November 4, 2015

Dr. Steven Leslie
Executive Vice Chancellor for Academic Affairs
The University of Texas System
OHH 304 (P4300)

Dear Dr. Leslie:

Enclosed for your approval is the proposal to add an Environmental Engineering Degree Program in the Cockrell School of Engineering chapter of the Undergraduate Catalog 2016-2018 (D 13173-13180). The proposal was classified as being of general interest to more than one college or school and was approved unanimously by the Faculty Council on September 21, 2015. The proposal has undergone a 30-day review period, by public institutions within 50 miles of The University of Texas at Austin, with no objections. The authority to grant final approval on these changes resides with Texas Higher Education Coordinating Board.

Sincerely,

Judith H. Langlois
Executive Vice President and Provost, ad interim

cc:
Gregory L. Fenves, President of the University

cc:
Hillary Hart, Secretary, Office of the General Faculty
Carol Longoria, Assistant Deputy to the President
Gerald Speitel, Associate Dean for Academic Affairs, Cockrell School
Brenda Schumann, Associate Registrar
Linda Dickens, Sr. Director, Institutional Accreditation and Effectiveness
Cynthia Cruz, Administrative Manager, Provost's Office
IRRIS Team
Suzanne Revisore, Assistant to the EVCAA, UT System
Debbie Roberts, Executive Assistant, Office of the General Faculty
Victoria Cervantes, Sr. Administrative Associate, Office of the General Faculty
September 29, 2015

Judith H. Langlois  
Interim Executive Vice President and Provost  
The University of Texas at Austin  
MAI 201  
Campus Mail Code: G1000

Dear Dr. Langlois:

Enclosed for your consideration and action is a proposal to add an Environmental Engineering Degree Program in the Cockrell School of Engineering chapter in the Undergraduate Catalog, 2016-18 (D 13173-13180). On September 21, 2015, the Faculty Council unanimously approved the legislation. The proposal was classified as being of general application and of primary interest more than one college or school. The authority to grant final approval resides with the Texas Higher Education Coordinating Board.

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

Sincerely,

Hillary Hart, Secretary  
General Faculty and Faculty Council

HH: dr

Enclosure

xc: Gregory L. Fenves, president  
Carol Longoria, deputy to the president  
Janet Dukerich, senior vice provost for faculty affairs

c (letter only): Sharon L. Wood, dean, Cockrell School of Engineering  
Gerald Speitel, associate dean for academic affairs, Cockrell School of Engineering  
Deana Sutliff, manager of reporting and analysis, IRRIS  
Allen Walser, manager of reporting and analysis, IRRIS  
Brenda Schumann, associate registrar  
Lydia Cornell, Program Coordinator  
Michelle George, administrative manager for faculty affairs, provost’s office
DOCUMENTS OF THE GENERAL FACULTY

PROPOSAL TO ADD AN ENVIRONMENTAL ENGINEERING DEGREE PROGRAM IN THE COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE UNDERGRADUATE CATALOG, 2016-2018

Dean Sharon L. Wood in the Cockrell School of Engineering has filed with the secretary of the Faculty Council the following changes to the Undergraduate Catalog, 2016-2018. On January 24, 2014, the Department of Civil, Architectural, and Environmental Engineering approved the proposal. On February 25, 2015, the dean and the faculty in college approved the proposal. 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 new degree program on May 13, 2015, and forwarded the proposal 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 Texas Higher Education Coordinating Board.

The Faculty Council will discuss and take action on the proposal at its meeting on September 21, 2015.

