# **GLOBAL PUBLIC HEALTH AND SCIENCE (BS)**

NYSED: 35040 HEGIS: 1214.00 CIP. 51.2201

## **Program Description**

The highly selective, demanding undergraduate co-majors in Global Public Health (GPH) allow CAS students to choose a course of study that is a combination of public health and an academic discipline housed in the College (GPH is not a stand-alone major), and also provide them with instructors and courses drawn from the entire university. This unique structure responds to the ever-increasing demand for interdisciplinary public health practitioners both in the U.S. and abroad. The coursework is integrated with experiential learning and study away requirements to ensure that students are broadly trained and uniquely prepared for a variety of careers.

The programs' global public health courses are offered by the NYU School of Global Public Health (GPH). GPH delivers truly interdisciplinary public health education at the undergraduate, master's, and doctoral level. It builds on the global reach of NYU's unique Global Network University, draws strength from the entrepreneurial spirit of NYU's many talented faculty and students, and serves as a conduit for groundbreaking research and education that advances and promotes equitable health for all.

Students interested in this major will choose one of the following concentrations:

### **Concentrations** Global Public Health and Biology

Students pursuing a major in Biology and co-major in Global Public Health complete a concentration in Biology that emphasizes one of the following areas: genetics and genomics, infectious diseases, or environmental health. This plan of study provides a unique opportunity for students to explore cutting-edge life science and how recent advances can help address some of the world's most complex health challenges. Graduates are well-prepared to pursue professional studies in medicine, dentistry, public health, and nutrition, as well as academic and research positions.

Departmental advising is absolutely crucial for students pursuing this demanding major and co-major. Students must satisfy all requirements of the College Core Curriculum (the First-Year Seminar, foreign language, expository writing, and Foundations of Contemporary Culture). Careful planning is necessary to ensure that all major, prehealth, and College Core Curriculum requirements can be completed in four years.

Students in this plan of study must consult with the DUS or other departmental adviser to work out a course plan, especially as students are required to study away for one semester.

#### Honors in Global Public Health and Biology

To earn joint honors in Global Public Health and Biology, a student must complete an independent research project, present the project in the form of a written thesis and oral defense, and have a GPA of at least 3.65 overall and in the major.

Honors students must take research for credit, either the 4-credit Independent Laboratory Research (NYU Biology) or the 4-credit Independent Laboratory Research (External Institution). This course can be used to fulfill the lab skills requirement of the Biology major or a major elective in the joint Global Public Health and Biology major.

We strongly recommend that students complete these credits before the end of their junior year to gather data in advance of the fall honors course below. If necessary, it is possible to register for research credits as a corequisite in fall of senior year.

Students must also complete two additional honors courses in the senior year. In the fall they take Becoming a Scientist (BIOL-UA 995) (https://courses.bio.nyu.edu/course/biol-ua-995/) (4 credits), followed by Undergraduate Research Thesis (BIOL-UA 999) (https:// courses.bio.nyu.edu/course/biol-ua-999/) (2 credits) in the spring. Students may apply for BIOL-UA 999 using this form (https:// docs.google.com/forms/d/e/1FAIpQLScjNN24UiUYqdH2nsjfJ7-LAKH8fcDyUrKvpynolOcLwZuaDQ/viewform/). The honors courses do not count as electives in the Biology or Global Public Health and Biology major.

#### **Global Public Health and Chemistry**

Students pursuing this combined program will concentrate in chemistry -the central natural science that bridges physics and mathematics with the life sciences.

Departmental advising is absolutely crucial for students pursuing this demanding major and co-major. As with all majors and minors offered by the Department of Chemistry, BIOL-UA 11 (https://bulletins.nyu.edu/search/?P=BIOL-UA%2011) Principles of Biology I, BIOL-UA 12 (https://bulletins.nyu.edu/search/?P=BIOL-UA%2012) Principles of Biology II, are not required for this major; however, prehealth students must take this sequence in addition to the major requirements outlined below. In addition, students must satisfy all requirements of the College Core Curriculum (the First-Year Seminar, foreign language, Expository Writing, and Foundations of Contemporary Culture). Careful planning is necessary to ensure that all major, prehealth, and College Core Curriculum requirements can be completed in four years.

