

# Community and Population Health

## DEPARTMENT CHAIR:

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## UNDERGRADUATE MAJORS

### POPULATION HEALTH

Lehigh University's 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 124 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.

### 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.docuform.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)

Global Health

Community Health

Population Health

Maternal & Child Health

Indigenous Peoples Health

### GRADUATE PROGRAMS

PHD Population Health

Master of Public Health (MPH)

Master of Population Health (MS)

4+1 Accelerated Master of Public Health (MPH)

4+1 Accelerated Master of Population Health (MS)

Graduate Certificate in Population Health

Graduate Certificate Global Population Health

MBA/MPH (with the College of Business)

Flex MBA with Healthcare Management Concentration (with the College of Business)

4+1 Master of Engineering in Healthcare Systems Engineering (with the P.C. Rossin College of Engineering and Applied Science)

## MAJOR PROGRAMS

### 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 degree requires a minimum of 124 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 Health	4
POPH 002	Population Health Research Methods & Application	4
POPH 104	Careers in Population Health	3
EPI 304	Methods in Epidemiology I	4
EPI 305	Methods in Epidemiology II	4

#### Data Science Requirement <sup>1</sup>

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.		6-8

#### Determinants of Health (choose 2) 8

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

#### 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. <sup>2</sup>

#### Total Credits 62-71

<sup>1</sup>

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.

### 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.

#### College Distribution Requirements

ENGL 001	Critical Reading and Composition
ENGL 002	Research and Argument <sup>1</sup>
Social Science Requirement (2 courses designated in the course catalog as SS)	
Humanities Requirement (2 courses designated in the course catalog as HU)	

#### Core courses 18

CGH 001	Community Health
CGH 004	Introduction to Global Health
CGH 103	Biological & Environmental Determinants of Health
CGH 101	Careers in Community and Global Health Studies
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	Population Health Data Science I
BSTA 101	Population Health Data Science II
BSTA 305	Population Health Data Science III
BSTA 402	Health Data and Computational Science <sup>2</sup>
BSTA 403	Applications in Statistical Learning <sup>2</sup>
BSTA 404	Data Architecture, Mining, and Linkage <sup>2</sup>
EPI 304	Methods in Epidemiology I
EPI 305	Methods in Epidemiology II
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 016	Seminar: Cultural Understanding and Health
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CGH 021	Culture and Health
CGH 022	Global Perspectives on Health
CGH 122	Indigenous Healing Traditions
CGH 322	Contemporary Indigenous Health
ANTH 155	Medical Anthropology
POPH 003	Justice, Equity, and Ethics in Population Health

#### Concentration Electives 15-20

Concentration electives are chosen in consultation with the advisor and must have an applied focus. <sup>3</sup>

#### Collateral Requirement

Foreign Language <sup>4</sup>

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

<sup>1</sup> All students in the College of Health are required to take ENGL 002 Research and Argument special section for College of Health students. Advanced Placement is not accepted for ENGL 002 Research and Argument

<sup>2</sup> Graduate courses require special approval.

<sup>3</sup> 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.

<sup>4</sup> Language courses may fulfill HU requirements.

#### Plan of Study

The proposed plan of study grid allows flexibility for students who desire to pursue additional major or minor programs within the College of Health or in one of Lehigh's other undergraduate colleges.

Students interested in pursuing additional degree programs should consult with their advisor. Students studying within the College of Health are encouraged to engage in international experiential learning through study abroad, internship or research experiences.

First Year			
Fall	Credits	Spring	Credits
CGH 001 or 004	3	CGH 001 or 004	3
ENGL 001	3	ENGL 002	3
Language Course (HU requirement)	4	Language Course (HU requirement)	4
Elective (SS requirement)	3-4	Elective (SS requirement)	3-4
<b>13-14</b>			<b>13-14</b>

Second Year			
Fall	Credits	Spring	Credits
CGH 103	4	CGH 105	4
CGH 104	4	CGH 101	3
Cross-Cultural or Diversity Requirement	3-4	Methods Requirement	3-4
Elective	3-4	Elective	3-4
<b>14-16</b>			<b>13-15</b>

Third Year			
Fall	Credits	Spring	Credits
Methods Requirement	3-4	Methods Requirement	3-4

