS majors are required to have a second major.^{1, 2}

A minimum of 3 courses must be taken at the 300 level.

No more than two courses for a maximum of 8 credits may be taken outside of Lehigh, including non-Lehigh study abroad.

CORE REQUIREMENTS**14-16****Health Humanities Core Course**

HMS 170	Medical & Health Humanities
or HMS/PHIL/REL/ETH 116	Bioethics

Behavior, Culture, & Society Core Course

HMS/PSYC 130	Introduction to Health Psychology
or HMS/SOC 160	Medicine and Society

Public Health Core Course

POPH 001	Introduction to Population and Public Health
or CGH 001	Community Health
or CGH 004	Introduction to Global Health

Health Research Methods Core Course³

POPH 002	Population Health Research Methods & Application
or BSTA 001	Population Health Data Science I (Releveled to BSTA 101)
or BSTA 005	Statistical Literacy in Health
or CGH 106	Qualitative Methods in Health Research

CONCENTRATIONS⁴**9-12**

Students must take a minimum of 3 courses outside of the core requirements in one of the following concentrations:

Health Humanities**or****Behavior, Culture, & Society****or****Public Health & Policy**

Please see below for lists of concentration courses.

ELECTIVE REQUIREMENTS⁴**6-8**

Take any 2 additional HMS courses (at least one of which must be outside of the selected concentration)

1

Students are required to meet the distribution requirements of the college they were admitted to, either the College of Health or the College of Arts & Sciences.

If a student pursues the required second major as a B.A. through another college, they are required to fulfill the distribution requirements listed for a CAS/CoH B.A.+B.A . Students who pursue a combination of a B.A.+ B.S. are required to petition for a dual degree.

2

No more than two courses outside of the core courses can come from cross-listed courses within the second major, and no more than 3 courses can double-count towards both majors regardless of home college.

3

Research methods required course should be chosen in consultation with Advisor. Major dependent courses that may meet this requirement include SOC 211 Research Methods and Data Analysis, PSYC 202 Research Methods and Data Analysis II, IR 100 Methods and Research Design, ECO 045 Statistical Methods, and BIOS 130 Biostatistics.

4

A maximum of 4 credits of HMS 221 Peer Education Foundations, HMS 271 Independent Study, HMS 292 Supervised Research, HMS 293 Internship , or HMS 294 Health Equity Internship may fulfill the major elective or major concentration requirements.

CONCENTRATION AND ELECTIVE COURSES

A complete list of course offerings can be found each semester on the College of Health (<https://health.lehigh.edu/academics/course-offerings/>) and HMS (<https://hms.cas.lehigh.edu/content/course-offerings/>) websites. Other elective courses may be approved at the discretion of the program director.

HEALTH HUMANITIES CONCENTRATION**Take Three**

HMS/REL/ETH 002	Death and Dying: Religious and Ethical Perspectives
HMS/ETH/PHIL/REL 106	Bioethics and the Law
HMS/ENGL 115	Topics in Literature, Medicine, and Health
HMS/HIST 118	History of Modern Medicine
HMS 142	The Greek and Latin Roots of Medical Terminology
HMS/FILM 166	Topics in Film and Health
HMS/AAS/HIST/GS 176	Keeping Africa and Africans Healthy: A History of Illness and Wellness
HMS/REL/ETH 226	From Black Death to Covid-19: Plague, Pandemic, Ethics and Religion
HMS/MLL 257	Traditional Chinese Medicine: Historical Perspectives
HMS/SPAN/LAS 270	Spanish for the Health Professions
HMS/ENGL 315	Topics in Literature, Medicine, and Health
POPH 003	Justice, Equity, and Ethics in Population Health

POPH 319	Population Health Bioethics	
Total Credits		10-12

BEHAVIOR, CULTURE, & SOCIETY CONCENTRATION**Take Three**

HMS/POLS/EVST 110	Environmental Planning for Healthy Cities
HMS/HIST/WGSS 125	Does Sex have a History? The History of Sexuality in the United States
HMS/PSYC 138	Psychopathology
HMS/COMM 150	Health Communication
HMS/ANTH/GS 155	Medical Anthropology
HMS/SOC 162	HIV/AIDS and Society
HMS/PSYC 302	Stress and Coping
HMS/AAS/GS/SOC 314	Infections and Inequalities: HIV, TB and Malaria in the Global South
HMS/PSYC 319	The Psychology of Trauma
HMS/EVST/POLS 320	Food Justice in Urban Environments
HMS/SOC/GS 322	Global Health Issues
HMS/JOUR/EVST 323	Health and Environmental Controversies
HMS 327/327/PSYC 327	Advanced Topics in Health Psychology
HMS/PSYC/WGSS 334	The Psychology of Body Image and Eating Disorders
HMS/PSYC 344	Health Care Reasoning and Decision Making
HMS/PSYC 348	Drugs and Behavior
HMS/PSYC 386	Pediatric Psychology
ECO 368	Health Economics

Total Credits		11-12
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PUBLIC HEALTH & POLICY CONCENTRATION**Take Three**

HMS 221	Peer Education Foundations
HMS/POLS 307	The Politics of Mental Health Policy
HMS/POLS 354	U.S. Health Care Politics
CGH 004	Introduction to Global Health
CGH 105	Commercial Determinants of Health
CGH 107	What is the US Healthcare Ecosystem?
CGH 305	Advanced Qualitative Methods in Community and Global Health
CGH 306	Mixed Methods in Health Research
CGH 307	Health Survey Research Methods
CGH 308	Community Health Intervention Design
CGH 313	Health Policy and Politics
CGH 316	Global Environmental Disasters & Policy
CGH 331	Healthcare Finance
CGH 332	Aging, Health, and Social Policy
CGH/HMS/EDUC 375	Community Based Participatory Research Methodology
EPI 104	Fundamentals of Epidemiology
EPI 305	Intermediate Epidemiology
EPI 306	Lifecourse Epidemiology
POPH 105	Introduction to Maternal and Child Health

Total Credits		9-12
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OTHER COURSES AND ELECTIVES

BIOS 010	Bioscience in the 21st Century	3
EES 029	Human Health and the Environment	3

HMS 090	Freshman Seminar	1-4
CGH 103	Biological & Environmental Determinants of Health	4
POPH 106	Global Environment and Human Welfare	3
CGH 120	Independent Study or Research in Community and Global Health	1-4
POPH 120	Independent Study or Research in Population Health	1-4
CGH 130	Internship in Community and Global Health	1-4
POPH 130	Internship in Population Health	1-4
CGH 150	Special Topics in Community and Global Health	3-4
POPH 150	Special Topics in Population Health	3-4
HMS 291	Special Topics	1-4
HMS 292	Supervised Research	1-8
HMS 293	Internship	1-8
BSTA 308	Advanced R Programming	3
EPI 310	Environmental Epidemiology & Exposure Science	3
CGH 315	Medical Mysteries	3
CGH 330	Internship in Community and Global Health	1-4
POPH 330	Internship in Population Health	1-4
CGH 350	Special Topics in Community and Global Health	3-4
POPH 350	Special Topics in Population Health	3-4

B.S. IN POPULATION HEALTH

The major in population health prepares students to investigate the determinants of health using data science and to identify novel and effective avenues for disease prevention, health promotion, diagnosis, and intervention. Students gain knowledge and skills through coursework, experiential learning opportunities, research projects, and engagement with traditional and nontraditional partners in pursuit of a healthier world. The BS provides students with a strong conceptual background in Population Health as well as extensive methodological expertise in data science and epidemiology.

The BS in Population Health requires a minimum of 120 credits. Students gain a strong conceptual background in Population Health as well as extensive methodological expertise in data science and epidemiology.

Core Requirement

POPH 001	Introduction to Population and Public Health	4
POPH 002	Population Health Research Methods & Application	4
POPH 104	Careers in Population Health	3
EPI 304	Methods in Epidemiology I	3
EPI 305	Intermediate Epidemiology	3

Data Science Requirement ¹

BSTA 001 & BSTA 002	Population Health Data Science I and Population Health Data Science I Algorithms Lab	4
BSTA 101 & BSTA 103	Population Health Data Science II and Population Health Data Science II Algorithms Lab	4

Two upper-level methods courses chosen in consultation with adviser.

Determinants of Health (choose 2)

CGH 103	Biological & Environmental Determinants of Health	4
CGH 104	Sociocultural & Political Determinants of Health	4
CGH 105	Commercial Determinants of Health	4

Capstone Project		6-8
POPH 301	Population Health Capstone (Proposal)	
or POPH 305	Honors Population Health Capstone (Proposal)	
POPH 302	Population Health Capstone (Execution)	
or POPH 306	Honors Population Health Capstone (Execution)	

Electives	15-20
5 electives chosen in consultation with an adviser. ²	

Total Credits	60-69
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1

MATH 051 Survey of Calculus I or equivalent recommended

2

College of Health course prefixes include: BSTA (Biostatistics), CGH (Community and Global Health), EPI (Epidemiology), HIT (Health, Innovation and Technology), POPH (Population Health), and PUBH (Public Health)*

*PUBH courses are graduate-level and require special permission.

PLAN OF STUDY FOR PRE-HEALTH STUDENTS

Many College of Health students enter Lehigh with a plan to continue graduate-level work in a health-related discipline. Pre-health students at Lehigh can major in any area, provided they also complete the prerequisite coursework set forth by the medical, dental, or other professional programs they are interested in. Students interested in attending medical school or other health-related schools should contact The Center for Career & Professional Development (<https://careercenter.lehigh.edu/>) (careercenter@lehigh.edu (careerservices@lehigh.edu)) and ask to be enrolled in the Pre-Health Advising Course Site. The proposed plan of study below should be discussed with your adviser. *Please note that pre-health prerequisites cannot be applied as major electives but will instead be listed as free electives on your transcript.*

First Year			
Fall	CR	Spring	CR
WRT 001 or 003	3	(1) course to fulfill major requirements	3
MATH 051	4	WRT 002 or 005	3
CHM 030	4	MATH 052	3
First-year seminar		CHM 031 or 041	4
		BIOS 041 & BIOS 042 ¹	4
	11		17

Second Year			
Fall	CR	Spring	CR
(1) Course to fulfill major requirements	3	(2) Courses to fulfill major requirements	6-8
CGH 104 ²	4	CGH 021 ²	3
CHM 110 & CHM 111	4	BSTA 101 & BSTA 102 ³	3
BIOS 115 & BIOS 116	4	CHM 112 & CHM 113	4
PSYC 001	4		
	19		16-18

Third Year			
Fall	CR	Spring	CR
(1) Course to fulfill major requirements	3-4	(3) Courses to fulfill major requirements	9-12
CGH 101 or POPH 104	3	PHY 013 & PHY 022	4

PHY 010 & PHY 012	4	BIOS 372	3
BIOS 044 & BIOS 045	4		
BIOS 371	3		

17-18	16-19
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Fourth Year			
Fall	CR	Spring	CR
(4) Courses to fulfill major requirements	12-15	(3) Courses to fulfill major requirements	9-12
Major capstone or field/practicum experience	3-4	Major capstone or field/practicum experience	3-4
15-19		12-16	

Total Credits: 123-137

1

First-year students accepted into the SEA-PHAGES program will enroll in BIOS 043 Phage Hunting Laboratory Phage Hunting Laboratory lab instead of BIOS 042 Introduction to Cellular and Molecular Biology Laboratory.

2

Recommended courses to prepare students for the sociology section of MCAT include CGH 104 Sociocultural & Political Determinants of Health and CGH 021 Culture and Health. Students are encouraged to use these courses toward their major requirements.

3

BSTA 005 Statistical Literacy in Health or BSTA 101 Population Health Data Science I & BSTA 102 Population Health Data Science I Algorithms Lab fulfills the statistics MCAT requirement.

4+1 ACCELERATED PROGRAMS

Qualified students can earn an MS in Population Health Management or an MPH (Master of Public Health) at an accelerated pace.

Students accepted into the 4+1 accelerated program begin taking graduate classes during their junior and senior years and can complete the program one year after graduating with their undergraduate degree. Current Lehigh students who have a minimum overall GPA of 3.5 may be automatically accepted into the 4+1 accelerated program once they have achieved junior standing, a minimum of 54 credits. Students in these programs who do not qualify for direct admittance based on their GPA are welcome to apply for acceptance.

