



OFFICE OF THE FACULTY COUNCIL

THE UNIVERSITY OF TEXAS AT AUSTIN

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April 4, 2017

Maurie McInnis
Executive Vice President and Provost
The University of Texas at Austin
MAI 201
Campus Mail Code: G1000

Approved by Executive Vice President and
Provost Maurie McInnis on April 21, 2017

Dear Dr. McInnis:

Enclosed for your consideration and action are proposed changes to the Cockrell School of Engineering chapter in the *Undergraduate Catalog, 2018-2020*. The legislation was classified as being of *general* interest to more than one college or school and was approved by the Faculty Council on a no-protest basis on April 3, 2017. The authority to grant final approval on these changes resides with your office.

- Proposal to Create a Transcript-Recognized Humanitarian Engineering Certificate in the Cockrell School of Engineering Chapter of the Undergraduate Catalog 2018-2020 (D 15028-15036)

Please let me know if you have questions or if I can provide other information concerning these items.

Sincerely,

Alan W. Friedman, Secretary of the General Faculty and Faculty Council

The University of Texas at Austin

Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative
Literature

AWF:dlr

Enclosure

ec: Lydia A. Cornell, Administrative Program Coordinator, Provost's Office
Michelle K. George, Administrative Manager for Faculty Affairs, Provost's Office
Gerald E. Speitel, Associate Dean for Academic Affairs, Cockrell School of Engineering
Brenda A. Schumann, Associate Registrar

DOCUMENTS OF THE GENERAL FACULTY

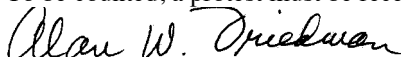
PROPOSAL TO CREATE A TRANSCRIPT-RECOGNIZED HUMANITARIAN ENGINEERING CERTIFICATE IN THE COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE UNDERGRADUATE CATALOG, 2018-2020

Dean Sharon L. Wood in the Cockrell School of Engineering has filed with the Secretary of the Faculty Council the following addition of a Humanitarian Engineering Certificate to the *Undergraduate Catalog, 2018-2020*. On October 15, 2015, the Department of Mechanical Engineering approved the proposal; on March 29, 2016, it was approved by the Engineering Degrees and Courses Committee, and it was approved by Dean Wood on April 6, 2016. The secretary has classified this proposal as legislation of *general* interest to more than one college or school.

The Committee on Undergraduate Degree Program Review recommended approval of the certificate on March 1, 2017, and forwarded it to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. The authority to grant final approval on this legislation resides with the Provost on behalf of the President.

If no objection is filed with the Office of the General Faculty by the date specified below, the legislation will be held to have been approved by the Faculty Council. If an objection is filed within the prescribed period, the legislation will be presented to the Faculty Council at its next meeting. The objection, with reasons, must be signed by a member of the Faculty Council.

To be counted, a protest must be received in the Office of the General Faculty by April 3, 2017.



Alan W. Friedman, Secretary of the General Faculty and Faculty Council
The University of Texas at Austin

Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative Literature

be negligible, one to two students. An engineering technical elective is required and the anticipated enrollment of non-majors in the courses is estimated at one to two students.

Impacted schools must be contacted and their response(s) included:

- 1) College of Liberal Arts
Person communicated with: Professor Richard Flores, Senior Associate Dean for Liberal Arts
Date of communication: October 14, 2015
Response: Approved inclusion of courses from the College of Liberal Arts
- 2) Moody College of Communication
Person communicated with: Professor Steven Reese, Associate Dean for Academic Affairs
Date of communication: October 14, 2015
Response: Approved inclusion of courses from Moody College of Communication
- 3) College of Undergraduate Studies
Person communicated with: Dean Brent Iverson
Date of communication: February 10, 2016
Response: Approved inclusion of courses from College of Undergraduate Studies

4. **OFFICIAL CERTIFICATE NAME:** Undergraduate Certificate: Humanitarian Engineering
5. **Proposed Implementation Date:** Fall 2018
6. **CIP CODE** (administrative unit awarding the certificate): **14.19**
7. **STATEMENT OF OBJECTIVE:** The Cockrell School of Engineering has seen a significant increase in recent years in the number of students wanting to participate in development projects and/or projects that help traditionally underserved populations. The success of Projects for Underserved Communities in which students enroll in a sequence of courses followed by an implementation on site is one example of the Cockrell School's efforts to meet this demand. The Humanitarian Engineering Certificate expands on this by providing a structured program with both technical and non-technical courses to prepare the students for designing and implementing projects or products for underserved communities. Although the certificate is primarily designed for engineering students, any student meeting the requirements would be eligible.
8. **NUMBER OF STUDENTS EXPECTED TO RECEIVE THE CERTIFICATE EACH SEMESTER:**
Ten per semester
9. **NUMBER OF HOURS REQUIRED FOR COMPLETION:** Eighteen hours
10. **LIST FACULTY ON THE CERTIFICATE PROGRAM FACULTY COMMITTEE.**