Hillary Hart, Secretary
General Faculty and Faculty Council

Posted on the Faculty Council website (http://www.utexas.edu/faculty/council/) on September 4, 2015.
PROPOSAL TO ADD AN ENVIRONMENTAL ENGINEERING DEGREE PROGRAM IN THE COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE UNDERGRADUATE CATALOG, 2016-2018

Type of Change
☐ Academic Change
☒ Degree Program Change (THECB form required)

Proposed classification
☐ Exclusive ☒ General ☐ Major

1. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT LINDA DICKENS, DIRECTOR OF ACCREDITATION AND ASSESSMENT, TO DETERMINE IF SACS-COC APPROVAL IS REQUIRED.
   • Is this a new degree program? ☒ Yes ☐ No ☐
   • Does the program offer courses that will be taught off campus? ☐ Yes ☐ No ☒
   • Will courses in this program be delivered electronically? ☐ Yes ☐ No ☒

2. EXPLAIN CHANGE TO DEGREE PROGRAM AND GIVE A DETAILED RATIONALE FOR EACH INDIVIDUAL CHANGE:

This is a new degree program. The curriculum has been put together to satisfy all requirements of the Texas Higher Education Coordinating Board (THECB), the University of Texas at Austin core curriculum, and the Accreditation Board for Engineering and Technology (ABET) for an environmental engineering degree.

The curriculum is presented and explained in detail in the THECB form and under the proposed new catalog text heading below.

3. THIS PROPOSAL INVOLVES (Please check all that apply)
   ☒ Courses in other colleges
   □ Courses in proposer’s college that are frequently taken by students in other colleges
   ☒ Flags
   □ Course in the core curriculum
   □ Change in course sequencing for an existing program
   □ Change in admission requirements (external or internal)
   ☒ Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office)
   □ Courses that have to be added to the inventory

4. SCOPE OF PROPOSED CHANGE
   a. Does this proposal impact other colleges/schools? ☒ Yes ☐ No ☐
      If yes, then how? These students will take classes in CNS; the chemistry and biology requirements are greater in this curriculum than in the current civil engineering curriculum. The students will also take a geology class, but this requirement is the same as in the civil engineering curriculum. Most students choose GEO 303 as their required science elective. So there will be minimal impact unless the total enrollment in the two degree programs rises.
   b. Do you anticipate a net change in the number of students in your college? ☐ Yes ☐ No ☒
      If yes, how many more (or fewer) students do you expect?
   c. Do you anticipate a net increase (or decrease) in the number of students from outside of your college taking classes in your college? ☐ Yes ☐ No ☒
      If yes, please indicate the number of students and/or class seats involved.
   d. Do you anticipate a net increase (or decrease) in the number of students in your college taking courses in other colleges? ☐ Yes ☐ No ☒
If yes, please indicate the number of students and/or class seats involved. Fifty students in BIO 311C and CH 204; in GEO 303, since most CE students take this course as a required science elective, the impact will be approximately ten students.

If 4a, b, c, or d was answered with yes, please answer the following questions. If the proposal has potential budgetary impacts for another college/school, such as requiring new sections or a non-negligible increase in the number of seats offered, at least one contact must be at the college-level.

How many students do you expect to be impacted? Fifty students per year: the Cockrell School of Engineering has admission limits for each of its undergraduate degree programs, as well as an overall limit on the total number of undergraduates enrolled. The admission limit for environmental engineering will be fifty students per year, which will be achieved by reducing the civil engineering admission limit by fifty per year, thereby yielding no net change in the total number of undergraduates enrolled in the Cockrell School of Engineering.

These students will take classes in CNS; the chemistry and biology requirements are greater in this curriculum than in the current civil engineering curriculum. The students will also take a geology class, but most CE students take this course as a required science elective, so there will be minimal impact unless the total enrollment in the two degree programs rises.