Cross-Cultural or Diversity Requirement	3-4	Cross-Cultural or Diversity Requirement	3-4
Concentration Elective	3-4	Concentration Elective	3-4
Elective	3-4	Elective	3-4
<b>12-16</b>		<b>12-16</b>	

## Fourth Year

Fall	Credits	Spring	Credits
CGH 301 or 303	3	CGH 302 or 304	3
Concentration Elective	3-4	Concentration Elective	3-4
Elective	3-4	Elective	3-4
Elective	3-4	Elective	3-4
<b>12-15</b>		<b>12-15</b>	

**Total Credits: 101-121****Plan of Study (Pre-Health)**

Many students who pursue a BA in Community and Global Population Health plan to continue graduate-level work in a health-related discipline. Pre-health students at Lehigh have the opportunity to major in any area, provided they also complete the prerequisite coursework set forth by the medical, dental, or other professional program in which they are interested. Students interested in attending medical school or other health-related school should contact The Center for Career & Professional Development (<https://careercenter.lehigh.edu/>) ([careercenter@lehigh.edu](mailto:careercenter@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 advisor.

## First Year

Fall	Credits	Spring	Credits
ENGL 001	3	ENGL 002	3
MATH 051	4	MATH 052	3
CHM 030 or 040	4	CHM 031 or 041	4
PSYC 001 <sup>1</sup>	4	BIOS 041 & BIOS 042	4
		Cross-Cultural or Diversity Requirement <sup>2</sup>	3
<b>15</b>		<b>17</b>	

## Second Year

Fall	Credits	Spring	Credits
CGH 001 or 004	3	CGH 001 or 004	3
CHM 110 & CHM 111	4	CGH 101	3
BIOS 115 & BIOS 116	4	BSTA 001 & BSTA 002 <sup>3</sup>	4
PHY 010 & PHY 012	5	CHM 112 & CHM 113	4
		PHY 013 & PHY 022	4
<b>16</b>		<b>18</b>	

## Third Year

Fall	Credits	Spring	Credits
CGH 103	4	CGH 105	4
CGH 104	4	Methods Requirement	3-4
BIOS 121	3	Concentration Elective	3-4
BIOS 371	3	Language Course (HU requirement)	4
Methods Requirement	3-4		
<b>17-18</b>		<b>14-16</b>	

## Fourth Year

Fall	Credits	Spring	Credits
CGH 301 or 303	3	CGH 302 or 304	3

Concentration Elective	3-4	Concentration Elective	3-4
Cross-Cultural or Diversity Requirement	3-4	Concentration Elective	3-4
Language Course (HU requirement)	4	Cross-Cultural or Diversity Requirement	3-4
<b>13-15</b>		<b>12-15</b>	

**Total Credits: 122-130**

- 1 Fulfills the college SS requirement.
- 2 Some courses that meet this Cross-Cultural or Diversity requirement will also fulfill the college SS requirement. Consult with your advisor.
- 3 BSTA 001 Population Health Data Science I & BSTA 002 Population Health Data Science I Algorithms Lab qualify as department-specific statistics courses for MCAT.

**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](mailto:careercenter@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 advisor.

## First Year

Fall	CR	Spring	CR
ENGL 001		ENGL 002	3
MATH 051		MATH 052	3
CHM 030		CHM 031 or 041	4
First-year seminar	3-4	BIOS 041 & BIOS 042	4
<b>14-15</b>		<b>14</b>	

## Second Year

Fall	CR	Spring	CR
(1) Course to fulfill major requirements <sup>1</sup>	3-4	(1) Course to fulfill major requirements <sup>1</sup>	3-4
BIOS 044	3	BSTA 001 & BSTA 002 <sup>2</sup>	4
CHM 110 & CHM 111	4	CHM 112 & CHM 113	4
PHY 010 & PHY 012	5	PHY 013 & PHY 022	4
<b>15-16</b>		<b>15-16</b>	

## Third Year

Fall	CR	Spring	CR
(2) Courses to fulfill major requirements <sup>1</sup>	6-8	(3) Courses to fulfill major requirements <sup>1</sup>	9-12
PSYC 001	4	CGH 101 or POPH 104	3
BIOS 115	3	BIOS 372	3
BIOS 371	3		
<b>16-18</b>		<b>15-18</b>	

## Fourth Year

Fall	CR	Spring	CR
(3) Courses to fulfill major requirements <sup>1</sup>	9-12	(3) Courses to fulfill major requirements <sup>1</sup>	9-12
Major capstone or field/practicum experience	3-4	Major capstone or field/practicum experience	3-4
<b>12-16</b>		<b>12-16</b>	

**Total Credits: 113-129**

1

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 towards their major requirements.