Name of Faculty Member	College/Department	Title at UT Austin	Highest Degree and Awarding Institution
Janet Ellzey (chair)	Mechanical Engineering	Professor	PhD, UC-Berkeley
Richard Crawford	Mechanical Engineering	Professor	PhD
Carolyn Seepersad	Mechanical Engineering	Associate Professor	PhD, Ga Tech
Edison Thomaz	Electrical and Computer Engineering	Research Assistant Professor	PhD, Ga Tech
Dan Wasserman	Electrical and Computer Engineering	Associate Professor	PhD, Princeton University

Kerry Kinney	Civil, Architectural, and Environmental Engineering	Professor	PhD, University of California at Davis
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11. ACADEMIC COURSE REQUIREMENTS: Use this table to identify the courses that qualify for this certificate program. The seminar course ME179M must be taken either during the time that the student is working on his/her project or after completion of the project.

Course Abbreviation and Number	Course Title	SCH
	(students choose from the following list)	3
UGS 302	Development of Moral Action	
UGS 302	Global Indigenous Cultures	
UGS 302	How to Change the World	
UGS 302	Humanitarian Aid Worker Story	
UGS 302	Language and Culture in Amazonia	
UGS 302	Marketing for Social Profit	
UGS 302	New World/Old World encounters	
UGS 302	Social Entrepreneurship	
UGS 302	Social Inequality/Educ Lat Amer	
UGS 302	Usability and user-centered design	
UGS 302	Globalization and Social Media	
UGS 303	Diff Dialog: Visualizing Cuba	
UGS 303	Diff Dialog: Cultural Identities/differences	
UGS 303	Emerging markets	
UGS 303	Global Inequalities & Health	
UGS 303	Latin Amer Envir Hist/Sustainbl	
UGS 303	Middle East Today	
UGS 303	Our Global Backyard	
SOC 307N	Sociology of Development	
SOC 307K	Fertility and Reproduction	
SOC 308K	Social Change and the Future	
SOC 308N	Compar Relig/Politics/Culture	
SOC 319	Intro to Social Demography	
GRG 305	This Human World: Intro to Geography	
GRG 319	Geography of Latin America	
E E 302	Introduction to Electrical Engineering (with approved project)	
	Additional courses may be substituted for those listed upon approval by the Committee for the Humanitarian Engineering Certificate	
	Engineering Physics and Lab: PHY 303L and PHY103N	4
	Humanitarian engineering project (students choose one of the following (a) (b) (c))	4
	(a) Projects with Underserved Communities sequence)	
ME 279M	Project Development with Underserved Communities	
ME279M	Project Design with Underserved Communities	

<p>ME266K ME 266P or E E 464</p>	<p>(b) Approved project in design sequence: Mechanical Engineering Design Project Mechanical Engineering Design Project Lab Senior Design Project</p> <p>(c) Approved independent study research project</p> <p>Approval for options (b) and (c) must be obtained in advance from the Committee for the Humanitarian Engineering Certificate.</p>	
<p>AFR 372D/HIS 350L AFR 374E/HIS 346L ANS 361.29/ANT 324L/RS 373M ANS 372.26 ANT 324L.24/AFR 372G.3 ANT 324L.37/AFR 374E.2 ANT 324L.57/GRG 356 GOV 328L GOV 337M.8 GRG 344K GRG 356T/HIS 363K GRG 356T GRG 356T GRG356/LAS330 GRG 357 SOC 321G PHL 325C PHL 325M HIS 363K/LAS366 HIS 363K.2/LAS366.28 HIS 364G.6/AFR374C.6/WGS HIS 366N ADV 378 CMS340K</p>	<p>(students choose from the following list)</p> <p>Medicine in African History Modern Latin America Biomedicine, Ethics, & Culture Topic 26: Global Markets and Local Cultures Archaeol of African Thought Pol of Race/Violence Brazil Archaeol of Climate Change Into to Latin American Gov & Pol International Politics Latin America Global Food, Farming, and Hunger GC Mapping Latin America Land use/Land cover Change Practicum Intl Development in Africa Water Resources: Latin American/Caribbean Medical Geography Global Health Issues/Systems Environmental Ethics Medicine, Ethics, and Society Politics of Food in Latin America Argentina: Poplsm/Insurrectn Apartheid: South Africa History Global History of Disease Communicating sustainability Communication and Social Change</p>	3
<p>ARE 323K ARE 346N ASE 374K BME 344 BME 342 BME 358 BME 339 BME 352 CE 341 CE 342 CE 369R CE 377K CE 374K CE 364</p>	<p>(students choose from the following list)</p> <p>Project Management and Economics Building Environmental Systems Space Systems Engr Design Biomechanics Biomechanics of Human Movement Medical Decision Making Biochemical Engineering Advanced Engineering Biomaterials Introduction to Environmental Protection* Water and Waste Water Treatment* Indoor Air Quality Designing Sustainable Nanomaterials* Hydrology* Design of Wastewater and Water Treatment*</p>	3