Impacted schools must be contacted and their response(s) included: College of Natural Sciences
Person communicated with: Sacha Kopp, associate dean
Date of communication: February 14, 2014
Response: Okayed the BIO 311C, CH 204, and CH 328 increases.
Person communicated with: David Vandenbout, associate dean
Date of communication: April 15, 2015
Response: Approved the Ch 353 and additional math and physics courses

Impacted schools must be contacted and their response(s) included: Jackson School & Dept of Geology
Person communicated with: Richard Ketcham, Assoc. Dean, and Ron Steel, Chair of Geology
Date of communication: April 30, 2014
Response: Okayed increases in GEO 303 (or 401 for a few students)

e. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? NO. If yes, explain:
   If yes, undergraduate studies must be informed of the proposed changes and their response included:
   Person communicated with:
   Date of communication:
   Response:

f. Will this proposal change the number of hours required for degree completion? If yes, explain:
   This is a new degree program, with required credit hours at the minimum of all of the engineering programs at UT Austin

5. COLLEGE/SCHOOL APPROVAL PROCESS
   Department approval date: January 24, 2014
   College approval date: February 25, 2014
   Dean approval date: February 25, 2014
PROPOSED NEW CATALOG TEXT:

Bachelor of Science in Environmental Engineering

Environmental Engineers protect the natural environment and the health of people as influenced by the environment. The field began as a part of civil engineering by providing the water supply for municipalities but has grown to encompass a broad view of the interaction of humans with the environment. The environmental engineer applies principles from all of the natural sciences (physics, chemistry, geology, and biology) to understand the natural environment and to build systems that protect that environment. Areas of environmental engineering include air quality, water quality, water resources, and contaminant process engineering.

The environmental engineering student obtains a broad background in mathematics and all the sciences, along with their application to the several areas of environmental engineering. This flexible curriculum allows the student to elect eighteen semester hours of approved technical coursework to emphasize the areas of environmental engineering of most interest to the student. In addition, courses in the humanities and social sciences are included.

To excel as an environmental engineer, a student should have an aptitude for mathematics and science, an abiding interest in protecting the natural environment and public health, and the motivation to study and prepare for environmental engineering practice. Environmental engineering graduates of the University may seek a wide variety of employment opportunities with private consulting firms, industry, and government agencies at the local, state, and national levels. Those who plan to pursue graduate work in engineering, or in other professions such as business, medicine, law, or journalism, have an excellent base on which to build.

Student Outcomes

Graduates of the environmental engineering program should attain the following outcomes:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- An ability to function on multidisciplinary teams
- An ability to identify, formulate, and solve engineering problems
- An understanding of professional and ethical responsibility
- An ability to communicate effectively
- The broad education necessary to understand what impact engineering solutions have in global, economic, environmental, and societal contexts
- Recognition of the need for and an ability to engage in lifelong learning
- Knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Program Educational Objectives

Graduates of the environmental engineering program should address environmental engineering problems within a greater societal context. They should:

- Act professionally and ethically
- Apply knowledge, strong reasoning, and quantitative skills to design and implement creative and sustainable solutions
- Engage in lifelong learning to meet the challenges facing the profession
- Exhibit strong communication, interpersonal, and resource-management skills as leaders in the environmental engineering profession
Portable Computing Devices

- Students entering Environmental Engineering are required to have a laptop at their disposal. Laptops do not need to be brought to campus on a daily basis, but individual courses may require that a laptop be brought to class or laboratory sessions. For a list of minimum system requirements see: www.caee.utexas.edu/students/fiss.

Curriculum

Each student must complete the University's core curriculum. In some cases, a course required for the Bachelor of Science in Environmental Engineering may also be counted toward the core curriculum; these courses are identified below. To ensure that courses used to fulfill the social and behavioral sciences and visual and performing arts requirements of the core curriculum also meet ABET criteria, students should follow the guidance given in ABET Criteria.

In the process of fulfilling engineering degree requirements, students must also complete coursework to satisfy the following flag requirements: one independent inquiry flag, one quantitative reasoning flag, one ethics and leadership flag, one global cultures flag, one cultural diversity in the US flag, and two writing flags. The independent inquiry flag, the quantitative reasoning flag, the ethics and leadership flag, and one writing flag are carried by courses specifically required for the degree; these courses are identified below. Students are advised to fulfill the flag requirements with a course that meets other requirements of the degree. Courses that may be used to fulfill flag requirements are identified in the Course Schedule.