Students in this plan of study must consult with the DUS or other departmental adviser to work out a course plan, especially as students are required to study away for one semester.

#### Honors in Global Public Health and Chemistry

Students seeking joint honors in Global Public Health and Chemistry must complete an honors thesis based on independent experimental or theoretical research. To pursue an honors degree, students are required to enroll in CHEM-UA 995 (https://bulletins.nyu.edu/search/?P=CHEM-UA%20995) Senior Honors in Chemistry and CHEM-UA 996 (https://bulletins.nyu.edu/search/?P=CHEM-UA%20996) Senior Honors Chemistry during their senior year.

Admission to the honors program requires approval from the director of undergraduate studies before the end of their junior year. Students must also maintain a minimum GPA of 3.65, both overall and within the major.

The final component of the honors work is a senior thesis, which must be approved by the faculty adviser and presented in a seminar during the spring semester of the senior year. Because of the rigor of the GPH/ Science concentration, students interested in pursuing honors are strongly encouraged to consult with the Department of Chemistry as early as possible to ensure they can meet all requirements.

## Admissions

New York University's Office of Undergraduate Admissions supports the application process for all undergraduate programs at NYU. For additional information about undergraduate admissions, including application requirements, see How to Apply (https://www.nyu.edu/admissions/ undergraduate-admissions/how-to-apply.html).

## **Program Requirements**

Students must choose one of the concentrations below:

## **Global Public Health and Biology**

Students in this concentration must consult with the DUS or other departmental adviser to work out a course plan, especially as this major requires students to study away for one semester. The concentration requires twenty-two courses (94 credits) completed with a grade of C or higher.

Course	Title	Credits
<b>General Education</b>	n Requirements	
First-Year Semina	r	4
EXPOS-UA 1	Writing as Inquiry	4
Foreign Language	, <sup>1</sup>	16
Texts and Ideas		4
Cultures and Cont	texts	4
Societies and the	Social Sciences	4
Expressive Cultur	e	4
Major Requirement	nts	
Global Public Heal	th Requirements	
UGPH-GU 10	Health and Society in a Global Context (no prerequisites) <sup>2</sup>	4
BIOL-UA 42	Biostatistics	4
or BIOL-UA 45	Biostatistics and Human Genetics	
UGPH-GU 30	Epidemiology for Global Health	4
UGPH-GU 40	Health Policy in a Global World	4
UGPH-GU 50	Environmental Health in a Global World	4
UGPH-GU 60	Undergraduate Experiential Learning in Global Public Health	4
Biology Core Cours	ses <sup>3</sup>	
BIOL-UA 11	Principles of Biology I	4
BIOL-UA 12	Principles of Biology II	4
BIOL-UA 21	Molecular and Cell Biology I	4
BIOL-UA 22	Molecular and Cell Biology II	4
Biology Emphasis	Area	
BIOL-UA 223	Molecular and Cell Biology Laboratory <sup>4</sup>	1
Select two upper-	level biology courses from one of these three are	as: 8
Genetics and G	Genomics	
Infectious Dise	ases	
Environmental Health		
Additional Require	ed Courses in Science and Mathematics	
Chemistry		
CHEM-UA 125	General Chemistry I & Laboratory	5
CHEM-UA 126	General Chemistry II & Laboratory	5
CHEM-UA 225	Organic Chemistry I & Laboratory	5
CHEM-UA 226	Organic Chemistry II & Laboratory	5

Total Credits		134
Combined Major Electives (select three electives) $^{5}$		12
Combined Electives		
MATH-UA 121	Calculus I	4
Mathematics		
PHYS-UA 12	General Physics II	5
PHYS-UA 11	General Physics I	5
Physics		

<sup>1</sup> The foreign language requirement is satisfied upon successful completion through the Intermediate level of a language. This may be accomplished in fewer than 16 credits, but those credits must then be completed as elective credit.