2

BSTA 001 Population Health Data Science I/BSTA 002 Population Health Data Science I Algorithms Lab fulfills MCAT statistics requirement.

### MINOR PROGRAMS

Minor programs in the College of Health are open to students from across the university. For more information or to declare a minor, contact the College of Health at [cohadvicing@lehigh.edu](mailto:cohadvicing@lehigh.edu). To declare any minor offered by the College of Health, complete this form (<https://powerforms.docuform.net/329016c8-371a-40cf-9ed9-f08c3197cc71/?env=na3&acct=4522e8bc-42ec-46ec-af83-a167d8a26e3f&accountId=4522e8bc-42ec-46ec-af83-a167d8a26e3f&recipientLang=en>).

### 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 Health	4
BSTA 001 & BSTA 002	Population Health Data Science I and Population Health Data Science I Algorithms Lab	4
EPI 304	Methods in Epidemiology I	4
Elective chosen in consultation with the adviser		3-4
<b>Total Credits</b>		<b>15-16</b>

### GLOBAL HEALTH

The minor 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 global health minor will have a strong interest in examining the ways health disparities and specific risk factors affect local and global populations. The minor 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.

CGH 004	Introduction to Global Health	3
POPH 106	Global Environment and Human Welfare	3
Field or Research Experience <sup>1</sup>		3-4
Two electives in consultation with adviser. One elective must be at the 300-level.		6-8
<b>Total Credits</b>		<b>15-18</b>

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. The student will develop the minor focus and progression in consultation with the Indigenous peoples health minor adviser.

#### 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	
<b>Total Credits</b>		<b>15-16</b>

### 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 Health	3-4
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
<b>Total Credits</b>		<b>15-18</b>

### COMMUNITY HEALTH

The minor in community and global 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.

CGH 004	Introduction to Global Health	3
POPH 106	Global Environment and Human Welfare	3
Field or Research Experience <sup>1</sup>		3-4
Two electives in consultation with adviser. One elective must be at the 300-level.		6-8
<b>Total Credits</b>		<b>15-18</b>



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, CINC 387 Creative Inquiry Projects, CINC 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
<b>Determinant Class (choose one)</b>		<b>3-4</b>
CGH 104	Sociocultural & Political Determinants of Health	
CGH 105	Commercial Determinants of Health	
Field or Research Experience <sup>1</sup>		3-4
Two electives in consultation with adviser. One elective must be at the 300-level.		6-8
<b>Total Credits</b>		<b>18-22</b>

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, CINC 387 Creative Inquiry Projects, CINC 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.

### 4+1 ACCELERATED PROGRAMS

Qualified students have the opportunity to earn an MS in Population Health 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 enrolled in one of the College of Health's majors or majoring in Health, Medicine and Society who earn a minimum overall GPA of 3.5 may elect to be enrolled in 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 must apply for acceptance.

Benefits of the 4+1 program include

- 20% tuition discount on graduate tuition
- no application process for students with an overall GPA of 3.5 or better
- complete up to 4 graduate courses while an undergraduate student
- fulfill the MS or MPH degree requirements in 1/2 the time

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](mailto:cohadvising@lehigh.edu).

### 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

POPH 401	Population Health Concepts and Methods
POPH 403	Biological Basis of Population Health: Concepts and Methods
POPH 405	Qualitative Research Methods
POPH 408	Population Health Survey Methods
POPH 409	Social Determinants of Population Health
BSTA 402	Health Data and Computational Science
BSTA 403	Applications in Statistical Learning
BSTA 404	Data Architecture, Mining, and Linkage
EPI 404	Methods in Epidemiology I <sup>1</sup>

#### Seminars 11

Students are required to complete a minimum of four 1-credit seminars. The doctoral roundtable seminar is taken every semester until the student advances to candidacy. The supervised research seminar is taken every semester, beginning in the second semester, until the student advances to the qualifying stage.