CE 369L CHE 339 CHE 339T CHE 341 CHE 342 CHE 357 EE 374K EE 374L EE 362R EE 362S EE 339S ME 379M ME 379M ME 337F ME 354M ME 374S ME 379M ME 379M ME 379M ME 379M ME 379M ME 379M	Air Pollution Engineering Introduction to Biochemical Engineering Cell and Tissue Engineering Design for the Environment Chemical Engineering Economics and Business Analysis Technology and the Impact on the Environment Biomedical Electronic Instrument Design Applications of Biomedical Engineering Renewable Energy and Power Systems Development of a Solar-Powered Vehicle Solar Energy Conversion Devices Energy Technology and Policy Introduction to Renewable Energy Engineering and Sustainability Nuclear Environmental Protection Biomechanics of Human Movement Solar Energy Systems Design Clinical Cardiology Design/Control of Robots for Rehabilitation (cancelled) Medical Device Design and Manufacture Nanotechnology for Sustainable Energy Development of a Solar-Powered Vehicle Additional courses may be substituted for those listed upon approval by the Committee for the Humanitarian Engineering Certificate *Approval of instructor required for non-CE majors	
ME179M	Humanitarian Engineering Seminar	1

12. OTHER CERTIFICATE REQUIREMENTS: None

13. GIVE A DETAILED RATIONALE FOR CHANGE(S):

The undergraduate certificate in Humanitarian Engineering provides students with the opportunity to develop expertise in designing and/or implementing projects or products for traditionally underserved populations, e.g., the physically or mentally challenged, low-income or rural communities. This certificate is being proposed in response to student demand for opportunities in this area. The participants will develop not only technical knowledge but also awareness of social, political, and/or economic circumstances that may be important to the development of engineering solutions for underserved populations.

The Department of Mechanical Engineering (ME) is the organizer and manager of this certificate. ME is interested in this area because it aligns with research interests of their faculty, fits in with the degree plan which allows students freedom to choose their upper division electives, and because other universities offering programs in this area have experienced a significant increase in the enrollment of women.

14. COLLEGE/SCHOOL APPROVAL PROCESS:

Department approval date: October 15, 2015	Approved by whom: Jayathi Murthy, Chair, Department of Mechanical Engineering
College approval date: March 29, 2016	Approved by whom: Engineering Degrees & Courses Committee
Dean approval date: April 6, 2016	Approved by whom: Sharon L. Wood

PROPOSED NEW CATALOG TEXT

To be inserted in section Catalogs > Undergraduate > Cockrell School of Engineering > Degrees and Programs > Minor and Certificate Programs

Humanitarian Engineering Certificate

The undergraduate certificate in Humanitarian Engineering provides students with the opportunity to develop expertise in designing and/or implementing projects or products for traditionally underserved populations, e.g., the physically or mentally challenged, low-income or rural communities. The participants will develop not only technical knowledge but also awareness of social, political, and/or economic circumstances that may be important to the development of engineering solutions for underserved populations.