Students interested in learning more about the 4+1 programs are encouraged to reach out to the College of Health advising office at cohadvising@lehigh.edu or submit their intention to declare here (https://docs.google.com/forms/d/e/1FAIpQLScGcGiBCBxFd2m-0LU9r7ISx-q_gSCGULzRGn1L8jCFgUnQ/viewform/?usp=sf_link).

Benefits of the 4+1 program include:

- 30% tuition discount on graduate tuition;
- No application process for students with an overall GPA of 3.5 or better;
- Completion up to 4 graduate courses while an undergraduate student;
- A savings of more than 40% off the total cost of the graduate degree;
- Fulfillment of the MS or MPH degree requirements in 1/2 the time.

MINOR PROGRAMS

Minor programs in the College of Health are open to students from across the university. Students who have completed courses in their major that are also required for a minor may only count one course for both.

For more information, contact the College of Health at cohadvising@lehigh.edu. To declare any minor offered

by the College of Health, complete this form (<https://powerforms.docuSign.net/329016c8-371a-40cf-9ed9-f08c3197cc71/?env=na3&acct=4522e8bc-42ec-46ec-af83-a167d8a26e3f&accountId=4522e8bc-42ec-46ec-af83-a167d8a26e3f&recipientLang=en>).

BIOSTATISTICS

The Biostatistics minor provides quantitatively oriented students with conceptual knowledge and hands-on skills in applied statistics and data science techniques commonly employed in the field of biostatistics. The curriculum seeks to prepare students to interpret and contribute to quantitative research in health-related fields, including community and population health. The minor serves to broaden student employment possibilities post-Lehigh while making them more competitive as applicants to health-related graduate programs that favor prior training in applied statistics.

BSTA 101 & BSTA 102	Population Health Data Science I and Population Health Data Science I Algorithms Lab	4
BSTA 103 & BSTA 104	Population Health Data Science II and Population Health Data Science II Algorithms Lab	4
Electives (choose 3 from the list below, or in consultation with your adviser)		9
BSTA 305		
BSTA 306		
BSTA 307		
BSTA 308	Advanced R Programming	
BSTA 309	Outbreak Science & Public Health Forecasting	
BSTA 320	Independent Study or Research in Biostatistics	

Total Credits 17

COMMUNITY HEALTH

The minor in community health is for students **not** pursuing a major in community and population health. Students explore the multiple determinants of health and learn how to take a qualitative approach to investigate these determinants.

Core Requirement

CGH 001	Community Health	3
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Methods Requirement (choose one) 3-4

BSTA 005	Statistical Literacy in Health	
CGH 106	Qualitative Methods in Health Research	
BSTA 101 & BSTA 102	Population Health Data Science I and Population Health Data Science I Algorithms Lab	

Determinant Class (choose one) 4

CGH 103	Biological & Environmental Determinants of Health	
CGH 104	Sociocultural & Political Determinants of Health	
CGH 105	Commercial Determinants of Health	

Two electives, including at least one cross-cultural, at least
one 300-level 6-8

Total Credits 16-19

Epidemiology

The minor in epidemiology provides students with conceptual knowledge and hands-on skills necessary to measure human health among populations. Students can use this knowledge in their daily lives and in practical application to their major field of study. These skills are essential to health-related fields, including community and population health, and medicine, and are increasingly attractive in the fields of business, engineering, biological or social sciences, especially as populations prepare for and mitigate emerging chronic and infectious diseases.

Core courses

EPI 104	Fundamentals of Epidemiology ¹	3
EPI 305	Intermediate Epidemiology ²	3

Choose 3 electives at the 300 level from the list below:

EPI 306	Lifecourse Epidemiology	
EPI 308	Spatial Epidemiology	
EPI 309	Chronic Disease Epidemiology	
EPI 310	Environmental Epidemiology & Exposure Science	
EPI 311	Psychiatric Epidemiology and Global Mental Health	
BSTA 309	Outbreak Science & Public Health Forecasting	

Or another in consultation with adviser

Total credits 15-18

1 & 2

Students who have taken EPI 104 and EPI 305 for their major can only count **one** of these courses toward the EPI minor; for the other, they would need to replace it with another comparable course (selected in consultation with an adviser) that is at least 3 credits.

GLOBAL HEALTH

The minor in global health is for students **not** pursuing a major in community and population health. Students in the Global Health minor will gain an understanding of global health concerns and their determinants and comparative approaches for health promotion, disease prevention, and health care delivery in the international sphere.

CGH 004	Introduction to Global Health	3
POPH 106	Global Environment and Human Welfare	3
Field or Research Experience ¹		3-4
Two electives in consultation with adviser. One elective must be at the 300-level.		6-8

Total Credits 15-18

1

Approved Field or Research Experience courses include POPH 120 Independent Study or Research in Population Health, POPH 130 Internship in Population Health, POPH 320 Independent Study or Research in Population Health, POPH 330 Internship in Population Health, CGH 120 Independent Study or Research in Community and Global Health, CGH 130 Internship in Community and Global Health, CGH 320 Independent Study or Research in Community and Global Health, CGH 330 Internship in Community and Global Health, CINQ 387 Creative Inquiry Projects, CINQ 389 Inquiry to Impact Group Projects or other credit or non-credit experience chosen in consultation with the adviser. In the event that a student pursues a non-credit bearing field experience, the student will be required to fulfill the credit requirements for the minor by choosing an additional elective.

HEALTH POLICY & POLITICS

The minor in health policy & politics is intended for students interested in receiving more advanced training and experiences in healthcare policy-making processes and the political factors that influence this process. Courses introduce the theoretical and empirical approaches to understanding the different phases of the policy-making process; the important roles that politicians, bureaucrats, and civil society play in the design and implementation of policy; as well as the role of the international community, such as the World Health Organization (WHO).

CGH 004	Introduction to Global Health	3
CGH 313	Health Policy and Politics	3
Determinant Class (choose one)		3-4
CGH 104	Sociocultural & Political Determinants of Health	

CGH 105	Commercial Determinants of Health	
Field or Research Experience ¹		3-4
Two electives in consultation with adviser. One elective must be at the 300-level.		6-8
Total Credits		18-22

1

Approved Field or Research Experience courses include POPH 120 Independent Study or Research in Population Health, POPH 130 Internship in Population Health, POPH 320 Independent Study or Research in Population Health, POPH 330 Internship in Population Health, CGH 120 Independent Study or Research in Community and Global Health, CGH 130 Internship in Community and Global Health, CGH 320 Independent Study or Research in Community and Global Health, CGH 330 Internship in Community and Global Health, CINQ 387 Creative Inquiry Projects, CINQ 389 Inquiry to Impact Group Projects or other credit or non-credit experience chosen in consultation with the adviser. In the event that a student pursues a non-credit bearing field experience, the student will be required to fulfill the credit requirements for the minor by choosing an additional elective.

INDIGENOUS PEOPLES HEALTH

The undergraduate minor in Indigenous peoples health will provide students with a basic understanding of the concepts and perspectives needed to work with the Indigenous peoples of the Americas and their communities. Through their coursework students will learn about issues such as sovereignty, colonialism, historical trauma, and the connections these concepts play in the health disparities, inequalities, and inequities Indigenous peoples face today. Students will also learn the basics of developing and implementing health programs with Indigenous peoples and their communities.

Core courses

CGH 122	Indigenous Healing Traditions	3
CGH 322	Contemporary Indigenous Health	3

Experiential Learning Component

POPH 120	Independent Study or Research in Population Health	3-4
or POPH 320	Independent Study or Research in Population Health	

Electives (choose 2 from this list below or in consultation with the advisor)

CGH 004	Introduction to Global Health	
CGH 021	Culture and Health	
CGH 104	Sociocultural & Political Determinants of Health	
CGH 151	Special Topics in Indigenous Peoples Health	
CGH 351	Special Topics in Indigenous Peoples Health	
POPH 003	Justice, Equity, and Ethics in Population Health	
POPH 106	Global Environment and Human Welfare	
HMS/EDUC 375	Community Based Participatory Research Methodology	

Total Credits **15-16**

MATERNAL & CHILD HEALTH

The maternal and child Health minor provides students with a deeper understanding of the lifecourse approach as well as the multiple determinants that shape the health and wellbeing of women, children, and families across the life course and intergenerational. Students apply these foundational concepts to evaluate maternal and child health research, programs, and policies in the US and globally.

POPH 001	Introduction to Population and Public Health	3-4
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or CGH 001	Community Health	
POPH 105	Introduction to Maternal and Child Health	3
EPI 306	Lifecourse Epidemiology	3
Electives (two courses chosen in consultation with the advisor)		6-8
Total Credits		15-18

POPULATION HEALTH

The minor in population health is for students **not** majoring in population health. The minor program provides students with an overview of the data science approach to investigating the multiple determinants of health.

POPH 001	Introduction to Population and Public Health	4
POPH 002	Population Health Research Methods & Application	4
BSTA 001 & BSTA 002	Population Health Data Science I (Reveled to BSTA 101) and	4
EPI 104	Fundamentals of Epidemiology	3
Elective chosen in consultation with the adviser		3-4
Total Credits		18-19

DOCTORAL PROGRAM

PHD IN POPULATION HEALTH

Lehigh University's Doctor of Philosophy (Ph.D.) in Population Health degree prepares doctoral students to investigate, integrate, and address health determinants using data science and develop novel and effective avenues for disease diagnosis and prevention, health promotion, and intervention. The program combines foundational courses in population health with additional data science, qualitative research methods, population health survey methods, research ethics, and policymaking. By providing a strong disciplinary and methodological foundation in Population Health through coursework, experiential learning opportunities, research projects, and engagement with traditional and non-traditional partners to pursue a healthier world, the Ph.D. program prepares students to pursue an independent line of inquiry and develop their own body of research.

The Ph.D. degree requires a minimum of 72 credits. During the last semester of coursework, students will complete the qualifying exam, developed by the doctoral adviser and secondary faculty mentor. Once students pass the qualifying exam, they will work closely with their doctoral committee to complete the dissertation proposal and dissertation defense stages.

Core Requirements **27**

HLTH 400	Philosophical and Theoretical Foundations of Population Health	
POPH 401	Population Health Concepts and Methods	
POPH 403	Biological Basis of Population Health: Concepts and Methods	
POPH 405	Qualitative Research Methods	
POPH 409	Social Determinants of Health	
HLTH 412	Research Ethics in Population Health	
HLTH 416	Grant Writing	
BSTA 402	Biostatistics in Health	
HLTH 417	Teaching Community and Population Health	
EPI 404	Methods in Epidemiology I	

Methods or Electives **27**

Twelve graduate-level courses, a minimum of 36 credits, chosen in consultation with an adviser. Students are encouraged to take courses that will provide them with additional expertise in substantive and/or methodological areas of interest; three of these courses must focus on a methodological area of interest. Courses taken outside the College of Health must be approved by an advisor.

Population Health Dissertation Proposal ¹		1-8
HLTH 482	Population Health Dissertation Proposal	1-8

Students will work closely with their doctoral advisor and doctoral committee to develop their dissertation proposal. Students will orally defend their dissertation proposal to their doctoral committee and will need to obtain approval before proceeding to the dissertation phase.

Population Health Dissertation ²		1-8
HLTH 499	Population Health Dissertation	1-8

Students will work closely with their doctoral advisor and doctoral committee to complete their dissertation project. Students will be required to pass their dissertation defense and incorporate feedback from the committee in order to meet the graduation requirements for the doctoral degree.

Total Minimum Credits	72
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1

If students complete 72 credits beyond the undergraduate degree and prior to advancing to candidacy, they need to be enrolled in at least 3 credit hours per semester.

2

After completion of 72 credits beyond the bachelor's degree, students are permitted to register for 'Maintenance of Candidacy' and will be charged a single credit hour of graduate tuition per semester.