Math, science and engineering electives are chosen from a list of approved courses maintained in the undergraduate office.

Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Environmental Engineering</td>
<td></td>
</tr>
<tr>
<td>EVE 3XX Introduction to Environmental Engineering</td>
<td>3</td>
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<tr>
<td>EVE 3YY Sustainable Systems Engineering</td>
<td>2</td>
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<tr>
<td>EVE 3ZZ Environmental Engineering and Science</td>
<td>3</td>
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<tr>
<td>Approved environmental engineering elective</td>
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<tr>
<td>Approved environmental engineering design elective</td>
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<tr>
<td>Architectural Engineering</td>
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<tr>
<td>ARE 323K Project Management and Economics Biology</td>
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<tr>
<td>Biology</td>
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<td>BIO 311C Introduction to Biology I</td>
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<tr>
<td>Chemistry</td>
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<tr>
<td>CH 301 Principles of Chemistry I (part I science and technology)</td>
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<tr>
<td>CH 302 Principles of Chemistry II (part I science and technology)</td>
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<tr>
<td>CH 204 Introduction to Chemical Practice</td>
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<tr>
<td>CH 328M Organic Chemistry</td>
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<td>Civil Engineering</td>
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<td>CE 311K Introduction to Computer Methods</td>
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<tr>
<td>CE 311S Probability and Statistics for Civil Engineers</td>
<td>3</td>
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<tr>
<td>CE 319F Elementary Mechanics of Fluids</td>
<td>3</td>
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<tr>
<td>CE 333T Engineering Communication (writing flag and ethics and leadership flag)</td>
<td>3</td>
</tr>
<tr>
<td>CE 356 Elements of Hydraulic Engineering</td>
<td>3</td>
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<tr>
<td>Engineering Mechanics</td>
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</table>
E M 306  Statics  3
Geology
GEO 303  Introduction to Geology  3
Mathematics
M 408C  Differential and Integral Calculus (mathematics; quantitative reasoning flag)  4
M 408D  Sequences, Series, and Multivariable Calculus  4
M 427J or M 427K  Differential Equations with Linear Algebra or Advanced Calculus for Applications I (quantitative reasoning flag)  4
Physics
PHY 303K  Engineering Physics I (part II science and technology; quantitative reasoning flag)  3
PHY 303L  Engineering Physics II  3
PHY 103M  Laboratory for Physics 303K  1
PHY 103N  Laboratory for Physics 303L  1
Rhetoric and Writing
RHE 306  Rhetoric and Writing (English composition)  3
Other Required Courses
M E 320  Applied Thermodynamics  3
or M E 326  Thermodynamics  3
or CH 353  Physical Chemistry I  3
Approved mathematics or science elective  3
Approved engineering elective  6
Remaining Core Curriculum Courses
UGS 302  First-Year Signature Course (writing flag)  3
or UGS 303  First-Year Signature Course (some sections carry a writing flag)  3
E 316L  British Literature (humanities) (some sections carry a global cultures flag)  3
or E 316M  American Literature (some sections carry a global cultures flag)  3
or E 316N  World Literature (some sections carry a global cultures flag)  3
or E 316P  Masterworks of Literature  3
American and Texas government (some sections carry a global cultures and/or cultural diversity flag)  6
American history (some sections carry a cultural diversity flag)  6
Social and behavioral science (some sections carry a global cultures and/or cultural diversity flag)  3
Visual and performing arts (some sections carry a global cultures and/or cultural diversity flag)  3
Total Hours 124

Technical Electives

Technical electives in environmental engineering are listed in four areas of specialization below. Six semester credit hours must be selected from one of the technical areas along with an approved environmental engineering design elective. The remaining environmental engineering electives can be taken from any area or combination of areas. Courses not listed can be approved by the undergraduate advisor.