POPH 407	Seminar: Data-informed Policy Making
POPH 412	Seminar: Research Ethics in Population Health
POPH 480	Seminar: Population Health Doctoral Roundtable (minimum of 6 semesters)
POPH 481	Seminar: Supervised Research in Population Health (minimum 3 semesters)

#### Concentration electives

Six graduate-level courses, a minimum of 18 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 concentration areas of interest. These courses must be taken in the College of Health. 18

### Population Health Dissertation Proposal <sup>2</sup>

POPH 482 Population Health Dissertation Proposal 2-8

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 <sup>3</sup>

POPH 499 Population Health Dissertation 1-10

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

1

If EPI 304 /EPI 404 Methods in Epidemiology I was completed at the undergraduate level at the College of Health, the student will be expected to take EPI 450 Special Topics in Epidemiology instead.

2

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. As students are required to take the 1-credit POPH 480 Seminar: Population Health Doctoral Roundtable until they advance to candidacy, the POPH 482 Population Health Dissertation Proposal course may range from 2 to 8 credits (i.e., to reach the required 9 credits for full-time enrollment if the student has not yet completed 72 graduate credits).

3

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 prepares graduate 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 Requirements

PUBH 401	Health Promotion and Education	3
PUBH 402	Health Services, Administration, Politics, and Policy	3
PUBH 403	Health Program Planning, Implementation, and Evaluation	3
PUBH 410	Public Health Internship and Capstone I (proposal)	3
PUBH 411	Public Health Internship and Capstone II (execution)	6

BSTA 402	Health Data and Computational Science	3
BSTA 404	Data Architecture, Mining, and Linkage	3
EPI 404/304	Methods in Epidemiology I <sup>1</sup>	3
POPH 405	Qualitative Research Methods	3
POPH 431	Environmental Health Sciences: Concepts and Methods	3

#### Seminars

PUBH 404	Seminar: Leadership and Health Practice	1
POPH 406	Seminar: Cultural Understanding and Health	1
POPH 407	Seminar: Data-informed Policy Making	1

#### Concentration Electives

Two graduate-level courses, a minimum of 6 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. These courses can be taken outside the College of Health, but advisor approval is required. <sup>2</sup> 6

**Total Credits** 42

1

If EPI 304/EPI 404 Methods in Epidemiology I was completed at the undergraduate level at the College of Health, the student is expected to take EPI 450 Special Topics in Epidemiology instead.

2

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

### MASTER OF POPULATION HEALTH (MS)

Lehigh University's Master of Science (MS) in Population Health 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 42 credits.

#### Core Requirements

POPH 401	Population Health Concepts and Methods (Core Requirements)	3
POPH 403	Biological Basis of Population Health: Concepts and Methods	3
POPH 405	Qualitative Research Methods	3
POPH 408	Population Health Survey Methods	3
POPH 409	Social Determinants of Population Health	3
POPH 410	Population Health Thesis I (proposal)	1
POPH 411	Population Health Thesis II (execution)	3
EPI 404	Methods in Epidemiology I <sup>1</sup>	3
BSTA 402	Health Data and Computational Science	3
BSTA 403	Applications in Statistical Learning	3
BSTA 404	Data Architecture, Mining, and Linkage	3

#### Seminars

Students are required to complete a minimum of two 1-credit special topics seminars.

POPH 412	Seminar: Research Ethics in Population Health	1
POPH 407	Seminar: Data-informed Policy Making	1

### Concentration Electives

Three graduate-level courses, a minimum of 9 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 concentration areas of interest. These courses must be taken in the College of Health.<sup>2</sup>

<b>Total Credits</b>	<b>42</b>
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1

If EPI 304 / EPI 404 Methods in Epidemiology I was completed at the undergraduate level at the College of Health, the student will be expected to take EPI 450 Special Topics in Epidemiology instead.

2

For students enrolled in the 4+1 accelerated BS/MS program or the 4+1 accelerated BA/MS program, two of these elective courses must be taken during the student's undergraduate degree and cannot be applied as an undergraduate degree requirement.

### 4+1 ACCELERATED PROGRAMS

Qualified students have the opportunity to earn an MS in Population Health 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 enrolled in one of the College of Health's majors or majoring in Health, Medicine and Society who earn a minimum overall GPA of 3.5 may elect to be enrolled in 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 must apply for acceptance.