- <sup>2</sup> UGPH-GU 10 Health and Society in a Global Context is the prerequisite or corequisite for UGPH-GU 20 Biostatistics for Public Health, UGPH-GU 30 Epidemiology for Global Health, UGPH-GU 40 Health Policy in a Global World, and UGPH-GU 50 Environmental Health in a Global World.
- <sup>3</sup> Note: Biology majors are not required to register for the 1-credit BIOL-UA 123 Principles of Biology Laboratory. It is intended for prehealth students not majoring in biology.
- <sup>4</sup> This course is strongly recommended. Brings total credit requirement to 135 credits.
- <sup>5</sup> All students must complete: one additional upper-level biology elective (see the Department of Biology's website for approved courses); one approved GPH elective; and a third approved elective in either biology or GPH.

## **Global Public Health and Chemistry**

Students in this concentration must consult with the DUS or other departmental adviser to work out a course plan, especially as this major requires students to study away for one semester. The concentration requires twenty-one courses (90 credits) completed with a grade of C or higher.

Course	Title	Credits
<b>General Education</b>	n Requirements	
First-Year Seminar		
EXPOS-UA 1	Writing as Inquiry	4
Foreign Language <sup>1</sup>		16
Texts and Ideas		4
Cultures and Cont	texts	4
Societies and the	Social Sciences	4
Expressive Culture		4
Major Requirement	nts	
Global Public Heal	th Requirements	
UGPH-GU 10	Health and Society in a Global Context (no prerequisites) $^2$	4
UGPH-GU 20	Biostatistics for Public Health	4
UGPH-GU 30	Epidemiology for Global Health	4
UGPH-GU 40	Health Policy in a Global World	4
UGPH-GU 50	Environmental Health in a Global World	4
UGPH-GU 60	Undergraduate Experiential Learning in Global Public Health	4
Chemistry Core Courses		
CHEM-UA 125 & CHEM-UA 126	General Chemistry I & Laboratory and General Chemistry II & Laboratory <sup>3</sup>	10

Select one of the following:

Total Credits		130
Combined Major Electives (select three electives) <sup>6</sup>		12
<b>Combined Electiv</b>	es	
PHYS-UA 12	General Physics II <sup>5</sup>	Ę
PHYS-UA 11	General Physics I <sup>5</sup>	5
Physics		
MATH-UA 122	Calculus II <sup>4</sup>	4
MATH-UA 121	Calculus I	2
Mathematics		
Additional Requir	ed Courses in Science and Mathematics	
CHEM-UA 881 & CHEM-UA 882	and Biochemistry I	ξ
& CHEM-UA 652	and Thermodynamics & Kinetics	,
CHEM-UA 651	Quantum Mechanics & Spectroscopy	8
CHEM-UA 227 & CHEM- UA 228	Majors Organic Chemistry I & Laboratory and Majors Organic Chemistry II & Laboratory	
CHEM-UA 225 & CHEM- UA 226	Organic Chemistry I & Laboratory and Organic Chemistry II & Laboratory	

<sup>1</sup> The foreign language requirement is satisfied upon successful completion through the Intermediate level of a language. This may be accomplished in fewer than 16 credits, but those credits must then be completed as elective credit.