Area 1, Air, Climate and Energy
Architectural Engineering 346N, Building Environmental Systems
Architectural Engineering 346P, HVAC Design
Architectural Engineering 370, Design of Energy Efficient and Healthy Buildings
Architectural Engineering 371, Energy Simulation in Building Design
Architectural Engineering 372, Modeling of Air and Pollutant Flows in Buildings
Architectural Engineering 377, Climate Change Mitigation
Chemical Engineering 379, Atmospheric Physicochemical Processes
Civil Engineering 369L, Air Pollution Engineering
Civil Engineering 369R, Indoor Air Quality

**Area 2. Sustainable Water Systems**
Civil Engineering 342, Water and Wastewater Treatment Engineering
Civil Engineering 346, Solid Waste Engineering and Management
Civil Engineering 370L, Water Pollution Chemistry

**Area 3. Water Resources and the Environment**
Civil Engineering 374K, Hydrology
Civil Engineering 374L, Groundwater Hydraulics
Civil Engineering 357, Geotechnical Engineering
Civil Engineering 358, Introductory Ocean Engineering

**Area 4. Contaminant Fate and Transport**
Civil Engineering 342, Water and Wastewater Treatment Engineering
Chemical Engineering 322, Thermodynamics
Chemical Engineering 353, Transport Phenomena
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<tr>
<th>First year: Fall</th>
<th>First year: Spring</th>
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<tbody>
<tr>
<td>4 M 408C</td>
<td>M 408D</td>
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<tr>
<td>3 CH 301</td>
<td>CH 302</td>
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<tr>
<td>3 BIO 311C</td>
<td>CH 204</td>
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<td>3 RHE 306</td>
<td>EVE 3xx</td>
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<tr>
<td>3 UGS 302 (or UGS 303)</td>
<td>PHY 303K</td>
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<td>16</td>
<td>PHY 103M</td>
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<td>Laboratory for PHY 303K</td>
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<td>CH 328M</td>
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<tr>
<td>3 PHY 303L</td>
<td>CE 319F</td>
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<td>1 PHY 103N</td>
<td>CE 311K</td>
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<td>3 EM 306</td>
<td>CE 333T</td>
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<td>3 GOV</td>
<td>Environmental &amp; Culture</td>
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<td>3 ME 320 or ME 326 or CH 353</td>
<td>GEO 303</td>
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<tr>
<td>3 CE 311S</td>
<td>Introduction to Geology</td>
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<tr>
<td>3 CE 356</td>
<td>Environmental Engineering Elective</td>
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<td>3 GOV</td>
<td>Environmental Engineering Elective</td>
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<td>15</td>
<td>American History</td>
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<td>Humanities Core Course</td>
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<td>3 ARE 323K</td>
<td>Engineering Elective</td>
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<td>3 ARE 323K</td>
<td>Visual &amp; Performing Arts</td>
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<td>Core Course</td>
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- Differential & Integral Calculus
- Principles of Chemistry I
- Introduction to Biology I
- Rhetoric and Composition
- First-year Signature Course
- Differential Equations with Linear Algebra
- Engineering Physics II
- Laboratory for PHY 303L
- Statics
- Sustainable Systems Engineering
- American Government
- Thermodynamics/Physical Chemistry
- Probability & Statistics for Civil Engineers
- Elements of Hydraulic Engineering
- Environmental Engineering Elective
- American Government
- Project Management & Economics
- Environmental Engineering Elective
- Environmental Engineering Elective
- Social and Behavioral Science Core Course
- Mathematics or Science Elective
- Sequences, Series, & Multivariable Calculus
- Principles of Chemistry II
- Intro to Chemical Practice
- Intro to Environmental Engineering
- Engineering Physics I
- Laboratory for PHY 303K
- Organic Chemistry
- Fluid Mechanics
- Intro to Computer Methods
- Engineering Communication
- Environmental Engineering & Science
- Introduction to Geology
- Environmental Engineering Elective
- Environmental Engineering Elective
- American History
- Humanities Core Course