MASTER PROGRAMS**MASTER OF PUBLIC HEALTH (MPH)**

Lehigh University's Master of Public Health (MPH) degree is a generalist degree that prepares students to work in a variety of local, state, national, and global public health research, practice, and policymaking settings. Students gain expertise in the core domains of public health, investigate and address the determinants of health using data science, and develop novel and effective avenues for disease prevention and health promotion. The program combines foundational courses in public health with additional courses in data science, qualitative research methods, leadership, cultural understanding and health, and policymaking. Students gain knowledge and skills through coursework, experiential learning opportunities, research projects, and engagement with traditional and non-traditional partners to pursue a healthier world. The MPH program is designed to meet the Council on Education for Public Health (CEPH) accreditation requirements. The MPH degree requires a minimum of 42 credits.

Core Requirements¹

BSTA 402	Biostatistics in Health	² 3
EPI 404	Methods in Epidemiology I	3
POPH 405	Qualitative Research Methods	3
PUBH 401	Health Promotion and Education	3
PUBH 402	Health Services, Administration, Politics, and Policy	3
PUBH 403	Health Program Planning and Implementation	3
PUBH 405	Program Evaluation Methods	3
POPH 409	Social Determinants of Health	3

Generalist Requirements

POPH 431	Environmental Health Justice	3
EPI 405	Methods in Epidemiology II	3
BSTA 403	Health Applications in Statistical Learning	3

Elective¹

Students are encouraged to take an elective that will provide them with additional expertise in a substantive or methodological area of interest. Electives can be taken outside the College of Health, but adviser approval is required.

Practicum and Capstone

PUBH 410	Applied Practice Experience	3
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PUBH 411	Public Health Capstone	3
Total Credits		42

1

For students enrolled in the 4+1 accelerated BS/MPH or BA/MPH program, courses taken during the student's undergraduate degree cannot be applied as an undergraduate degree requirement.

2

If the student has taken BSTA 101/102 and BSTA 103/104 at the undergraduate level, replace BSTA 402 with an adviser-approved elective.

MASTER OF Science in POPULATION HEALTH Management (MS)

Lehigh University's Master of Science (MS) in Population Health Management degree prepares graduate students to investigate and address health determinants using data science and develop novel and effective avenues for disease diagnosis and prevention, health promotion, and intervention. The program combines foundational courses in population health with additional data science, qualitative research methods, population health survey methods, research ethics, and policymaking. Students gain knowledge and skills through coursework, experiential learning opportunities, research projects, and engagement with traditional and non-traditional partners to pursue a healthier world. The MS degree requires a minimum of 33 credits.

Core Requirements¹

POPH 401	Population Health Concepts and Methods	² 3
POPH 403	Biological Basis of Population Health: Concepts and Methods	3
POPH 409	Social Determinants of Health	3
PUBH 402	Health Services, Administration, Politics, and Policy	3
CGH 335	Healthcare Operations Management	3
CGH 331	Healthcare Finance	3
BSTA 402	Biostatistics in Health	3
Select one other 400-level BSTA course		3
BSTA 403	Health Applications in Statistical Learning	
BSTA 404	Data Architecture, Mining, and Linkage	
EPI 404	Methods in Epidemiology I	3
POPH 405	Qualitative Research Methods	3
POPH 410	Population Health Capstone/Thesis Project	3

Total Credits	33
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1

For students enrolled in the 4+1 accelerated BS/MS program or BA/MS program, courses taken during the student's undergraduate degree cannot be double-counted as an undergraduate degree requirement.

2

4+1 students who have taken BSTA 101/102 and BSTA 103/104 as undergraduates should not take BSTA 402 but will still need to fulfill those three credits with another quantitative course approved by adviser.

4+1 ACCELERATED PROGRAMS

Qualified students can earn an MS in Population Health Management or an MPH (Master of Public Health) at an accelerated pace.

Students accepted into the 4+1 accelerated program begin taking graduate classes during their junior and senior years and can complete the program one year after graduating with their undergraduate degree. Current Lehigh students who have a minimum overall GPA of 3.5 may be automatically accepted into the 4+1 accelerated program once they have achieved junior standing, a minimum of 54 credits. Students in these programs who do not

qualify for direct admittance based on their GPA are welcome to apply for acceptance.

Students interested in learning more about the 4+1 programs are encouraged to contact the College of Health graduate advising at cohgrad@lehigh.edu (cohadvicing@lehigh.edu).

Benefits of the 4+1 program include:

- 30% tuition discount on graduate tuition;
- No application process for students with an overall GPA of 3.5 or better;
- Completion of up to 4 graduate courses while an undergraduate student;
- A savings of more than 40% off the total cost of the graduate degree;
- Fulfillment of the MS or MPH degree requirements in 1/2 the time.

GRADUATE CERTIFICATES

POPULATION HEALTH CERTIFICATE

The graduate certificate in population health will prepare students to learn and apply graduate-level introductory Population Health concepts and methodology. The 12 credits earned in this certificate program can be applied to either the Master of Public Health (MPH) or the Master of Science (MS) in Population Health Management.

POPH 401	Population Health Concepts and Methods	3
EPI 404/304	Methods in Epidemiology I	3
BSTA 402	Biostatistics in Health	3
or POPH 405	Qualitative Research Methods	
Elective chosen in consultation with the advisor.		3-4

Total Credits 12-13

GLOBAL HEALTH CERTIFICATE

The graduate certificate in Global Health prepares students to be global and population health leaders through research, education, and experiential learning, both domestically and internationally. Students who participate in the graduate Global Health certificate will have a strong interest in examining the ways health disparities and specific risk factors affect local and global populations. The graduate certificate in Global Health aims to provide students with skills to evaluate global health programs and design evidence-based interventions. To function well in the field of global health, students must be able to recognize cultural differences, consider social inequalities, and work with diverse groups. A large focus is also on the ethics of global health research and interventions. The graduate certificate program aims to help prepare students for a wide array of potential career paths in global health or population health. The 12 credits earned in this certificate program can be applied toward either the MPH or the MS in Population Health Management.

POPH 413	Foundations of Global Health	3
POPH 414	Global Health Research or Field Experience	3
BSTA 402	Biostatistics in Health	3
or POPH 405	Qualitative Research Methods	
Elective chosen in consultation with the advisor.		3

Total Credits 12

JOINT PROGRAMS

1-MBA and MPH Dual Degree Program

The 1-MBA and Master of Public Health (MPH) dual degree program (<https://business.lehigh.edu/academics/graduate/masters-programs/one-year-mba/mpd-dual-degree/>) offers participating students the opportunity to gain strong strategic business skills with a focus on public health. The 1-MBA/MPH dual degree program enables students interested in the Biotechnology, Pharmaceutical, Occupational Health, and Health Care industries to complete two complimentary degrees within a two-year timeframe.

Flex MBA with HealthCARE MANAGEMENT Concentration

The College of Business FLEX MBA (<https://business.lehigh.edu/academics/graduate/masters-programs/flex-mba/about-program/curriculum/>) is a 36-credit program with combined core and elective coursework. Students choosing the healthcare management concentration will take four graduate courses in the College of Health chosen in consultation with an adviser.

4+1 MASTER OF ENGINEERING IN HEALTHCARE SYSTEM ENGINEERING

The P.C. Rossin College of Engineering and Applied Science Healthcare Systems Engineering Master Program (<https://engineering.lehigh.edu/hse/academics-degree-options/master-engineering/>) uses systems modeling and analytics tools coupled with a broad overview of systems of healthcare to enable students to address complex operational challenges. Students encounter a variety of tools, including: project management, engineering economics, statistics and stochastic modeling, operations research and optimization, process flow and queuing, simulation and information systems analysis and design. The program places a strong emphasis on applied learning and professional development, with relevant projects and assignments woven throughout the curriculum. Students enrolled in the 4+1 program associated with the College of Health take four graduate-level courses in COH chosen in consultation with an adviser.

Biostatistics Courses

BSTA 001 Population Health Data Science I 3 Credits

Students will learn the fundamentals of probability theory, univariate statistics, statistical computing/programming/visualization, and machine learning. A mix of traditional and experiential learning will focus on how to build an analysis pipeline to answer pressing questions in population health. In-class examples and projects will use real data sets. Students will propose a small data-driven project focused in population health, and use their newly-acquired data science skills to collect, analyze, and present their work. Must be taken in conjunction with BSTA 002.

Corequisites: BSTA 002

BSTA 003 Computational Thinking 3 Credits

This course introduces computational thinking as a problem-solving methodology in health and biological sciences. You will explore the approach of developing theoretical models for natural events and converting them into computer simulations using tools like R, Python, MATLAB, or SAS. The course emphasizes fundamental programming concepts, making it suitable for beginners, while also highlighting computational thinking in health. Additionally, the course explores ethics in computational science, covering responsible algorithmic decision-making, data management, privacy, bias, and transparency in computing.

BSTA 005 Statistical Literacy in Health 3 Credits

This course is designed to introduce students with a fear of all things mathematical to the importance of statistics in health research. Students will learn how to read and understand basic statistical concepts and methods used in health research, such as probability, sampling, hypothesis testing, and correlation. Students will also learn to interpret tables and statistical findings in the health literature.

BSTA 007 (POPH 007) Frontiers of AI in Health 3 Credits

This course presents a broad contemporary survey of the actual and potential contributions of Artificial Intelligence and Health Data Science in addressing public health challenges. By reading recent articles that describe case studies of AI in health and healthcare and by engaging in discussions both in class and online, students will come to appreciate the many unsolved problems in public health and how one may evaluate the potential benefits and risks of exciting new data-centric solutions made possible by AI.

BSTA 030 Data Exploration in R 3 Credits

This course provides an introduction to problem-solving using the R environment for statistical computing and graphics. Students will gain experience designing, implementing, and testing their R code. Multiple programming paradigms will be explored. The course covers R data types, input and output, and control flow in the context of preparing, cleaning, transforming, and manipulating data. Students will use R to conduct exploratory data analyses, including computing descriptive statistics and data visualization. Students should expect to spend each class writing programs.

Prerequisites: CSE 012

BSTA 040 Data Exploration in Python 3 Credits

This course provides an introduction to the fundamentals of programming in Python. Students will gain experience designing, implementing, and testing their Python code, as well as in using Jupyter Notebooks, and IPython for statistics and data analysis. Multiple programming paradigms will be explored. The course covers Python data types, input, and output, and control flow in the context of preparing, cleaning, transforming, and manipulating data. In addition, students will use Python to conduct exploratory data analyses, including computing descriptive statistics.

Prerequisites: CSE 012

BSTA 101 Population Health Data Science I 3 Credits

This course provides an introduction to the use of statistics in health. Topics include data presentation, descriptive statistics, probability and probability distributions, parameter estimation, hypothesis testing, analysis of contingency tables, analysis of variance, linear and logistic regression models, and sample size and power considerations. Students develop the skills necessary to perform, present, and interpret basic statistical analyses. Must be taken in conjunction with BSTA 102.

Corequisites: BSTA 102

BSTA 102 Population Health Data Science I Algorithms Lab 1 Credit

Students will use a statistical computing platform to apply concepts learned in BSTA 101 and attain autonomy in handling real-world data. Lab must be taken concurrently with lecture (BSTA 101 Population Health Data Science I).

Corequisites: BSTA 101

BSTA 103 Population Health Data Science II 3 Credits

This course is a continuation of BSTA 101. Topics include an overview of generalized linear models, simple and multiple linear regression, regression models for binary data, regression models for count data, quasi-likelihood methods, extensions of generalized linear models. Must be taken in conjunction with BSTA 104. **Prerequisites:** BSTA 101.

Prerequisites: BSTA 101

Corequisites: BSTA 104

BSTA 104 Population Health Data Science II Algorithms Lab 1 Credit

Students will use a statistical computing platform to apply regression techniques learned in BSTA103 Population Health Data Science II to health datasets. Lab must be taken concurrently with lecture (BSTA103 Population Health Data Science II).

Prerequisites: BSTA 101

Corequisites: BSTA 103

BSTA 120 (CGH 120, EPI 120, POPH 120) Independent Study or Research 1-4 Credits

This course can be directed readings or research in Biostatistics or an experiential learning experience that puts student's understanding of Biostatistics into practice. Department permission required.

Repeat Status: Course may be repeated.

BSTA 130 Internship 1-4 Credits

In this introductory course, students will engage in supervised work in Biostatistics. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required, and a preceptor evaluation will be required. Department permission is required.

