

## GLOBAL HEALTH TECHNOLOGIES

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THE GEORGE R. BROWN SCHOOL OF ENGINEERING,  
THE WEISS SCHOOL OF NATURAL SCIENCES, THE  
SCHOOL OF HUMANITIES, AND THE SCHOOL OF  
SOCIAL SCIENCES

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### DEGREES OFFERED: NONE

The Department of Bioengineering collaborates with a number of departments to offer Rice undergraduate students a minor in global health technologies (GLHT) through the Beyond Traditional Borders (BTB) initiative—a unique, multidisciplinary program to educate and train students to reach beyond traditional disciplinary and geographic boundaries to understand, address, and solve global health disparities. With complementary contributions from the humanities, social science, policy, bioscience, and engineering programs at Rice, the GLHT minor prepares students to integrate diverse perspectives as they develop solutions to the complex problems of global health, using the formal approach of the engineering design process.

Advances in biotechnology and bioengineering are transforming how disease is detected and treated, and have led to significant advances in health over the last 50 years. Developing countries, however, have largely missed out on the gains in health enjoyed by the rest of the world, and the HIV/AIDS pandemic has greatly increased the complexity of health challenges faced by the world's poorest regions. With the GLHT minor, BTB aims to create future leaders who can develop effective solutions to significant world health challenges. Many students pursuing the GLHT minor—having been trained to develop and implement appropriate biotechnology and bioengineering solutions that integrate scientific, engineering, health, policy, and economic data perspectives—enter careers in medicine, public health, public policy, and international development.

Students begin the GLHT minor sequence (5 core courses and 2 elective courses) in a multidisciplinary gateway course and then move into 1 of 2 tracks based on their major course of study for teaching focused on their area of expertise. Having fostered a command of specialized knowledge relevant to the development of technologies appropriate for resource-constrained settings, students conclude the GLHT minor with a common capstone course that enables them to benefit from one another's proficiencies as they work in interdisciplinary teams to address a global health challenge.

- In the Engineering and Science track, undergraduates take a series of courses leading to a year-long capstone design experience. A freshman seminar-style course, BIOE 260 *Introduction to Global Health Issues*, introduces students to the range of challenges faced by the least developed countries in the pursuit

of healthy populations. Guest speakers from relevant departments at Rice and from BTB collaborating institutions make the course accessible to students of all disciplines. Two subsequent core courses, BIOE 361 *Metabolic Engineering for Global Health Environments* and BIOE 362 *Bioengineering for Global Health Environments*, provide students with expertise in biotechnology and bioengineering applied to international health problems. Finally, BIOE 461/462 *Global Health Design Challenges* requires multidisciplinary teams of students, mentored by interdisciplinary faculty teams, to work together in a 2-semester course to develop a solution to an international health challenge.

- Likewise, Humanities, Social Science, and Policy track undergraduates completing the GLHT minor take a series of courses, also leading to the capstone design experience BIOE 461/462 *Global Health Design Challenges*. Together with science and engineering students, they begin with the freshman course BIOE 260 *Introduction to Global Health Issues*. Two subsequent core courses, BIOS 122 *Fundamental Concepts in Biology* and BIOE 301 *Bioengineering and World Health*, provide an overview of scientific, economic, and policy issues associated with biotechnology and bioengineering advances to address global health needs.

### **REQUIREMENTS FOR MINORING IN GLHT**

Students must complete 5 core courses in the science and engineering track or the humanities, social science, and policy track, depending upon their major course of study. In addition to the core course sequence, students must complete a minimum of 2 elective courses.

#### **Science and Engineering Track Core Courses**

- BIOE 260 *Introduction to Global Health Issues*
- BIOS 361 *Metabolic Engineering for Global Health Environments*
- BIOE 362 *Bioengineering for Global Health Environments*
- BIOE 461/462 *Global Health Design Challenges*

#### **Humanities, Social Science, and Policy Track Core Courses**

- BIOE 260 *Introduction to Global Health Issues*
- BIOS 122 *Fundamental Concepts in Biology*
- BIOE 301 *Bioengineering and World Health*
- BIOE 461/462 *Global Health Design Challenges*

All core courses will be offered each year: BIOS 122, BIOE 301, BIOE 362, and BIOE 461 in the fall and BIOE 260, BIOS 122, BIOS 361, and BIOE 462 in the spring. The sequence indicated is the recommended sequence, and prerequisites may apply, although some flexibility is possible. Prior to enrollment in the capstone course BIOE 461/462, students must successfully complete all other GLHT minor core course requirements per their track, although electives may be taken concurrently. There is no requirement to initiate the GLHT minor in the freshman year. It can be initiated as late as the junior year (beginning of the fifth semester). It will be possible for students to receive credit for GLHT minor courses that also fulfill a requirement within their major. Students can petition the GLHT minor advisory committee to accommodate a change in their major course of study that impacts their minor track selection.

### **ELECTIVE COURSES**

For a list of approved elective courses, covering a wide range of relevant topics, please visit [www.beyondtraditionalborders.rice.edu](http://www.beyondtraditionalborders.rice.edu) and/or speak with the minor advisors.

### **ADMISSION**

All GLHT minor courses are open to all Rice students, including those not pursuing the GLHT minor, with the exception of the capstone course BIOE 461/462 which is restricted to students completing the GLHT minor. For BIOE 260, the gateway course to the GLHT minor, students are required to submit a short application (available at [www.beyondtraditionalborders.rice.edu](http://www.beyondtraditionalborders.rice.edu)) to gain instructor permission to register for the course. Preferential admission to BIOE 260 will be given to students who indicate they are seeking to complete the GLHT minor course of studies.