

HUMANITARIAN ENGINEERING

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Track Description

Humanitarian engineering is engineering for the betterment of communities, but particularly for underserved communities, communities devastated by natural disasters, and refugee communities. The engineering profession has made world-changing contributions to these communities through infrastructure, water treatment, medical devices, computers and many other technological advancements that continually impact society. This CGE track, and the Cockrell School's Certificate in Humanitarian Engineering takes engineering for society to the next level, providing undergraduate students with a rewarding, multidisciplinary program that allows them to focus their learning around communities that need their help the most.

Students who pursue this track have the opportunity to work on design projects for real customers (such as the International Federation of Red Cross) to address humanitarian needs.

Faculty Mentor(s)

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Organizations & Societies

Humanitarian Engineering Society

ME Undergraduate Elective Courses

ME 337F Nuclear Environmental Protection
ME 354 Introduction to Biomechanical Engineering
ME 354M Biomechanics of Human Movement
ME 363M Energy Technology and Policy
ME 374T Renewable Energy Technology
ME 371D Medical Device Design and Manufacture
ME 378E Nanotechnology for Sustainable Energy
ME 379M Development of a Solar-Powered Vehicle
ME 377K Projects in Mechanical Engineering

Humanitarian Design Courses (REQUIRED: Pick 1)

Projects with Underserved Communities**

- Fall: ES 277K – Project Development with Underserved Communities
- Spring: ES 277L – Project Design with Underserved Communities
- Summer: ES 177L – Project Implementation with Underserved Communities

Humanitarian Product Development**

- Fall: ES 277 – Humanitarian Product Design
- Spring: ES 277 – Humanitarian Project Development

Note that these courses are not substitutes for ME266K/ME266P

Other Elective Courses

(choose one)

AFR372D/HIS350L Medicine in African History
AFR 74E/HIS346L Modern Latin America
ANS361.29/ANT324L/RS373M Biomedicine, Ethics, & Culture
ANS372.26 Global Markets and Local Cultures
ANT324L.24/AFR372G.3 Archaeology of African Thought
ANT324L.37/AFR374E.2 Politics of Race/Violence in Brazil
ANT324L.57/GRG356 Archaeology of Climate Change
ANT324L.17 Nature, Society & Adaptation
GOV328L Intro to Latin American Government & Politics
GOV337M.8 International Politics of Latin America
GRG344K Global Food, Farming, and Hunger GC
GRG356T/HIS 363K Mapping Latin America
GRG356T Landuse/Landcover Change Practice
GRG356T International Development in Africa
GRG357 Medical Geography
SOC321G Global Health Issues/Systems
PHL325C Environmental Ethics
PHL325M Medicine, Ethics, and Society
HIS363K/LAS366 Politics of Food in Latin Amer
HIS363K.2/LAS366.28 Argentina:Populism/Insurrection
HIS364G.6/AFR374C.6/WGS Apartheid: South African History
HIS366N Global History of Disease
ADV324 Communicating Sustainability
CMS340K Communication and Social Change
CTI323 Might and Right among Nations
TC358 Law & Ethics of Climate Change
SOC369K Population and Society

** Please contact faculty mentors for approval or to petition other courses. For course descriptions visit the University Catalog.

Industry Applicability

This certificate program area is appropriate to prepare mechanical engineers for jobs in industry that deal with one or more of the following:

- Design, plan, & operation of manufacturing & service systems (e.g. logistics, warehousing, delivery)
- Revenue management & pricing (e.g. airlines, hospitality)
- Data analytics in industries such as technology & finance
- Strategic management of large engineering projects (e.g. energy)

Selected Examples

1. Biogas Heat Recapture System for Underserved Communities: Improve the performance of an existing biodigester for processing human waste while capturing and using the biogas that is natural product of the anaerobic digestion process.
2. Improvements to Mesquite Flour Production Facility: Develop a new drying process to increase by tenfold the production of a mesquite flour plant in Mexico.
3. Solids Removal for Potable Water Filter System: Design a system for suspended solid removal in water treatment to reduce reliance on chemical sedimentation prior to filtration.