Repeat Status: Course may be repeated.

BSTA 132 Health Data Science I: Inference 4 Credits

This course provides an introduction to methods of statistical inference as applied to health data. Topics covered include hypothesis testing, confidence intervals, analysis of variance, correlation, and non-parametric methods. The course will illustrate these concepts using data from the health context. In addition to traditional methods of learning, computing will be a significant component of the course, ensuring students acquire the skills to both formulate and answer pressing questions in population health.

Prerequisites: MATH 052 and MATH 043 and BSTA 030

BSTA 133 Health Data Science 2: Regression 4 Credits

This course provides an introduction to generalized linear models as applied to health data. Topics covered include models for binary data, models for nominal and ordinal data, models for count data, quasi-likelihood methods, and Bayesian generalized linear models. The course will illustrate these concepts using data from the health context. In addition to traditional methods of learning, computing will be a significant component of the course, ensuring students acquire the skills to both formulate and answer pressing questions in population.

Prerequisites: BSTA 132

BSTA 141 Health Data Science III: Supervised Machine Learning in Health 4 Credits

Supervised machine learning is used to create automated systems that sift through labeled/continuous data at high speed to make predictions with minimal human intervention. This course provides students with skills in applying supervised machine learning in contexts of population health. We will cover regression, classification, cross-validation, hyperparameter selection, feature selection, feature engineering, ensemble methods, regularization, and reinforcement learning. Students will learn concepts through hands-on engagement with health data sets, preparing them to contribute effectively to data-driven precision population health.

Prerequisites: MATH 052 and MATH 043 and BSTA 040

BSTA 142 Health Data Science IV: Unsupervised Machine Learning in Health 4 Credits

Unsupervised machine learning is used to discover hidden patterns and structures in high-dimensional unlabeled health data. This course will survey leading techniques for clustering and dimensionality reduction. The course will cover hierarchical and density-based clustering techniques, along with modeling using Gaussian mixtures, factor analysis, and principal component analysis. Applications considered will include patient clustering for personalized treatment, anomaly detection for early disease identification, and dimensionality reduction for efficient analysis of diverse and complex medical datasets.

Prerequisites: BSTA 141 and MATH 052 and MATH 043 and BSTA 040

BSTA 150 Special Topics in Biostatistics 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an intermediate level.

Repeat Status: Course may be repeated.

BSTA 160 Biostatistics Study Abroad 1-3 Credits

Biostatistics focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

BSTA 300 Apprentice Teaching 1-4 Credits

Repeat Status: Course may be repeated.

BSTA 308 Advanced R Programming 3 Credits

R language syntax and structure. R programming techniques. Emphasis on structured design for medium to large programs. R package development fundamentals. Capstone development project.

Prerequisites: BSTA 101 and BSTA 103

BSTA 309 Outbreak Science & Public Health Forecasting 3 Credits

This course aims to introduce students to models that describe the spread of a pathogen through a population, and how models can support public health decisions. The course will be split into four parts: (i) the factors that motivate public health actions, (ii) epidemic models such as the Reed-Frost and SIR, (iii) statistical time series and forecasts, (iv) a focus on ensemble building. Students will be expected to complete mathematical/statistical exercises and write code that simulates infectious processes.

Prerequisites: BSTA 101 and BSTA 103

BSTA 310 (CSE 310) Assistive Technologies 3 Credits

This class will introduce typical challenges faced by persons with disabilities and the role of assistive technologies (ATs) in solving such challenges. The class will examine opportunities presented by recent advances in mobile and AI technologies. Working in groups, each student will be expected to acquire and apply relevant skills in designing AT solutions. The class can be taken by students with diverse backgrounds including the following: community and population health, social and behavioral sciences, business, engineering and computer science.

Prerequisites: CSE 017 or (BSTA 101 and BSTA 102)

BSTA 320 (CGH 320, EPI 320, POPH 320) Independent Study or Research in Biostatistics 1-4 Credits

This course can be directed readings or research in Biostatistics or an experiential learning experience that puts student's understanding of Biostatistics into practice. Department permission required.

Repeat Status: Course may be repeated.

BSTA 330 Internship 1-4 Credits

In this advanced course, students will engage in supervised work in Biostatistics. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required, and a preceptor evaluation will be required. Department permission is required.

Repeat Status: Course may be repeated.

BSTA 350 Special Topics in Biostatistics 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

BSTA 360 Biostatistics Study Abroad 1-3 Credits

Upper-level biostatistics focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

BSTA 372 Analyzing Electronic Health Record Data 3 Credits

This course will explain the structure and provide computing skills to analyze Electronic Health Record (EHR) data. Through a series of health-related case studies, students will have the opportunity to experience EHR as a comprehensive platform to support best-in-class evidence-based care and as the core component for big data analytics to help care organizations adapt and transform into learning organizations. The course will present a number of EHR data architectures, data standards, quality assessment, and workflow methods.

Prerequisites: BSTA 142

BSTA 373 Analyzing Clinical Natural Language Data 3 Credits

This course will convey specialized clinical natural language processing (NLP) principles and methods, as well as how to write regular expressions and parse and collate information from text-rich health documents such as electronic health records, clinical notes, and peer-reviewed medical literature. The course will engage real-world data sets for students to develop text-processing strategies. Computing will be a significant component of the course, ensuring students acquire the skills necessary to work with clinical natural language data.

Prerequisites: BSTA 142

BSTA 374 Analyzing Health GIS Data 3 Credits

This course will convey specialized methodologies of data collection and the statistical analysis of spatial data. Through a series of health-related case studies, students will have the opportunity to explore spatial statistical analysis at a variety of spatial resolutions. Computing will be a significant component of the course, ensuring that students acquire the skills necessary to apply these techniques to health-related GIS data.

Prerequisites: BSTA 142

BSTA 375 Analyzing Health Sensor Data 3 Credits

This course will convey specialized methodologies of data collection and the statistical analysis of health-related time-series data collected from sensors. Of particular interest are data generated by environmental sensors, wearable devices, and medical instrumentation. Through a series of health-related case studies, students will have the opportunity to explore signal processing, filtering, modeling, and forecasting techniques. Computing will be a significant component of the course, ensuring that students acquire the skills necessary to apply these techniques to health-related sensor data.

Prerequisites: BSTA 142

BSTA 376 Deep Learning for Healthcare 3 Credits

This course will convey the specialized methods of deep learning in the context of health data. Through health-related case studies, students will learn to engage deep learning models and healthcare applications such as clinical predictive models, computational phenotyping, patient risk stratification, treatment recommendation, and medical imaging analysis. The course will engage with real-world data sets via computing using Jupyter and PyTorch, ensuring that students acquire the skills necessary to apply deep learning techniques to health data.

Prerequisites: BSTA 142

BSTA 381 Analysis of Dependent Data 3 Credits

This course will convey specialized methodologies needed to analyze and model dependent data. By considering dependent data from a series of health-related case studies, students will have the opportunity to explore different types of statistical association, random effects models, generalized estimating equations, copula models, and nonparametric methods for dependent data. Computing will be a significant component of the course, ensuring that students acquire the skills necessary to carry out a wide range of analyses of health-related dependent data.

Prerequisites: BSTA 133

BSTA 383 Survival Analysis 3 Credits

This course will present methodologies needed to model time-to-event data. By considering censored (i.e., incomplete) health data from a series of case studies, students will explore nonparametric estimation (e.g., life table methods, Kaplan-Meier estimator), nonparametric methods for comparing the survival experience of populations, and semiparametric and parametric methods of regression for censored outcome data. Computing will be a significant component of the course, ensuring students acquire the skills necessary to conduct time-to-event analyses of health-related data.

Prerequisites: BSTA 133

BSTA 384 Network Analysis 3 Credits

This course will convey specialized methodologies needed to analyze and model network data. By considering relational data from a series of health-related case studies, students will have the opportunity to explore mathematical description of networks, social network measures, exponential random graph models of networks, network sampling, and visualization. Computing will be a significant component of the course, ensuring that students acquire the skills necessary to carry out a wide range of network-based analyses of health-related data.

Prerequisites: BSTA 133

BSTA 386 Bayesian Analysis 3 Credits

This course will provide a basic introduction to Bayesian concepts and methods with an emphasis on the data analysis in the context of health. We will discuss model choice, including the assessment of prior distributions. We will discuss how to conduct inference in a Bayesian setting, through posterior means, credible intervals and hypothesis testing. The Analyses will be performed using the freely available software Jags as implemented in the R packages rjags and R2jags.

Prerequisites: BSTA 133

BSTA 387 Analyzing Data in SAS 3 Credits

This course will introduce the student to the SAS programming language in a lab-based format. The objective is for the student to develop programming and statistical computing skills to address data management and analysis issues using SAS. The course will also provide a survey of some of the most common data analysis tools in use today and provide decision-making strategies in selecting the appropriate methods for extracting information from data.

Prerequisites: BSTA 133

BSTA 396 1-4 Credits

Repeat Status: Course may be repeated.

BSTA 399 Portfolio Project 1 Credit

This course will must be taken concurrently with an elective in either the Data or Methods clusters of the program. Students must inform the instructor for the associated elective about their registration in the Portfolio Project course. Portfolio Project students may be assigned additional material/assignments, and will be required to complete a significant report in the associated elective course.

BSTA 402 Biostatistics in Health 3 Credits

This course provides an introduction to the use of statistics in health. Topics include descriptive statistics, probability distributions, parameter estimation, hypothesis testing, analysis of contingency tables, analysis of variance, regression models, and sample size and power considerations. Students develop the skills necessary to perform, present, and interpret statistical analyses; and attain autonomy in handling real-world data using a statistical computing environment.

BSTA 403 Health Applications in Statistical Learning 3 Credits

This course will explore common statistical models used to analyze both continuous, discrete, and time to event data: simple and multivariate linear regression, logistic regression, poisson and negative binomial regression, and survival models. An emphasis will be placed on supervised learning. Throughout the semester, students will apply the theoretical background they learn in class to population health data sets, generating their own hypotheses and testing them with rigorous statistical methods.

Prerequisites: BSTA 402

BSTA 404 Data Architecture, Mining, and Linkage 3 Credits

This course will focus on collecting, storing, and formatting data for use in population health data analysis. Students will learn fundamental concepts and best practices for working with data, how to use Python to scrape the internet for data related to population health and learn how to link a diverse set of data together to test novel hypotheses students themselves pose during class.

BSTA 409 Outbreak Science & Public Health Forecasting 3 Credits

This course aims to introduce students to models that describe the spread of a pathogen through a population, and how models can support public health decisions. The course will be split into four parts: (i) the factors that motivate public health actions, (ii) epidemic models such as the Reed-Frost and SIR, (iii) statistical time series and forecasts, (iv) a focus on ensemble building. Students will be expected to complete mathematical/statistical exercises and write code that simulates infectious processes.

BSTA 410 (CSE 410) Assistive Technologies 3 Credits

This class will introduce typical challenges faced by persons with disabilities and the role of assistive technologies (ATs) in solving such challenges. The class will examine opportunities presented by recent advances in mobile and AI technologies. Working in groups, each student will be expected to acquire and apply relevant skills in designing AT solutions. The class can be taken by students with diverse backgrounds including the following: community and population health, social and behavioral sciences, business, engineering and computer science.

BSTA 420 (CGH 420, POPH 420, PUBH 420) Independent Study or Research in Biostatistics 1-4 Credits

This course can be directed readings or research in Biostatistics or an experiential learning experience that puts student's understanding of Biostatistics into practice. Department permission required.

Repeat Status: Course may be repeated.

BSTA 450 Special Topics in Biostatistics 3 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

Community and Global Health Courses**CGH 001 Community Health 3 Credits**

The interdisciplinary field of community health focuses on improving the health of communities through health promotion and disease prevention, education, policy development, and community empowerment. This course provides students with an overview of theoretical, methodological, and practical aspects of community health with a focus on working in diverse communities. Students will gain an understanding of how community-level health issues relate to broader contextual issues within the community and externally.