- <sup>2</sup> UGPH-GU 10 Health and Society in a Global Context is the prerequisite or corequisite for UGPH-GU 20 Biostatistics for Public Health, UGPH-GU 30 Epidemiology for Global Health, UGPH-GU 40 Health Policy in a Global World, and UGPH-GU 50 Environmental Health in a Global World.
- <sup>3</sup> The one-semester CHEM-UA 129 Accelerated General Chemistry may be taken by qualified students and substitutes for this sequence.
- <sup>4</sup> Advanced Placement credit for Calculus II (a score of 5 on BC Calculus) is not accepted for this major requirement. Students with this AP credit must either (1) take Calculus II at NYU and forfeit 4 of the 8 AP credits, or (2) register for one of the following: CHEM-UA 140 Mathematics of Chemistry, MATH-UA 123 Calculus III or MATH-UA 140 Linear Algebra, using the BC credits as a prerequisite.
- <sup>5</sup> Credit for AP Physics C: Mechanics is accepted for PHYS-UA 11 General Physics I and credit for AP Physics C: Electricity and Magnetism is accepted for PHYS-UA 12 General Physics II, but only for students who are not prehealth. No other AP or equivalent international credit is accepted. (Because of medical, dental, etc., school admissions requirements, students on the prehealth track cannot use AP Physics C credit to place out of either or both semesters of General Physics.)
- <sup>6</sup> Three additional electives must be completed in the GPH program or chemistry, by advisement.

## **Study Away**

All majors must also study away for one semester. Programs of study are planned with the director of undergraduate studies in the chosen CAS department. The e-mail address for general inquiries from CAS students is cas.gph@nyu.edu.

#### Sample Plan of Study Global Public Health and Biology

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ht Semester/Term     Principles of Biology I     4       BIOL-UA 125     General Chemistry I & Laboratory     5       MATH-UA 125     Calculus I     4       First-Year Seminar     4       Codits     9       201 Semester/Term     9       BIOL-UA 126     General Chemistry II & Laboratory     4       CHEM-UA 126     General Chemistry II & Laboratory     5       UGPH-GU 10     Health and Society in a Global Context     4       EXPOS-UA 1     Writing as Inquiry     4       BIOL-UA 21     Molecular and Cell Biology I     4       BIOL-UA 225     Organic Chemistry II & Laboratory (strongly recommended; total credits for degree will equal 135)     1       CHEM-UA 225     Organic Chemistry I & Laboratory     5       Foreign Language     4       Edthem-UA 225     Organic Chemistry I & Laboratory     5       Foreign Language     4       CHEM-UA 225     Organic Chemistry II & Laboratory     5       Foreign Language     4       CHEM-UA 225     Organic Chemistry II & Laboratory     5       Foreign Language     4       CHEM-UA 225     Organic Chemistry II & Laboratory     5       Foreign Language     4       UGPH-GU 30     Epidemiology for Global Health     4       UGPH-GU 42 </th <th>Course</th> <th>Title</th> <th>Credits</th>	Course	Title	Credits	
BIOL-UA 11     Principles of Biology I     4       CHEM-UA 125     General Chemistry I & Laboratory     5       MATH-UA 121     Calculus I     7       Pirst-Year Seminar     Credits     17       Znd Semester/Term     III     4       BIOL-UA 12     Principles of Biology II     4       Credits     17       Znd Semester/Term     III     4       BIOL-UA 12     General Chemistry II & Laboratory     4       Credits     17     4       Zorderits     17     4       Sid Semester/Term     III     6       BIOL-UA 21     Molecular and Cell Biology Laboratory (strongly in recommend; total credits for degree will equal 135)     1       Sid Semester/Term     17     4       BIOL-UA 22     Molecular and Cell Biology Laboratory (strongly in a recommend; total credits for degree will equal 135)     1       Foreign Language     4     4       Texts and Ideas     4     4       Verdits     17     4       Historie Chemistry I & Laboratory     5     5       Foreign Language     4     4       UCHA 22     Molecular and Cell Biology Laboratory (strongly in a diodas)     4       Credits     17     5       Foreign Language     4     4 <t< td=""><td>1st Semester/Term</td><td></td><td></td></t<>	1st Semester/Term			
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			16	

Students select two upper-level Biology courses from one of the following three areas: genetics and genomics; infectious diseases; or environmental health; a current list of courses satisfying each area is maintained on the official website of the Department of Biology.