Benefits of the 4+1 program include

- 20% tuition discount on graduate tuition
- no application process for students with an overall GPA of 3.5 or better
- complete up to 4 graduate courses while an undergraduate student
- fulfill the MS or MPH degree requirements in 1/2 the time

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](mailto:cohadvising@lehigh.edu).

### 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.

POPH 401	Population Health Concepts and Methods	3
EPI 404	Methods in Epidemiology I	3
BSTA 402	Health Data and Computational Science	3
Elective chosen in consultation with the advisor.		3-4

<b>Total Credits</b>	<b>12-13</b>
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#### GLOBAL POPULATION HEALTH CERTIFICATE

The graduate certificate in Global Population Health will prepare 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 Population 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 Population 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.

POPH 401	Population Health Concepts and Methods	3
POPH 413	Foundations of Global Population Health	3
POPH 414	Global Population Health Field Experience	3
Elective chosen in consultation with the advisor.		3
<b>Total Credits</b>	<b>12</b>	

### 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 capture two complimentary degrees within a one-and-a-half-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. May be taken in conjunction with BSTA 002.



**BSTA 002 Population Health Data Science I Algorithms Lab 1 Credit**

Students will apply statistical concepts learned in BSTA 001 Population Health Data Science I to describe, visualize, and draw inferences on a variety of health datasets using Python3. Datasets that students will study include: influenza-like illness and confirmed positive cases of COVID-19 tracked by the Centers for Disease Control and Prevention, and a repository of potentially hazardous chemicals found in commercial products. Lab is to be taken concurrently with lecture (BSTA 001 Population Health Data Science I).

**Corequisites:** BSTA 001

**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 101 Population Health Data Science II 3 Credits**

Students will expand their statistics and machine learning toolkit by learning how to compare univariate distributions, build traditional regression models for continuous and binary data, explore supervised learning methods such as: Tree-based learning, KNN/Collaborative filtering, and Feed forward Neural networks, and understand how to manipulate, ask, and answer questions from big datasets. Students will be expected to propose a population health project mid-semester, and apply and present techniques they learned in class. May be taken in conjunction with BSTA 103.

**Prerequisites:** BSTA 001

**BSTA 103 Population Health Data Science II Algorithms Lab 1 Credit**

Students will apply regression and machine learning models learned in BSTA101 Population Health Data Science II to health datasets using Python3. Datasets that students will study include: the National Health and Nutrition Examination Survey, influenza-like illness and confirmed positive cases of COVID-19 tracked by the Centers for Disease Control and Prevention, and the National Health Interview Survey. Lab is to be taken concurrently with lecture (BSTA101 Population Health Data Science II).

**Prerequisites:** BSTA 001

**Corequisites:** BSTA 101

**BSTA 120 (CGH 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 300 Apprentice Teaching 1-4 Credits**

**Repeat Status:** Course may be repeated.

**BSTA 305 Population Health Data Science III 3 Credits**

In this course, students are introduced to Bayesian statistics and computational techniques, ensemble learning (boosting, bagging, stacking), how to handle missing data, and how to build reproducible analysis pipelines via Makefiles. The statistical and machine learning techniques taught will be applied to a variety of real population health datasets; students will apply these techniques and submit a research-style manuscript. Students will investigate a current problem in population health and provide a data-driven solution.

**Prerequisites:** BSTA 101 or BSTA 103

**Corequisites:** BSTA 306

**BSTA 306 Population Health Data Science III Algorithms Lab 1 Credit**

Required programming lab course for students enrolled in BSTA 305 Population Health Data Science III.

**Prerequisites:** BSTA 101 or BSTA 103

**Corequisites:** BSTA 305

**BSTA 307 Applied Machine Learning for Health Sciences 3 Credits**

Machine learning uses interdisciplinary techniques to create automated systems that can sift through large amounts of data at high speed to make predictions and decisions with minimal human intervention. Machine learning is increasingly pervasive and impactful in public health and precision medicine. This class will provide students with a broad cross-section of practical machine learning skills while giving them an appreciation of how machine learning is being applied in the context of public health research today.