CGH 002 Introduction to LGBTQ2+ Health 3 Credits

This course introduces students to the health of lesbian, gay, bisexual, transgender, queer/questioning, and and two-spirited (LGBTQ2+) populations in the United States and globally. Using an interdisciplinary approach, the course focuses on determinants of health, LGBTQ2+ health disparities, the history of LGBTQ2+ health, and major health issues faced by LGBTQ2+ people across the lifespan. Students explore individual, interpersonal, organizational, community, and policy influences on LGBTQ2+ health, as well as LGBTQ2+ affirming health policies, programs, and services.

Repeat Status: Course may be repeated.

Prerequisites: CGH 001 or POPH 001

Can be taken Concurrently: CGH 001, POPH 001

Attribute/Distribution: DEIN

CGH 004 Introduction to Global Health 3 Credits

In this course, students will receive an introduction to global population health. We begin with an analysis of the rise of the international community in addressing population health needs, and the international norms guiding healthcare delivery systems. We will also focus on healthcare delivery systems, innovations, and policy reforms in response to healthcare needs in several developing nations. Finally, students will understand the political, social, and more recent commercial determinants of population health in these countries.

CGH 007 Seven Dimensions of Health & Wellness 0,3 Credits

Much has been discussed in the public sphere about happiness and how an individual can achieve peak happiness. This course delves more holistically into health and wellness, moving beyond individual happiness and towards a multi-level understanding of how interactions with others and the environment impact the self. Using a multi-disciplinary approach, students will learn the seven dimensions of health and wellness, including physical, mental, emotional, spiritual, cultural, environmental, and community, and how they interact to create healthy people and communities.

CGH 016 Seminar: Cultural Understanding and Health 1 Credit

This course will introduce students to the basic perspectives and skills needed to work with peoples and communities other than their own in a cross-cultural setting. An introductory understanding of culture and the components of culture, such as values, beliefs, language, and world view, will be explored specifically in relation to health and health outcomes at the individual and community-levels.

CGH 021 Culture and Health 3 Credits

This course will introduce students to the complex and dynamic relationship between culture and health in Western and non-Western populations, communities, and societies. Cross-cultural institutions such as economics, politics, kinship, religion, and language, and their roles in sickness and illness will be discussed. The relationship between traditional and modern healing systems will also be analyzed.

CGH 022 Global Perspectives on Health 3 Credits

This course is designed to introduce students to the inequalities and systems of stratification various industrialized and non-industrialized peoples and cultures around the world face when it comes to their health and wellness. Critical theoretical perspectives will be utilized, as will case studies of health inequities and inequalities, to examine connections between health and cultural and social factors such as race, ethnicity, socio-economic status, and gender. Current global trends in addressing these inequities and inequalities will also be explored.

CGH 101 Careers in Community and Global Health Studies 3 Credits

In this interdisciplinary seminar, students will be exposed to individuals working in community and global health in academic positions, government and non-governmental organizations, community-based organizations, medical establishments, industry, and more. Through the eyes of these professionals, students will learn of career opportunities in these growing fields of study and will begin to chart their own career paths.

CGH 102 (CEE 102) Community Health and Engineering 3 Credits

This course is an introduction to public health engineering. Students will learn to define hazards and risks to community health such as air pollution; water, sanitation, and hygiene; food; and settlement/safety. The focus of the course will be on understanding engineering controls to reduce risk and improve communicable and non-communicable disease outcomes. This course includes elements of waterborne disease control, hazardous materials management, occupational health and safety, and environmental interventions.

CGH 103 Biological & Environmental Determinants of Health 4 Credits

This course provides students with a foundational knowledge of the biological mechanisms underlying health and disease. Students will learn about the evolutionary genetic basis of disease and the major disease transitions throughout history, all driven by interactions between the genetic composition of individuals and groups and their natural and built environment. Students will become familiar with the various infectious agents causing disease and the human immune response, as well as the biological determinants of chronic diseases. Not for biology majors.

CGH 104 Sociocultural & Political Determinants of Health 4 Credits

This course will look at cultural, social, and political institutions, as well as other components of culture, society, and social structure, that affect health and the health outcomes at the individual and community-levels. Topics to be analyzed include cultural traditions, social norms, politics, laws and policies, economics, housing, transportation, and subsistence strategies, just to name a few. Additionally, specific illnesses, sicknesses, and diseases linked to cultural, social, and political institutions in the human experience will be explored.

CGH 105 Commercial Determinants of Health 4 Credits

In this course, students will learn about the role that major soda and ultra-processed food industries play in affecting public health outcomes and policy-making processes. Carefully examining the cases of the United States and developing nations, this course reveals how and why these industries influence consumption patterns in different communities, how government, civil society, and the international community is responding, and the various strategies used by industry to influence policy decisions in their favor.

CGH 106 Qualitative Methods in Health Research 3 Credits

This course is designed to give students a basic understanding of qualitative data collection and analysis methods used in community and global health research. Students will learn about data collection using participation and observation, interviews, and focus groups. Students will also learn about text analysis and presenting qualitative results. This course is not designed to provide an in-depth examination of these methods or practical experience, but rather an introduction to their uses and how they complement quantitative methods.

CGH 107 What is the US Healthcare Ecosystem? 3 Credits

This course examines the structure, functioning, financing, and performance of the U.S. healthcare system. It aims to provide a general overview of the relationships between healthcare consumers, providers, organizations, payers, and regulators. The course will cover the history of the U.S. healthcare system and the political and social environment in which it exists and compare it to systems from other countries.

CGH 108 Food Justice 3 Credits

This course examines community and population health nutrition through the lens of social and environmental justice to examine the cultural, political, and social contexts of food in the United States. Students will engage with case studies, personal experiences with food, guest speakers, and debates on critical policy issues in nutrition and food access. This course will help students to understand the complex relationship between food systems and health and offers insight into practices and movements for sustainability, sovereignty, and equity.

Prerequisites: CGH 001

CGH 109 Introduction to Health Education 3 Credits

This course introduces the major theories and models of health education at multiple levels (individual, interpersonal, organizational, community, and public policy). Particular focus will be put on the introduction, analysis, and application of health behavior theories to health promotion and education practice. The theories to be discussed will provide students with frameworks for understanding health behavior change and designing effective health education programs and interventions.

Prerequisites: CGH 001

CGH 110 Coaching Towards Joy, Meaning, and Social Change 4 Credits

In this course you will learn and practice professional coaching techniques as one way to create meaning, increase your well-being, move towards what you want to achieve and who you want to be. You will learn to coach within and across your different identities/positionalities and consider how this self-work contributes to social change and challenges oppression. The course is well-suited for students interested in peer advising, activism, mentoring and leadership in any area.

CGH 120 (BSTA 120, EPI 120, POPH 120) Independent Study or Research in Community and Global Health 1-4 Credits

This course can be directed readings or research in Community and Global Health or an experiential learning experience that puts the student's understanding of Community and Global Health into practice. Topics addressed will be at an intermediate level. Department permission required.

Repeat Status: Course may be repeated.

CGH 122 Indigenous Healing Traditions 3 Credits

In this course, students will be introduced to the healing traditions of the Indigenous peoples of the Americas. Special attention will be paid to the Native peoples and nations of the United States. Traditional Indigenous perspectives of wellness and unwellness will be explored, as well as healing rites, rituals and ceremonies from Pre-Contact times to the present-day. Indigenous health and healing in the context of colonization and the introduction of Old World diseases will also be discussed.

CGH 130 Internship in Community and Global Health 1-4 Credits

In this introductory course, students will engage in supervised work in Community and Global Health. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations and the private sector. A written report is required and preceptor evaluation will be required. Department permission required.

Repeat Status: Course may be repeated.

CGH 150 Special Topics in Community and Global Health 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an intermediate level.

Repeat Status: Course may be repeated.

CGH 151 Special Topics in Indigenous Peoples Health 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an intermediate level.

Repeat Status: Course may be repeated.

CGH 160 Community & Global Health Study Abroad 1-3 Credits

Community and Global Health focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

CGH 300 Apprentice Teaching 1-4 Credits

Repeat Status: Course may be repeated.

CGH 301 Community and Global Health Field Experience I 1-3 Credits

With the assistance of their advisor, students identify a community internship or field experience site domestically or internationally and write a proposal for the experience and accompanying deliverable and capstone report. The deliverable should be an artifact (e.g., health promotion materials, website, presentation of data, etc.) that the student provides to the site and is agreed upon by the student, advisor, and internship site. A capstone report documents the experience, which should align with the student's concentration and career plans.

Repeat Status: Course may be repeated.

CGH 302 Community & Global Health Field Experience II 1-3 Credits

In this course, students will implement their field experience, including deliverable and capstone report, proposed in CGH 301. The deliverable will be presented to the field site in both written and oral form. The capstone report will be submitted to the student's advisor and will be accompanied by an oral presentation to CGH students and faculty. A field site preceptor evaluation will be required. This course must be taken concurrently with or after CGH 301.

Repeat Status: Course may be repeated.

Prerequisites: CGH 301

Can be taken Concurrently: CGH 301

CGH 303 Honors Community and Global Health Field Experience I 1-4 Credits

Students identify a community internship or field experience site domestically or internationally, write a proposal for the experience and accompanying deliverable and capstone report. Deliverable is an artifact (e.g., health promotion materials, website, presentation of data, etc.) that the student provides and is agreed upon by the student, advisor, and site. The capstone report documents the experience. This course includes a weekly honors seminar, minimum major GPA 3.5 required. Students are required to complete 4 credits of this course.

Repeat Status: Course may be repeated.

CGH 304 Honors Community and Global Health Field Experience II 1-4 Credits

Students implement their field experience, including deliverable and capstone report, proposed in CGH 303. The deliverable is presented to the field site in both written and oral form. The capstone report is submitted to the student's advisor and accompanied by an oral presentation to CGH students and faculty. A field site preceptor evaluation is required. This course includes a weekly honors seminar, minimum GPA 3.5 in major required. Students are required to complete 4 credits of this course.

Repeat Status: Course may be repeated.

Prerequisites: CGH 303

Can be taken Concurrently: CGH 303

CGH 305 Advanced Qualitative Methods in Community and Global Health 3 Credits

This course, designed to be taken after Introductory Methods in Community and Global Health, focuses on the practical application of qualitative data collection and analysis techniques learned in the introductory course in qualitative methods within the context of applied health research. Students will design and conduct a qualitative health study. Students will also be exposed to advanced techniques in qualitative research, such as ethnography, visual methods, computer-assisted analysis, and more.

Prerequisites: CGH 106

CGH 306 Mixed Methods in Health Research 3 Credits

Students in this course will be introduced to ways in which qualitative and quantitative data can be integrated to capture a broader perspective and answer more complex research questions than either will provide alone. The course will cover formulating mixed methods research questions, collecting and analyzing different types of data, analysis across multiple mixed data sets, choosing appropriate mixed methods designed for both qualitatively- and quantitatively-driven studies, and interpreting mixed methods results.

Prerequisites: CGH 106 and BSTA 001

CGH 307 Health Survey Research Methods 3 Credits

In this course, students will explore and apply the foundational concepts and methods related to survey design and implementation. Students will be introduced to such concepts as sampling theory, question design and ordering, methods of survey data collection, bias and error in survey research, measure development and validation, and data preparation for analysis. Students will be exposed to several national health surveys, as well as surveys designed for smaller scale use.

Prerequisites: POPH 001 or CGH 001

CGH 308 Community Health Intervention Design 3 Credits

This course is designed to introduce students to development, implementation, and evaluation of health-related programs and interventions in community settings. Students will learn the theoretical foundations of intervention design and will examine evidence-based programs from multiple fields of study. Students will be introduced to aspects of intervention design such as cultural appropriateness, individual tailoring, health literacy issues, sustainability, and more.

Prerequisites: POPH 001 or CGH 01

CGH 309 Ethnomedical Traditions of the Americas 3 Credits

This course will introduce students to the rich and diverse ethnomedical traditions of various peoples and cultures in North, Central, and South America and the Caribbean. Indigenous, African-Diasporic, European, and Asian ethnomedical traditions will be discussed. The manners in which these ethnomedical systems diagnose and treat individuals will be explored, as well as the ways they compare to mainstream allopathic medicine. Topics commonly associated with ethnomedicine, such as herbalism, ritualized healing, and altered states of consciousness, will also be investigated.

