HUMANITARIAN ENGR SCI & TECH (HEST)

HEST 241. HOUSEHOLD ENERGY IN GUATEMALA: BACKGROUND. (1 Credit)
An introduction to the technical, social, environmental, and economic
issues surrounding energy needs for households in developing countries
and the technologies and policies needed to help address them.
Students are introduced to concepts about global development, needs
assessment and co-design, qualitative and quantitative evaluation, and
local socioeconomic conditions. This course is preparation for the 10-
day Summer HEST 242 faculty-led study abroad course in Guatemala.
Students from any major are invited to participate in this multidisciplinary
course series.

HEST 242. HOUSEHOLD ENERGY IN GUATEMALA: APPLICATIONS. (3 Credits)
Through immersion in rural communities during this 10-day
interdisciplinary study abroad course, students will gain a deeper
understanding of household energy needs in developing countries,
as well as the social, environmental, technical, and economic issues
surrounding technologies and policies to help meet these needs. The
outcomes produced by a variety of household technologies such
as biomass cookstoves will be evaluated through qualitative and
quantitative data gathering, including experiments, observations, and
surveys, giving students the chance to practice their research and cross-
cultural communication skills under a variety of circumstances.
Recommended: HEST 241

HEST 299. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 310. INTRO TO COMMUNITY ENGAGEMENT AND COMMUNITY-
BASED DESIGN. (3 Credits)
Includes study of civic problems and issues, design-thinking concepts
and application to co-design of engineering, science and technology-
based solutions with social impact, and development for dispositions
for effective community engagement through field study and service-
learning. Recommended course for student wanting to complete a HEST
internship. (Bacc Core Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 320. ENGINEERING FOR GLOBAL HEALTH SOLUTIONS. (3 Credits)
An introduction to the critical processes and drivers involved in the
development of engineering solutions to address global health problems.
Topics include world health challenges, accessing and interpreting health
and economic data, basic healthcare systems around the world, the
importance of ethical guidelines in ensuring the protection of human
subjects, the process of cost effectiveness assessment of a technology,
and the timescale and hurdles to adoption of a technology. (Bacc Core
Course)
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 499. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.

HEST 411. ENGINEERING DESIGN FOR EMERGENCY & LOW-RESOURCE
ENVIRONMENTS. (3 Credits)
Introduces the challenges of engineering in emergency and low-resource
environments, concepts of appropriate technologies and response, and
engineering design of discrete services and technologies such as water
systems, environmental health systems and infrastructure.
Recommended: Completion of an undergraduate engineering fluid
mechanics course

HEST 412. MULTIDISCIPLINARY CASE STUDIES IN HUMANITARIAN
ENGINEERING, SCIENCE AND TECHNOLOGY. (3 Credits)
Introduces students to multidisciplinary methods and perspectives
applied to case studies in humanitarian engineering, science and
technology. Applications to real world issues with global implications
at the interface of humanity and nature are addressed from a systems
perspective using a case study approach.
Attributes: CSST – Core, Synthesis, Science/Technology/Society

HEST 541. HOUSEHOLD ENERGY IN GUATEMALA: BACKGROUND. (1 Credit)
An introduction to the technical, social, environmental, and economic
issues surrounding energy needs for households in developing countries
and the technologies and policies needed to help address them.
Students are introduced to concepts about global development, needs
assessment and co-design, qualitative and quantitative evaluation, and
local socioeconomic conditions. This course is preparation for the 10-
day Summer HEST 542 faculty-led study abroad course in Guatemala.
Students from any major are invited to participate in this multidisciplinary
course series.

HEST 542. HOUSEHOLD ENERGY IN GUATEMALA: APPLICATIONS. (3 Credits)
Through immersion in rural communities during this 10-day
interdisciplinary study abroad course, students will gain a deeper
understanding of household energy needs in developing countries,
as well as the social, environmental, technical, and economic issues
surrounding technologies and policies to help meet these needs. The
outcomes produced by a variety of household technologies such
as biomass cookstoves will be evaluated through qualitative and
quantitative data gathering, including experiments, observations, and
surveys, giving students the chance to practice their research and cross-
cultural communication skills under a variety of circumstances.
Recommended: HEST 541
HEST 599. SPECIAL TOPICS. (1-6 Credits)
This course is repeatable for 9 credits.