- <sup>2</sup> Must be completed by all students pursuing this concentration; a current list of upper-level courses satisfying this requirement is maintained on the official website of the Department of Biology.
- <sup>3</sup> Chosen from courses in the GPH program or in Biology, by advisement.

#### **Global Public Health and Chemistry**

Course	Title	Credits
1st Semester/Term		
CHEM-UA 125	General Chemistry I & Laboratory	5
MATH-UA 121	Calculus I	4
UGPH-GU 10	Health and Society in a Global Context	4
First-Year Seminar		4
	Credits	17
2nd Semester/Term		
CHEM-UA 126	General Chemistry II & Laboratory	5
MATH-UA 122	Calculus II	4
UGPH-GU 20	Biostatistics for Public Health	4
Expository Writing		4
	Credits	17
3rd Semester/Term		
CHEM-UA 225 or CHEM-UA 227	Organic Chemistry I & Laboratory or Majors Organic Chemistry I & Laboratory	5
UGPH-GU 30	Epidemiology for Global Health	4
Foreign Language		4
Texts and Ideas		4
	Credits	17
4th Semester/Term		
CHEM-UA 226	Organic Chemistry II & Laboratory	5
or CHEM-UA 228	or Majors Organic Chemistry II & Laboratory	
UGPH-GU 40	Health Policy in a Global World	4
Foreign Language		4
Cultures and Contexts		4
	Credits	17
5th Semester/Term		
CHEM-UA 881	Biochemistry I	4
PHYS-UA 11	General Physics I	5
Foreign Language		4
Expressive Culture		4
	Credits	17
6th Semester/Term		
CHEM-UA 882	Biochemistry II	4
PHYS-UA 12	General Physics II	5
Foreign Language		4
Societies and the Social So	ciences	4
	Credits	17
7th Semester/Term		
CHEM-UA 651	Quantum Mechanics & Spectroscopy	4
UGPH-GU 50	Environmental Health in a Global World	4
Additional Major Elective 1	of 3 <sup>1</sup>	4
Additional Major Elective 2	of 3 <sup>1</sup>	4
	Credits	16
8th Semester/Term		
CHEM-UA 652	Thermodynamics & Kinetics	4
UGPH-GU 60	Undergraduate Experiential Learning in Global Public Health	4
Additional Major Elective 3	of 3 <sup>1</sup>	4
	Credits	12
	Total Credits	130

<sup>1</sup> Chosen from courses in the GPH program or in Chemistry, by advisement.

## **Learning Outcomes**

Upon successful completion of the program, graduates will:

#### Biology

- 1. Demonstrate a foundation of knowledge in current concepts of, and the mechanisms underlying, living systems.
- 2. Utilize skills that enable them to reason critically and to analyze primary literature in the life sciences.
- 3. Conduct problem-solving, including quantitative analysis.
- 4. Use the scientific method to design and implement controlled experiments or tests to address explicit hypotheses.
- 5. Communicate scientific ideas in both oral and written formats, and also colloborate on common scientific projects.
- 6. Recognize key historical milestones in the development and evolution of the field of public health with examples from both the U.S. and international contexts.
- 7. Describe and assess the biological, social, environmental, and structural determinants of health by applying interdisciplinary approaches and methodologies.
- 8. Explain key data analytic techniques and epidemiologic concepts for measuring disease occurrence and frequency and how the information obtained from these measures is used to assess the health of populations.
- 9. Apply public health promotion and prevention concepts to engage in collaborative and culturally relevant public health activities.
- 10. Connect public health concepts to disciplinary practice in the field.