CGH 310 Rural Communities and Health in the United States 3 Credits

This course is designed to allow students to examine health at the individual and community levels in rural America. Special attention will be paid to individuals and communities that engage in economic activities connected to rural America – ranching, farming, and natural resource extraction. In addition, populations who reside primarily in rural areas, both mainstream and non-mainstream, will be investigated. The health problems, health outcomes, access to health care, and alternative treatments will be explored.

CGH 311 Religion, Spirituality, and Health 3 Credits

This course will examine the complex and dynamic relationships among religion, spirituality, and health. Religion's and spirituality's roles in health promotion and disease prevention will be explored at the individual and community-levels. Social science and biomedical perspectives will be utilized to understand these relationships, as well as the perspectives of practitioners from numerous Western and Non-Western religious and spiritual traditions.

Prerequisites: POPH 001 or CGH 001

CGH 312 Curses, Possessions, and Supernatural Illnesses 3 Credits

In this course students will utilize a community health perspective to investigate the causes, symptoms, and treatments, as well as the roles, supernatural illnesses play in Western and Non-Western communities around the world. Supernatural illnesses associated with curses, hexes, ghosts, malevolent entities, and the spirit world will be examined. The cultural, social, economic, political, and legal effects these illnesses have on afflicted individuals, their families, and the communities in which they live will also be explored.

Prerequisites: POPH 001 or CGH 001

CGH 313 Health Policy and Politics 3 Credits

In this course, students learn the various methods as well as conceptual and analytical frameworks involved in the policy-making and the political processes involved. Issues of policy agenda-setting, policy diffusion, policy formulation, and implementation will be addressed, ultimately going through the 'entire' policy-making process. Concepts and methods in political science will be introduced as well as their application to health policy-making. This module will close with several case study illustrations from the United States and around the world.

CGH 314 Advanced Commercial Determinants of Health 3 Credits

In this upper-level course, students will learn the roles that major soda, food, tobacco, entertainment, and pharmaceutical industries play in affecting population health. This course reveals how and why these industries influence consumption, mental health, and social interactions within communities; how government, civil society, and the international community is responding; and industry's strategic response. This course is reading and writing intensive and employs comparative qualitative case study methods and analysis.

Prerequisites: CGH 105

CGH 315 Medical Mysteries 3 Credits

Everything is a mystery until it is solved, including in medicine. This course begins with an exploration of historical medical mysteries and discussion of what happened after they were solved as a foundation for understanding the present. Students will then learn what differential diagnosis is and what happens when it leaves you with nothing. The course culminates in an examination of a series of current medical mystery case studies in the realms of physical, mental, and spiritual health.

Prerequisites: CGH 103

CGH 316 Global Environmental Disasters & Policy 3 Credits

Disasters can leave individuals, communities, and nations reeling to pick up the pieces. This course will look at case studies of major global disasters, including those created by people and nature, and the global magnitude of these disasters. Students will analyze disaster preparedness policies enacted in response to these disasters and learn about the inequalities that disproportionately impact marginalized communities in the aftermath.

Prerequisites: CGH 103 and (POPH 001 or CGH 001)

CGH 317 Sex, Drugs, and Trauma 3 Credits

This course will explore health issues existing at the intersection of mental and sexual health. The course will focus on overlapping experiences of sex, sexuality, drug use, and both individual and structural violence. Applying a social justice lens, we will examine health inequities within these intersections as well as strategies to ameliorate inequities and to help heal individuals and communities. Students will be introduced to trauma-informed approaches, advocacy efforts, and the role of storytelling and the arts.

Prerequisites: CGH 104

CGH 318 Sexuality Education 3 Credits

This course explores issues and controversies surrounding the provision of school-based sexuality education in the United States. Students critically review evidence-based programs, professional guidelines, federal and state policies, as well as political and community forces that impact classroom instruction. Students also learn, through interactive activities and classroom discussion, how to design age-appropriate, medically accurate, trauma-informed, sex-positive, LGBTQ+ inclusive, and culturally responsive sexuality education programs.

Prerequisites: CGH 001 or POPH 001

CGH 319 Public Health Law 3 Credits

This course will explore the legal principles of public health. It will cover laws currently on the books and implementation problems in the highly politicized and culturally sensitive context of health and behavior. Topics include the public health powers, duties, and limitations of authorities and the epidemiological influence of law on health and health behavior. It will also cover how health is socially constructed and how legal responses to health and wellbeing complicate efforts to promote public health.

Prerequisites: CGH 104

CGH 320 (BSTA 320, EPI 320, POPH 320) Independent Study or Research in Community and Global Health 1-4 Credits

This course can be directed readings or research in Community and Global Health or experiential learning that puts the student's understanding of Community and Global Health into practice. Topics addressed will be at an advanced level. Department permission required.

Repeat Status: Course may be repeated.

CGH 322 Contemporary Indigenous Health 3 Credits

In this course, students will learn about the health issues Indigenous peoples of the Americas and their communities presently face. Prevalent diseases will be explored, as well as social, economic, and political issues affecting access to treatment and care. Historical and contemporary laws and policies affecting Indigenous health will also be analyzed. Additionally, Indigenous responses to contemporary health concerns will be explored including decolonization, food sovereignty, and cultural reclamation.

CGH 330 Internship in Community and Global Health 1-4 Credits

In this advanced course, students will engage in supervised work in Community and Global Health. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required and preceptor evaluation will be required. Department permission required.

Repeat Status: Course may be repeated.

CGH 331 Healthcare Finance 3 Credits

This foundation course will introduce students to the key financial management principles, concepts and techniques as applied to health services organizations. This course will cover financial analysis and reporting, revenue sources and reimbursement methods, working capital management, revenue cycle management, and capital budgeting techniques used in the healthcare industry.

Prerequisites: CGH 001 or POPH 001

CGH 332 Aging, Health, and Social Policy 3 Credits

This course describes and evaluates the health and social policy consequences of population aging in the U.S. and abroad. The course begins with an exploration of global trends in aging, longevity, and health. Next, we examine cross-national responses to population aging with case studies from higher, middle, and lower income countries.

Prerequisites: CGH 001 or POPH 001

CGH 334 Cross-National Comparisons of Health Systems & Policy 3 Credits

Countries around the world face a range of common problems in their public health and health care systems. These include demographic and technological changes, budget pressures, and inequalities in health and access to health care services. Policy responses to these common challenges. We will examine the health policy responses of higher and lower income nations and seek to explain why nations differ in their policy choices while exploring the pros and cons of these approaches.

Prerequisites: CGH 001 or POPH 001

CGH 335 Healthcare Operations Management 3 Credits

This course examines opportunities for operational improvement in healthcare organizations. It offers a broad survey of the concepts, techniques, and tools involved in designing and managing efficient and effective processes in healthcare settings. Topics covered include balanced scorecard, project management, decision analysis, performance improvement, capacity management, and inventory management.

Prerequisites: CGH 001 or POPH 001

CGH 350 Special Topics in Community and Global Health 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

CGH 351 Special Topics in Indigenous Peoples Health 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

CGH 375 (EDUC 375, HMS 375) Community Based Participatory Research Methodology 3-4 Credits

The course provides an introduction to the core concepts of community based participatory research (CBPR) methodology applied to social science research to address public health issues. The course will equip students with strategies for developing community academic partnerships as well as to strengthen skills in research methods.

Attribute/Distribution: SS

CGH 414 Advanced Commercial Determinants of Health 3 Credits

In this upper-level course, students will learn the roles that major soda, food, tobacco, entertainment, and pharmaceutical industries play in affecting population health. This course reveals how and why these industries influence consumption, mental health, and social interactions within communities; how government, civil society, and the international community is responding; and industry's strategic response. This course is reading and writing intensive and employs comparative qualitative case study methods and analysis.

Prerequisites: CGH 105

CGH 418 Sexuality Education 3 Credits

This course explores issues and controversies surrounding the provision of school-based sexuality education in the United States. Students critically review evidence-based programs, professional guidelines, federal and state policies, as well as political and community forces that impact classroom instruction. Students also learn, through interactive activities and classroom discussion, how to design age-appropriate, medically accurate, trauma-informed, sex-positive, LGBTQ+ inclusive, and culturally responsive sexuality education programs.

CGH 420 (BSTA 420, POPH 420, PUBH 420) Independent Study or Research in Community and Global Health 1-3 Credits

This course can be directed readings or research in Community and Global Health or experiential learning that puts the student's understanding of Community and Global Health into practice. Topics addressed will be at an advanced level. Department permission required.

Repeat Status: Course may be repeated.

CGH 430 Internship in Community and Global Health 1-3 Credits

In this advanced course, students will engage in supervised work in Community and Global Health. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required and preceptor evaluation will be required. Department permission required.

Repeat Status: Course may be repeated.

CGH 431 Healthcare Finance 3 Credits

This foundation course will introduce students to the key financial management principles, concepts and techniques as applied to health services organizations. This course will cover financial analysis and reporting, revenue sources and reimbursement methods, working capital management, revenue cycle management, and capital budgeting techniques used in the healthcare industry.

CGH 435 Healthcare Operations Management 3 Credits

This course examines opportunities for operational improvement in healthcare organizations. It offers a broad survey of the concepts, techniques, and tools involved in designing and managing efficient and effective processes in healthcare settings. Topics covered include balanced scorecard, project management, decision analysis, performance improvement, capacity management, and inventory management.

CGH 450 Special Topics in Community and Global Health 3 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

CGH 497 1-3 Credits

Repeat Status: Course may be repeated.

Epidemiology Courses**EPI 104 Fundamentals of Epidemiology 3 Credits**

Introduces epidemiology and its application in public health. Addresses basic epidemiologic terminology and definitions. Presents public health problems in terms of magnitude, person, time, place, and disease frequency. Examines correlation measures between risk factors and disease outcomes; strengths and weaknesses of standard epidemiologic study designs; and ethical and legal issues related to epidemiologic data. Students calculate basic epidemiology measures, draw inferences from epidemiologic reports, and use information technology to access, evaluate, and interpret public health data.

Prerequisites: POPH 002

EPI 120 (BSTA 120, CGH 120, POPH 120) Independent Study or Research 1-4 Credits

This course can be directed readings or research in Epidemiology or an experiential learning experience that puts students' understanding of Epidemiology into practice. Department permission is required.

Repeat Status: Course may be repeated.

EPI 130 Internship 1-4 Credits

In this introductory course, students will engage in supervised work in Epidemiology. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required, and a preceptor evaluation will be required. Department permission is required.

Repeat Status: Course may be repeated.

EPI 150 Special Topics in Epidemiology 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an intermediate level.

Repeat Status: Course may be repeated.

EPI 160 Epidemiology Study Abroad 1-3 Credits

Epidemiology focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

EPI 300 Apprentice Teaching 1-4 Credits

Instructor permission required.

Repeat Status: Course may be repeated.

EPI 305 Intermediate Epidemiology 3 Credits

This course offers a deeper, expanded view of concepts and methods for observational epidemiological studies. Experiential learning activities and data collection give students opportunities to apply concepts learned in EPI 104. Topics include environmental, molecular, and genetic epidemiology, descriptive methods, analytic study designs (ecologic, cross-sectional, cohort, and case-control studies), confounding, and effect modification. Includes the use of multivariable models to adjust for confounding effects. Deeper concepts in causal inference are examined through the use of directed acyclic graphs.

Prerequisites: EPI 104 and (BSTA 133 or (BSTA 103 and BSTA 104),)

EPI 306 Lifecourse Epidemiology 3 Credits

This course provides students a foundation for understanding the terminology and theoretical framework used in life course epidemiology and family health services research; biobehavioral pathways by which early life experiences impact health across the life course; data sources, study designs, and statistical approaches used in lifecourse epidemiology and family health services research; and implications for clinical and public health practice, policy, and health system development with an eye towards development of effective and sustainable life course interventions.

Prerequisites: POPH 001

EPI 308 Spatial Epidemiology 3 Credits

This course will provide students with an introduction to Geographic Information Systems (GIS) and its application in population health. It is primarily intended for students in Population Health, but students from other programs will also get good exposure to the capabilities of GIS in health science. The course is designed to teach a mix of practical skills and fundamental concepts. The first half focuses on basic skills and concepts, while the second half focuses on using GIS for analysis.

