Master of Science in Global Health

Structure of Global Health MS program
A Common Core and 4 Concentrations

- Every concentration has the same 12 credit common core grounded in global health fundamentals plus a zero credit graduate seminar series.

  IGS5XX Perspectives on Global Health (3 credits)
  DEV540 Research Design Methods for Development (3 credits)
  IGS595 Graduate Qualifying Project (6 credits
  IGS555: Collaboration for a Better World Seminar Series (0 credits)

- Each specific concentration has 9 required credits from a selective list of courses.

- Each specific concentration has 9 credits from a selective list of elective courses.

The Global Health Program
A Common Core and 4 Concentrations

1. Global Health Management and Assessment
    - Focuses on understanding the challenges in operations and management of global healthcare systems
2. Analytics and Modeling in Global Health
    - Focuses on the application of data analytics skills to challenging problems in global health (e.g., data management for healthcare systems, pharmaceutical research and discovery, or AI and machine learning for disease detection)
3. Mobile Applications for Global Health
    - Targets students with backgrounds in computing, gaming, design, and AI in Design where there are exciting frontiers opening in applications for Global Health
4. Engineering Solutions for Global Health
    - Focuses on understanding and addressing the challenges for engineering solutions in diverse global contexts, including how to work in settings with institutional and cultural diversity.

The 4 concentrations have been reviewed by participating departments & schools including letters of support or non-opposition by:

School of Arts and Sciences
School of Business
School of Engineering
The Global School
Social Science and Policy Studies Department
Data Science Program
Business Department
Mathematical Sciences Department
Bioinformatics & Computational Biology Program
Biomedical Engineering Department
Interactive Media and Game design Department
Biology Biotechnology Department
System Dynamics Program
Computer Science Department

Learning objectives for the global health program

Students will develop the ability to:

a. identify social determinants of health as it relates to equity, inclusion, justice, and transformative technology for social good.
b. identify major global health challenges and some of the key global health policies that have been proposed as responses.
c. compare the organization, structure and function of health care, health, and regulatory systems across national and international settings.
d. demonstrate awareness of cultural values, ethical considerations and practices across diverse cultural domains.
e. identify appropriate analytical tools to address global health solutions

Overall for the degree: three courses were developed in collaboration with the sponsoring department

- Perspectives in Global Health (3 credits)
- Epidemiology (3 credits)
- Collaboration for a Better World Seminar Series (0 credits)

An Example

Concentration 2: Analytics and Modeling in Global Health

The Global Health degree with a concentration in analytics and modeling is for students interested in quantitative methods and data analytics and applying these skills to challenging problems in global health.

Students in this concentration will take:

- The 4 required core courses for the degree: Perspectives in Global Health, Epidemiology, Research design methods and a GQP
- They will choose from a selective set of required courses for the concentration
- Students will take electives that focus specifically on the concentration

Concentration 2 Course Menu

Required core courses for all tracks:

- IGS5XX Perspectives on Global Health (3 credits)
- DEV540 Research Design Methods for Development (3 credits)
- IGS595 Graduate Qualifying Project (6 credits)

IGS555: Collaboration for a Better World Seminar Series (0 credits)

Choose 3 courses for this specific concentration (9 credits):

- DS517 Mathematical Fundamentals for Data Science
- SD553 Modeling Analytics and Evaluation Techniques
- DS501 Introduction to Data Science
- SSPS5XXX Epidemiology
- IGS505 Qualitative Methods for Community Engaged Research

Choose 3 General elective courses for this pathway (9 credits):

MA511 Applied Statistics for Engineers and Scientists
SD550 System Dynamics Foundation: Managing Complexity
CS 5007 Introduction to Programing Concepts
CS582 or BCB502 or CS573 Data Visualization
CS503: Foundations of Computer Science
CS542 Database Management
IGS510 Human Dimensions of Global Environmental Change
MIS573 System Design and Development
ETR500 Entrepreneurship & Innovation
SD500 Introduction to System Dynamics
BCB501 Bioinformatics
BCB 504 Statistical Methods in Genetics and Bioinformatics
DS595: Machine Learning for Engineering and Science Applications
SD553 Model Analyses and Evaluation
BUS500 Business Law, Ethics, and Social Responsibility
MA 547 Design and Analysis of Observational and Sampling Studies
MA 542 Regression Analysis
MA 559 Time Series Analysis

Outcomes for Analytics and Modeling in Health and Disease

After taking this concentration, students will have the ability to:

- Understand key challenges in global health that would benefit from data analytics, modeling and other new techniques in machine learning.
- Interpret results for qualitative analysis for health research, policy or practice.
- Understand key global health policies surrounding data privacy, transferability, and accessibility.
- Analyze quantitative and qualitative data using biostatistics and computational methods and tools, as appropriate.
- Select quantitative and collection methods appropriate for global health. qualitative epidemiological data

Current (Inter)national Study Sites with interest in GQP's

- University of Johannesburg, South Africa
- American University of Armenia, Yerevan Armenia
- University of Ghana, Accra, Ghana
- University of Puerto Rico – Medical Sciences Campus, San Juan
- Local and Regional Partners:
  - e.g. UMass Medical Center
  - Worcester Department of Health
  - our own WPI research laboratories to name a few

many others identified to explore after approval

Management

- Application team – One member from each School
- Director – Identified
- Faculty Advisory Committee- Identified
- Faculty – Those who teach courses in Global Health and desire an affiliation with the program.
- External Advisory Committee – To be established in year two

Project coordinator – Year two/ three identifies a budgeted for a part time program coordinator and until then it is the responsibility of the Director.