#### Chemistry

- 1. Demonstrate a fundamental command of chemistry, as well as of the subdisciplines of organic, inorganic, and physical chemistry.
- 2. Display mastery of laboratory skills in organic and physical chemistry.
- Demonstrate familiarity with contemporary problems in chemistry and both articulate these problems and propose well-considered solutions.
- 4. Demonstrate expertise in modern research methods as applied in contemporary scientific studies.
- 5. Recognize key historical milestones in the development and evolution of the field of public health with examples from both the U.S. and international contexts.
- 6. Describe and assess the biological, social, environmental, and structural determinants of health by applying interdisciplinary approaches and methodologies.
- 7. Explain key data analytic techniques and epidemiologic concepts for measuring disease occurrence and frequency and how the information obtained from these measures is used to assess the health of populations.
- 8. Apply public health promotion and prevention concepts to engage in collaborative and culturally relevant public health activities.
- 9. Connect public health concepts to disciplinary practice in the field.

## **Policies**

#### **Program Policies**

# General Policies Applying to the Combined Global Public Health Majors

CAS students are allowed to count 16 credits from the other schools of the University toward the baccalaureate degree. Four of the six core UGPH-GU courses required for the combined GPH majors are treated as liberal arts courses and therefore do not count against the 16-credit allowance: UGPH-GU 10, 20, 30, and 50. (These four courses are exempt from the 16-credit rule both for declared GPH majors and also for CAS students who simply take one or more of them as electives.) The two required GPH core courses UGPH-GU 40 and 60 are not exempt from the 16-credit rule, and together use up 8 credits of each student's 16-credit allowance. Any other UGPH-GU courses besides 10, 20, 30, and 50 will also count against the 16 credits.

Students may request additional non-CAS, non-liberal arts credits beyond the 16-credit limit through the College Advising Center, 25 West 4th Street, 5th floor; 212-998-8130.

No UGPH-GU courses can count toward the 64 credits that internal or external transfer students are required to complete in CAS (-UA) courses.

Students must earn a C or better in all courses for their combined major and maintain a 2.0 major GPA. Courses graded Pass/Fail cannot be counted toward the major.

The GPH tracks with Anthropology, History, and Sociology all satisfy the College Core Curriculum requirement in Societies and the Social Sciences. However, the two GPH concentrations in science do not satisfy this requirement. None of the UGPH-GU courses can exempt students from any part of the Core's Foundations of Contemporary Culture.

## Transfer Student Policies Applying to the Combined Global Public Health Majors

Transfer students to CAS must complete at least half of their entire combined GPH major at NYU, with at least half of the CAS coursework required for the major completed at NYU. In addition, GPH stipulates that transfer credit cannot be used for more than one of the six core GPH requirements (the other five must always be completed at NYU). The internship course (UGPH-GU 60) can never be satisfied with transfer credit.

Applicants to schools of the health professions who are pursuing one of the science GPH majors must complete at least five of the required prehealth science courses at NYU in order to be eligible for a committee interview and letter from the CAS Preprofessional Advising Center.

Some transfer students may therefore be required to complete more than half of their GPH major at NYU to satisfy these policies, regardless of transfer coursework presented.

#### **School of Engineering courses**

No CAS student (whether pursuing a major in Global Public Health or not) is allowed to take Tandon substitute courses for CHEM-UA 125, 126, 127, 128, 129 (General Chemistry); 225, 226, 227, 228 (Organic Chemistry); 651, 652, 661 (Physical Chemistry); 711 (Inorganic Chemistry); or 881, 882, 885, 890 (Biochemistry). However, students pursuing a major in the Department of Chemistry may seek prior permission of the director of undergraduate studies to take advanced electives in the School of Engineering and apply them to the major. This is reviewed on a case-by-case basis. These courses count against each student's 16-credit

allowance in the other divisions of NYU and cannot be applied to the 64credit UA residency requirement.

#### **NYU Policies**

University-wide policies can be found on the New York University Policy pages (https://bulletins.nyu.edu/nyu/policies/).

#### **College of Arts and Science Policies**

A full list of relevant academic policies can be found on the CAS Academic Policies page (https://bulletins.nyu.edu/undergraduate/artsscience/academic-policies/).