Prerequisites: EPI 304

EPI 309 Chronic Disease Epidemiology 3 Credits

This course explores the epidemiology of common chronic diseases, including cardiovascular, cancer, metabolic, musculoskeletal, neurologic and others. Major risk factors include tobacco use, diet and nutrition, physical inactivity, and alcohol use. For each chronic disease we will review the significance of the chronic disease by describing the health disparities across various demographic groups as well as discuss the major risk factors attributed to the disease. Finally, students will critique evidence-based interventions from the published literature.

Prerequisites: EPI 104

EPI 310 Environmental Epidemiology & Exposure Science 3 Credits

Environmental epidemiology examines the associations of diseases with occupational exposures and other environmental risk factors. Exposure science is the study of contact between humans and environmental risk factors, and it plays a fundamental role in the development and application of epidemiology, toxicology, and risk assessment. This course aims to engage students to understand the relationship between environmental exposure and human health, learn how to conduct exposure assessments, and know the application to promote and protect human health.

Prerequisites: EPI 304

EPI 311 Psychiatric Epidemiology and Global Mental Health 3 Credits

This course examines global mental health through the lens of psychiatric epidemiology and cultural psychiatry. It utilizes a life course framework to understand the bio-psycho-social determinants of mental health and global burden of mental disorders throughout the lifespan. Students will explore mental health and illness with an emphasis on culture, diversity, and social inclusion. Focus is placed on exploring diverse cultural conceptualizations and presentations of mental health and illness and implementing culturally appropriate prevention and intervention programs.

Prerequisites: EPI 104

EPI 320 (BSTA 320, CGH 320, POPH 320) Independent Study or Research 1-4 Credits

This course can be directed readings or research in Epidemiology or an experiential learning experience that puts students' understanding of Epidemiology into practice. Department permission is required.

Repeat Status: Course may be repeated.

EPI 330 Internship 1-4 Credits

In this advanced course, students will engage in supervised work in Epidemiology. Placements will be arranged to suit individual interests and career goals. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required, and a preceptor evaluation will be required. Department permission is required.

Repeat Status: Course may be repeated.

EPI 350 Special Topics in Epidemiology 3-4 Credits

In this course, students will explore the substantive and methodological concepts related to a specific Epidemiology content area. Examples may include Lifecourse Epidemiology, Molecular Epidemiology, and Infectious Disease Epidemiology.

Repeat Status: Course may be repeated.

EPI 360 Epidemiology Study Abroad 1-3 Credits

Upper-level epidemiology-focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

EPI 404 Methods in Epidemiology I 3 Credits

This course addresses advanced epidemiologic terminology and definitions. Presents public health problems in terms of magnitude, person, time, place, and disease frequency. Examines and critiques correlation measures between risk factors and disease outcomes; strengths and weaknesses of standard epidemiologic study designs; and ethical and legal issues related to epidemiologic data. Students calculate basic epidemiology measures (rates, Odds Ratios, Relative Risks, and others), draw inferences from epidemiologic reports, and use information technology to access, evaluate, and interpret public health data.

EPI 405 Methods in Epidemiology II 3 Credits

This course investigates complicated questions in epidemiology providing a deeper, expanded view of concepts and methods for observational epidemiological studies. Through experiential learning and data collection, students apply concepts learned in EPI 404, analyze primary data, write epidemiological reports. Topics include confounding, effect modification, cohort studies, case-control study variants, analytical methods. Students use multivariable models to model relationships between risk factors and health outcomes while adjusting for confounding effects. Deeper concepts in causal inference examined through directed acyclic graph use.

Prerequisites: EPI 404

EPI 411 Psychiatric Epidemiology and Global Mental Health 3 Credits

This course examines global mental health through the lens of psychiatric epidemiology and cultural psychiatry. It utilizes a life course framework to understand the bio-psycho-social determinants of mental health and global burden of mental disorders throughout the lifespan. Students will explore mental health and illness with an emphasis on culture, diversity, and social inclusion. Focus is placed on exploring diverse cultural conceptualizations and presentations of mental health and illness and implementing culturally appropriate prevention and intervention programs.

EPI 450 Special Topics in Epidemiology 3 Credits

In this course, students will engage in an intensive exploration of the substantive and methodological concepts related to a specific Epidemiology content area. Examples may include Lifecourse Epidemiology, Molecular Epidemiology, and Infectious Disease Epidemiology.

Repeat Status: Course may be repeated.

Health Innovation Technology Courses**HIT 010 Seminar: Design Thinking for Innovation in Health 1 Credit**

Design Thinking is a human centered design process used to identify problems and create actionable solutions. Students will be exposed to the process, and attitudes needed, to frame and reframe problems, challenge assumptions, access their creativity, and tell compelling stories to communicate their ideas. The emphasis is on learning by doing and focuses on practicing the 5 steps in Design Thinking: Empathize, Define, Ideate, Prototype, Test that can be applied to virtually any area where new solutions are needed.

Population Health Courses**POPH 001 Introduction to Population and Public Health 4 Credits**

Despite significant advances in medicine and public health, inequities in health persist. Understanding health on a population level is an approach that seeks to improve the health of the whole population, unravel variations in health outcomes, and to identify effective strategies for reducing or eliminating inequities. The purpose of this course is to provide students with an understanding of: 1) how population and public health are defined and measured; and 2) the determinants of population health.

POPH 002 Population Health Research Methods & Application 4 Credits

This course provides students with fundamental principles of research methods relevant to population health and the translation of research into practice. Through this course, we will review a range of study designs, including experimental and observational studies, mixed methods, and comparative qualitative case study methods. In addition, students will obtain the skills needed to translate research into practice for multiple stakeholder groups.

Prerequisites: POPH 001

POPH 003 Justice, Equity, and Ethics in Population Health 3 Credits

The goal is to examine the historical and emerging issues in population health ethics. The course will introduce both the historical contexts and contemporary issues in population health dilemmas. Topics of interest include: 1) resource distribution and social justice; 2) self-sufficiency and paternalism; 3) health promotion & disease prevention; 4) patients' right to privacy; 5) research integrity; and 6) newly emerging issues. Students will debate, research, and propose solutions and intervention strategies through group discussions, role play, and presentations.

POPH 007 (BSTA 007) Frontiers of AI in Health 3 Credits

This course presents a broad contemporary survey of the actual and potential contributions of Artificial Intelligence and Health Data Science in addressing public health challenges. By reading recent articles that describe case studies of AI in health and healthcare and by engaging in discussions both in class and online, students will come to appreciate the many unsolved problems in public health and how one may evaluate the potential benefits and risks of exciting new data-centric solutions made possible by AI.

POPH 010 Seminar: Population Health 1 Credit

This one-credit special topics seminar will focus on the development of Population Health relevant skills in the areas of communication, professional development, mentorship and leadership, proposal development, policy and advocacy and community engagement and coalitions.

Repeat Status: Course may be repeated.

POPH 012 Seminar: Ethics in Population Health 1 Credit

This seminar will introduce students to ethical concepts and critical issues pertaining to the ethical inclusion of human subjects in population health research. This course will provide opportunities for writing about, discussion of, and case-based learning around current and historical perspectives on population health research. During this course, students will complete the necessary training for conducting human subjects research at Lehigh University.

POPH 101 History of Population Health 3 Credits

This course introduces students to the development of population health as a convergent science. Students will learn about the evolution of population health interests, normative beliefs in service delivery, and policy at the international and domestic level. The principles, ethical values and services enforced by law will be learned. Students will explore the initiatives, collectively achieved among various sectors, addressing the determinants of health. We conclude by addressing future population health challenges, such as the environment, non-communicable diseases, and inequalities.

POPH 104 Careers in Population Health 3 Credits

In this interdisciplinary seminar, students will be exposed to individuals working in various disciplines within the field of population health in academic positions, government and non-governmental organizations, community-based organizations, medical establishments, industry, and more. Through the eyes of these professionals, students will learn of career opportunities in these growing fields of study and will begin to chart their own career paths.

POPH 105 Introduction to Maternal and Child Health 3 Credits

The course introduces the student to the Maternal and Child Health field. Students will examine the multi-dimensional determinants of maternal and child health issues using a Life Course approach. Students will also explore the roles of research, programs, policy, and advocacy in the reduction of maternal and child health disparities.

POPH 106 Global Environment and Human Welfare 3 Credits

This course investigates the present understanding of multiple pollution agents and their effects on human health and well-being. The students will examine the history, the emergence, the known risks from exposure to specific pollutants through multiple media (e.g. air, water, food) with a particular focus on air pollution. Through readings, discussions, and a project, students are expected to cultivate a critical understanding of the risks posed by environmental pollutants on human health and identify knowledge gaps.

POPH 107 Sleep and Physical Activity in Population Health 3 Credits

This course explores how physical activity (PA) and sleep impact population health. Students will evaluate the scientific literature on the role of PA and sleep in preventing chronic diseases, promoting mental health, and enhancing overall well-being. Through experiential research, students will also learn how to measure PA and sleep information. The course will examine how environmental, social, cultural, and policy-related factors influence PA and sleep behaviors in diverse populations.

Prerequisites: CGH 001

POPH 120 (BSTA 120, CGH 120, EPI 120) Independent Study or Research in Population Health 1-4 Credits

This course can be directed readings or research in Population Health or an experiential learning experience that puts students' understanding of Population Health into practice. Department permission required.

Repeat Status: Course may be repeated.

POPH 126 Population Health and the Media 3 Credits

This course explores the importance of the relationship that health organizations have with the media and the powerful role it can play in what a population deems important in public health. We will examine how mass media campaigns have been used to change behaviors: tobacco, alcohol and drug use; lowering risk factors for heart disease and diabetes; and even road safety to produce life-saving changes in large populations as well as to manage national and worldwide health crises.

POPH 130 Internship in Population Health 1-4 Credits

In this introductory course, students will engage in supervised work in Population Health. Potential internship sites include government agencies, non profit organizations and the private sector. A written report is required and preceptor evaluation will be required. Department permission required.

Repeat Status: Course may be repeated.

POPH 150 Special Topics in Population Health 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an intermediate level.

Repeat Status: Course may be repeated.

POPH 160 Population Health Study Abroad 1-3 Credits

Population health focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

POPH 195 1-4 Credits

Repeat Status: Course may be repeated.

POPH 300 Apprentice Teaching 1-4 Credits

Repeat Status: Course may be repeated.

POPH 301 Population Health Capstone (Proposal) 1-3 Credits

In this writing intensive course, students will work closely with their academic advisor and site preceptor to develop a detailed proposal for a Population Health project. Department permission required. Students must complete 3 credits of Capstone Proposal.

Repeat Status: Course may be repeated.

Attribute/Distribution: WRIT

POPH 302 Population Health Capstone (Execution) 1-3 Credits

In this course, students will implement and evaluate the Population Health project proposed in POPH 301. A final capstone report, oral presentation, and preceptor evaluation will be required. Department permission required. Students must complete 3 credits of Capstone Execution.

Repeat Status: Course may be repeated.

Prerequisites: POPH 301

POPH 305 Honors Population Health Capstone (Proposal) 1-4 Credits

In this writing intensive course, students will work closely with their academic advisor and site preceptor to develop a detailed proposal for a Population Health project. This course includes a weekly honors seminar. To qualify for honors, students must have a 3.5 major GPA and department permission. A total of 4 credits is required to complete the Capstone Proposal.

Repeat Status: Course may be repeated.

POPH 306 Honors Population Health Capstone (Execution) 1-4 Credits

In this course, students will implement and evaluate the Population Health project proposed in POPH 305. A final capstone report, oral presentation, and preceptor evaluation will be required. This course includes a weekly honors seminar. To qualify for honors, students must have a 3.5 major GPA and department permission. A total of 4 credits is required to complete the Capstone Execution.

Repeat Status: Course may be repeated.