**Prerequisites:** BSTA 101

**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 320 (CGH 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 396 1-4 Credits**

**Repeat Status:** Course may be repeated.

**BSTA 402 Health Data and Computational Science 3 Credits**

Students will learn the fundamentals of probability theory, univariate statistics, statistical computing/programming/visualization, supervised and machine learning. We will focus on theoretical concepts and on writing code in Python to apply what we learn in class to real-life population health examples such as: health policy, infectious disease, clinical trials, and data collected from national databases. A mix of traditional and experiential learning applied to real-life population health data will equip students with statistical tools to answer pressing population health problems.

**BSTA 403 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.

**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 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 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 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 120 (BSTA 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 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 illustrates from the United States and around the world.

**CGH 320 (BSTA 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. In addition to examining policies that are designed to address the health care needs of an aging population, we will compare and evaluate policies that address the social and.

**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 497 1-3 Credits**

**Repeat Status:** Course may be repeated.

**Epidemiology Courses****EPI 304 Methods in Epidemiology I 0,4 Credits**

Epidemiology is the field of scientific inquiry concerned with questions about the determinants of disease in the population. This course covers fundamental concepts of epidemiological thinking including study design and analytical methods to address confounding, bias, and effect modification. Students will be introduced to measures of disease frequency and association, sources of bias and how to address them, and concepts in causal inference. Case studies will address health concerns from infectious disease outbreaks to population health surveillance and disease prevention.

**EPI 305 Methods in Epidemiology II 0,4 Credits**

To investigate complicated questions in epidemiology, this second course offers a deeper, expanded view of concepts and methods for observational epidemiological studies. Topics include detailed coverage of clinical trials, cohort studies, case-control study variants and analytical methods. Includes the use of multivariable models to adjust for confounding effects and to estimate interaction effects, and applications of machine learning. Deeper concepts in causal inference are examined through the use of directed acyclic graphs.

**Prerequisites:** EPI 304 and BSTA 101

**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.

**EPI 404 Methods in Epidemiology I 3 Credits**

Epidemiology is the field of scientific inquiry concerned with questions about the determinants of disease in the population. This course covers fundamental concepts of epidemiological thinking including study design and analytical methods to address confounding, bias, and effect modification. Students will be introduced to measures of disease frequency and association, sources of bias and how to address them, and concepts in causal inference. Case studies will address health concerns from infectious disease outbreaks to population health surveillance and disease prevention.

**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 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 with 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 120 (BSTA 120, CGH 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 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.

**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 320 (BSTA 320, CGH 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 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 Population 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 Thesis I (proposal) 1 Credit**

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 412 Seminar: Research Ethics in Population Health 1 Credit**

In this graduate seminar, students will explore ethical concepts and critical issues pertaining to the ethical inclusion of human subjects in population health research as well as the responsible conduct of research. This course will provide opportunities for writing about, discussion of, and case-based learning around current and historical perspectives on population health research. Students will complete the necessary training for participating in human subjects research as well as the responsible conduct of research at Lehigh University.

**POPH 413 Foundations of Global Population Health 3 Credits**

This graduate-level course provides an in-depth examination of the issue of 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, 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 Population Health Field Experience 3 Credits**

During this field experience, students will engage in supervised work in global population 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 population health work. A written report and preceptor evaluation will be required.

**Repeat Status:** Course may be repeated.

**POPH 431 Environmental Health Sciences: Concepts and Methods 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 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.

**POPH 482 Population Health Dissertation Proposal 1-8 Credits**

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.

**Repeat Status:** Course may be repeated.

**POPH 499 Population Health Dissertation 1-10 Credits**

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.

**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, Implementation, and Evaluation 3 Credits**

In this course, students will gain a deeper understanding of the foundational principles, conceptual frameworks, and research methodology used in health program planning, implementation and evaluation. Students will also explore quantitative and qualitative data collection and analysis, budgets and grant writing. During the course, it is hoped that students will appreciate and apply the interdisciplinary, collaborative model used in Population Health.

**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 410 Public Health Internship and Capstone I (proposal) 3 Credits**

In this writing-intensive course, students will work closely with their academic advisor and internship site preceptor to develop a detailed proposal for a public health capstone project.

**Prerequisites:** PUBH 401

**PUBH 411 Public Health Internship and Capstone II (execution) 6 Credits**

In this course, students will implement and evaluate the public health capstone project proposed in "Public Health Internship and Capstone II". Students will work with the site preceptor to develop planned deliverables for the internship site. A final capstone report, oral presentation and preceptor evaluation will be required.

**Prerequisites:** PUBH 410