The certificate consists of eighteen hours. Students must receive a grade of at least a C- in each course applied toward the certificate and have a cumulative grade point average of at least 3.0 in the courses presented to fulfill the certificate. The certificate program will be managed by the Committee for the Humanitarian Engineering Certificate in the Department of Mechanical Engineering. Students may apply for participation in the program at any time during their enrollment at the University of Texas, but it is recommended that they apply prior to starting the requirements. Students must contact the Committee for the Humanitarian Engineering Certificate in the Department of Mechanical Engineering to apply for the certificate in the semester in which they are completing the requirements and graduating.

The course requirements for the certificate are:

1. Choose one three credit hour lower division UGS or Social Science course from the following list

UGS302	Development of Moral Action
UGS302	Global Indigenous Cultures
UGS302	How to Change the World
UGS302	Humanitarian Aid Worker Story
UGS302	Language and Culture in Amazonia
UGS302	Marketing for Social Profit
UGS302	New World/Old World encounters
UGS302	Social Entrepreneurship
UGS302	Social Inequality/Educ Lat Amer
UGS302	Usability and user-centered design
UGS302	Diff Dialog: Visualizing Cuba
UGS302	Diff Dialog: Cultural Identities/differences
UGS302	Emerging markets
UGS302	Global Inequalities & Health
UGS302	Lat Amer Envir Hist/Sustainabl
UGS302	Middle East Today
UGS302	Our Global Backyard
SOC307N	Sociology of Development
ANT302	Cultural Anthropology
CTI302	Classics of Social and Political Thought
GRG305	This Human World: Intro to Geography

2. Four credit hours Engineering Physics and Lab: PHY 303L and PHY103N

3. Four credit hours humanitarian engineering project (choose one of the following)
 (a) Projects with Underserved Communities sequence:

ME279M	Project Development with Underserved Communities
ME279M	Project Design with Underserved Communities

- (b) Approved project in design course such as ME466K
 (c) Approved independent study research project

Approval for options (b) and (c) must be obtained in advance from the Committee for the Humanitarian Engineering Certificate.

4. One credit hour seminar course: ME179M Humanitarian Engineering Seminar
5. Three credit hours from the following list

GRG 344K	Global Food, Farming, and Hunger
GRG356	Water Resources: Lat American/Caribbean
SOC369K	Populations and Society
GRG 336	Contemp Cultural Geography
GRG 350K	Geographies of Globalization
GRG 357	Medical Geography
SOC 321G	Global Health Issues/Systems
CTI 323	Might and Right Among Nations
PHL 325C	Environmental Ethics
PHL 325M	Medicine, Ethics, and Society
ANS 372	Topic 26: Global Markets and Local Cultures
HIS 366N	Global History of Disease
ADV 378	Communicating sustainability
CMS340K	Communication and Social Change

6. Three credit hours from the following list

ARE 323K,	Project Management and Economics
ARE 346N	Building Environmental Systems
BME 344	Biomechanics
BME 342	Biomechanics of Human Movement
BME 358	Medical Decision Making
BME 339	Biochemical Engineering
BME 352	Advanced Engineering Biomaterials
CE 341	Introduction to Environmental Protection
CE 342	Water and Waste Water Treatment
CE 369R	Indoor Air Quality
CE 377K	Designing Sustainable Nanomaterials
CE 374K	Hydrology
CE 341	Introduction to Environmental

CE 342	Water and Waste Water Treatment
CE 364	Design of Wastewater and Water Treatment
CHE 339	Introduction to Biochemical Engineering
CHE 339T	Cell and Tissue Engineering
CHE 341	Design for the Environment
CHE 342	Chemical Engineering Economics and Business Analysis
CHE 357	Technology and the Impact on the Environment
EE 374K	Biomedical Electronic Instrument Design
EE 374L	Applications of Biomedical Engineering
EE 362R	Renewable Energy and Power Systems
EE 362S	Development of a Solar-Powered Vehicle
EE 339S	Solar Energy Conversion Devices
ME 379M	Energy Technology and Policy
ME 379M	Introduction to Renewable Energy Engineering and Sustainability
ME 337F	Nuclear Environmental Protection
ME 354M	Biomechanics of Human Movement
ME 374S	Solar Energy Systems Design
ME 379M	Clinical Cardiology
ME 379M	Design/Control of Robots for Rehabilitation (cancelled)
ME 379M	Medical Device Design and Manufacture
ME 379M	Nanotechnology for Sustainable Energy
ME 379M	Development of a Solar-Powered Vehicle
PGE 305	Energy and the Environment

Additional courses may be substituted for those listed upon approval by the Advisor for Humanitarian Engineering.