Prerequisites: POPH 305

Can be taken Concurrently: POPH 305

POPH 317 Urban Greenspace and Health 3 Credits

This class will investigate the myriad and complex ways in which urban greenspaces impact the health of human populations. This course will present biological/psychosocial theories and mechanisms as well as topical and methodological issues underlying relationships between greenspace and health. The class will also analyze contemporary urban greening interventions. Students will complete experiential learning activities to collect and analyze data describing health effects of urban greenspaces. Additional topics include chronic diseases, mental health, stress, climate change adaptation, urban heat islands.

Prerequisites: EPI 104

POPH 318 Advanced Technologies for Health 3 Credits

This course introduces different technologies related to healthcare, health education, and health promotion. We will explore how the technologies, including computer simulations, serious games, immersive environments (VR/AR), virtual agents, dashboards, eye tracking, emotion detection, and wearable sensors, can be used for health education and promotion. We also discuss the theoretical models and theories guiding the design/use of those technologies.

Prerequisites: POPH 001 or CGH 001

POPH 319 Population Health Bioethics 3 Credits

This course will focus on macro-level bioethical dilemmas that arise outside the clinic, at the level of the population, the state, the country, or the globe. Population health policies raise questions about autonomy, individual rights, coercion, justice, community, the meaning of the common good, norms of research, and multi-cultural values. The course will explore a range of questions, including: how to conceptualize, measure and evaluate health inequalities?; how should we set spending priorities?; is paternalism acceptable?

Prerequisites: POPH 001 or CGH 001

POPH 320 (BSTA 320, CGH 320, EPI 320) Independent Study or Research in Population Health 1-4 Credits

This course can be directed readings or research in Population Health or experiential learning that puts the student's understanding of Population Health into practice. Department permission required.

Repeat Status: Course may be repeated.

POPH 330 Internship in Population Health 1-4 Credits

In this advanced course, students will engage in supervised work in Population Health. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required and preceptor evaluation will be required. Department permission required.

Repeat Status: Course may be repeated.

POPH 350 Special Topics in Population Health 3-4 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

POPH 360 Population Health Study Abroad 1-3 Credits

Upper-level population health focused course taken during an abroad experience.

Repeat Status: Course may be repeated.

POPH 401 Population Health Concepts and Methods 3 Credits

In this introductory graduate course, students will apply foundational concepts related to the definition and measurement of health and disease as well as the multiple determinants of population health (from cell to society). Students will then apply the fundamental principles of quantitative and qualitative research methodologies in order to integrate the multiple determinants of health in population health research and practice. This course will also explore the translation of research findings to programmatic intervention and policy development.

POPH 403 Biological Basis of Population Health: Concepts and Methods 3 Credits

In this graduate course, students will investigate the biological mechanisms underlying population health outcomes as well as the roles of individual and group susceptibility to disease. Students will also explore and apply the emerging and traditional tools used in genomic, molecular, immunological, and environmental fields. Students will then integrate the biological and societal determinants of health in order to propose programmatic and policy interventions that promote health and prevent disease.

POPH 405 Qualitative Research Methods 3 Credits

This is a graduate-level course designed to teach the basics of rigorous qualitative methodology. It is a practical course through which you will learn about and gain experience in study design and sampling methods; data collection through participation and observation, interviews, and focus groups; different traditions of data analysis; and presenting qualitative methods in academic writing, including for study design or grant writing and academic journal writing.

POPH 406 Seminar: Cultural Understanding and Health 1 Credit

Cultural understanding and cultural relativism provide perspectives, abilities, and skills needed to work with diverse peoples and communities in cross-cultural settings. This course will explore cultural understanding and cultural relativism as well as other perspectives, methods, and skills required to understand, participate in, and implement culturally-appropriate and culturally-relevant health-related projects at the individual and community-levels.

POPH 407 Seminar: Data-informed Policy Making 1 Credit

This seminar will introduce students to the different ways in which data informs the policy decision-making process. We will begin with an analysis of the different types of data and how they influence policy prioritization processes. This will be followed by a discussion about how governments and non-governmental organizations strategically use data to evaluate policy effectiveness and search for improvements.

POPH 408 Population Health Survey Methods 3 Credits

In this graduate course, students will explore and apply the foundational concepts and methods related to questionnaire design, sampling, quantitative and qualitative data collection, and data preparation for analysis. Specifically, this course will expose students to the foundational concepts and skills related to measure development and validation. This course will also introduce students to mixed methods research.

Prerequisites: POPH 401 and (EPI 404 or EPI 304) and BSTA 402

POPH 409 Social Determinants of Health 3 Credits

This course will look at cultural and social institutions, as well as other components of culture, society, and social structure, that affect health and the health outcomes at the individual and community-levels. Topics to be analyzed include cultural traditions, social norms, politics, economics, housing, transportation, and subsistence strategies, just to name a few. Additionally, specific illnesses, sicknesses, and diseases linked to cultural and social institutions and the human experience will also be explored.

Prerequisites: POPH 401

POPH 410 Population Health Capstone/Thesis Project 3 Credits

In this writing-intensive course, students will work closely with their academic advisor to develop a detailed research proposal for a population health thesis project.

Prerequisites: POPH 401

POPH 411 Population Health Thesis II (execution) 3 Credits

In this course, students will work closely with their academic advisor and other relevant mentors to implement and evaluate the population health thesis project proposed in "Population Health Thesis I". A final thesis paper and oral presentation will be required.

Prerequisites: POPH 410

POPH 413 Foundations of Global Health 3 Credits

This graduate-level course provides an in-depth examination of the issue of global health. We begin with an analysis of the rise of the international community in addressing population health needs, and the international norms guiding healthcare delivery systems. We will also focus on healthcare delivery systems, technological and scientific innovations, and data science in response to healthcare needs in several developing nations. Finally, students will understand the political, social, and commercial determinants of population health in these countries.

POPH 414 Global Health Research or Field Experience 3 Credits

During this field experience, students will engage in supervised work in global health. Placements will be arranged to suit individual interests and career goals. Potential placements include government agencies, non-profit organizations, the private sector, and other academic institutions that are involved with global health work. A written report and preceptor evaluation will be required.

Repeat Status: Course may be repeated.

POPH 418 Advanced Technologies for Health 3 Credits

This course introduces different technologies related to healthcare, health education, and health promotion. We will explore how the technologies, including computer simulations, serious games, immersive environments (VR/AR), virtual agents, dashboards, eye tracking, emotion detection, and wearable sensors, can be used for health education and promotion. We also discuss the theoretical models and theories guiding the design/use of those technologies.

POPH 419 Population Health Bioethics 3 Credits

This course will focus on macro-level bioethical dilemmas that arise outside the clinic, at the level of the population, the state, the country, or the globe. Population health policies raise questions about autonomy, individual rights, coercion, justice, community, the meaning of the common good, norms of research, and multi-cultural values. The course will explore a range of questions, including: how to conceptualize, measure and evaluate health inequalities?; how should we set spending priorities?; is paternalism acceptable?

POPH 420 (BSTA 420, CGH 420, PUBH 420) Independent Study or Research in Population Health 1-4 Credits

This course can be directed readings or research in Population Health or experiential learning that puts the student's understanding of Population Health into practice. Department permission required.

Repeat Status: Course may be repeated.

POPH 430 Internship in Population Health 1-4 Credits

In this advanced course, graduate students will engage in supervised work in Population Health. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required and a preceptor evaluation will be required. Department permission required.

Repeat Status: Course may be repeated.

POPH 431 Environmental Health Justice 3 Credits

This course introduces key concepts and methods, such as exposure science, epidemiology, toxicology, biomarkers/omics, risk assessment, implementation science, and policy, in order to deepen the understanding of the relationship between major emerging environmental issues and human health. Specifically, the students will apply key tools to explain the relationship between global-, regional, and local-scale environmental contributors to human health outcomes.

POPH 450 Special Topics in Population Health 3 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.

POPH 480 Seminar: Population Health Doctoral Roundtable 1 Credit

In this seminar, students will present their progress and receive peer mentoring on various stages of the research process (e.g. conference presentations, grant applications, manuscripts, dissertation proposal). This seminar will also provide career counseling resources, such as presentations on grant opportunities, the job search process, career networking, interview process, etc. All students will be required to enroll in this seminar until they advance to candidacy and present their dissertation proposal prior to the formal proposal defense with the doctoral committee.

Repeat Status: Course may be repeated.

POPH 481 Seminar: Supervised Research in Population Health 1 Credit

In this seminar, students will work closely with their doctoral advisor or another faculty mentor on supervised research projects. Students will be required to enroll in this seminar in their second semester of the doctoral program and continue to take this course every semester until they advance to the qualifying exam stage.

Repeat Status: Course may be repeated.

Public Health Courses

PUBH 401 Health Promotion and Education 3 Credits

In this course, students will gain a deeper insight into the key conceptual frameworks used in health behavior change, promotion, and education. Students will apply these concepts to specific health behaviors, including tobacco use, alcohol use, substance use, obesity and eating behaviors, physical activity, unintentional injury, workplace injury, violence, and risky sexual behaviors. Students will also explore cross-cutting topics such as behavioral economics, patient and consumer activation, patient communication, cultural competence, risk assessment, chronic conditions and depressive disorders.

PUBH 402 Health Services, Administration, Politics, and Policy 3 Credits

This course will provide students with an overview of how the U.S. healthcare system works. Students will learn the federal, state, and local administration of healthcare services, as well as the implementation process. We will also address the various phases of the health policy-making process, across several sectors. A comparative analysis of the differences between public versus private healthcare service provision will also be provided. We will conclude with comparisons between the US and other countries.

PUBH 403 Health Program Planning and Implementation 3 Credits

Program planning and implementation are essential skills for a public health professional. In this class, students will learn to perform various functions associated with program planning and implementation such as: assess and prioritize community needs; identify evidence-based best practices for choosing interventions; develop and practice writing SMART objectives and logic models; understand how to engage and communicate with stakeholders and community members; as well as how to organize a project budget, staffing plan and timeline.

Prerequisites: PUBH 401 and (EPI 404 or EPI 304)

PUBH 404 Seminar: Leadership and Health Practice 1 Credit

This seminar will introduce students to foundational leadership models and theories that can be applied in a wide range of population and public health practice settings. Students will also learn key leadership skills, including effective interpersonal communication, collaborative decision-making, negotiation, mediation, and team empowerment.

Prerequisites: PUBH 401

PUBH 405 Program Evaluation Methods 3 Credits

Evaluation is an essential public health function and is critically important in the development and maintenance of evidenced-based practice. This interactive, practical course introduces concepts, methodology, and skills used to evaluate health promotion programs. Students will learn how to develop evaluation plans, including process, impact and outcome evaluations. This class will focus on the knowledge and acquisition of skills through assessment, critical analysis, and critique of program evaluations conducted in a range of community health and public health settings.

Prerequisites: PUBH 403

PUBH 410 Applied Practice Experience 3 Credits

Students complete an applied practice experience (APE or "practicum") in a supervised setting consistent with their career goals. With guidance from their site preceptor, students create at least two work products or "deliverables" during their practicum. A final report and oral presentation are also required, and site preceptors evaluate the student's performance.

Prerequisites: PUBH 401

PUBH 411 Public Health Capstone 3 Credits

In consultation with a COH faculty member, students complete a public health capstone project (a.k.a., integrative learning experience (ILE)) that demonstrates synthesis of MPH foundational and concentration competencies. Students produce a high-quality written product (e.g., program evaluation report, training manual, policy statement, legislative testimony with accompanying supporting research, etc.) useful to external stakeholders.

Prerequisites: PUBH 410

PUBH 420 (BSTA 420, CGH 420, POPH 420) Independent Study or Research in Public Health 1-3 Credits

This course can be directed readings or research in Public Health or experiential learning that puts the student's understanding of Public Health into practice. Department permission required.

Repeat Status: Course may be repeated.

PUBH 430 Internship in Public Health 1-3 Credits

In this advanced course, graduate students will engage in supervised work in Public Health. Potential internship sites include government agencies, non-profit organizations, and the private sector. A written report is required and a preceptor evaluation will be required.

Department permission required.

Repeat Status: Course may be repeated.

PUBH 450 Special Topics in Public Health 3 Credits

In this course, students will engage in an intensive exploration of a topic of special interest that is not covered in other courses. Topics addressed will be at an advanced level.

Repeat Status: Course may be repeated.