

New Program Code **Modify Program Code**

Date: 5/31/2019

REQUESTOR CONTACT INFORMATION

Name Stuart Lau Campus Mānoa, UH
 Title Registrar Email stuartl@hawaii.edu
 Office/Dept Office of the Registrar Phone 956-5322

NEW PROGRAM CODE TO CREATE

Institution MAN - University of Hawaii at Manoa Campus MAN - University of Hawaii at Manoa
 Level UG - Undergraduate Effective Term _____

	Code (Max. Characters)	Description	Check if requesting new code:
College	(2) <u>40</u>	<u>College of Engineering</u>	<input type="checkbox"/> See Banner form STVCOLL
Department	(4) <u>CEE</u>	<u>Civil & Environmental Engr</u>	<input type="checkbox"/> See Banner form STVDEPT
Degree/Certificate	(6) <u>BS</u>	<u>Bachelor of Science</u>	<input type="checkbox"/> See Banner form STVDEGC
Major	(4) <u>CNST</u>	<u>Construction Engineering</u>	<input checked="" type="checkbox"/> See Banner form STVMAJR
Concentration	(4) _____	_____	<input type="checkbox"/> See Banner form STVMAJR
Minor	(4) _____	_____	<input type="checkbox"/> See Banner form STVMAJR
If a similar major/concentration code exists in Banner, please list the code:			<input type="checkbox"/> CEM

Justification to warrant a new major/concentration code similar to an existing major/concentration code:

The description for CEM should be changed to reflect the name of the program, "Construction, Engr & Mgmt".

I do not believe the code is being used by any program other than CEM-GCERT in the system.

Is this major/concentration code being used the same way at the other UH campuses? Yes No
 Should this program be available for applicants to select as their planned course of study on the online application? *If yes, student may select the code as their only program of study.* Yes No

RULES PERTAINING TO FINANCIAL AID AND 150% DIRECT SUBSIDIZED LOAN LIMIT LEGISLATION

Is 50% or greater of the classes in this program offered at a location other than the Home Campus? Yes No

Is this program/major/certificate financial aid eligible? Yes No

Does this certificate qualify as a Gainful Employment Program (Title IV-eligible certificate program)? Yes No

See <http://www.ifap.ed.gov/GainfulEmploymentInfo/index.html>

Program Length

In academic years; decimals are acceptable. The length of the program should match what is published by the campus in any online and/or written publication.

4 years

Special Program Designations

See *Special Program Designations Code Definitions on IRAO Program Code Request webpage*

A B N P T U

Required Terms of Enrollment: Fall Spring Summer Extended

IRAO USE ONLY: DATE RECEIVED



UNIVERSITY of HAWAII
MĀNOA

UNIVERSITY OF HAWAII
BOARD OF REGENTS

19 MAR -7 09:34
MEMORANDUM

DTS-19-110-1
APPROVED
3/28/19
DATE
2019
RECEIVED
BOARD SECRETARY
UNIVERSITY OF HAWAII
BOARD OF REGENTS

TO: Lee Putnam, Chair
Board of Regents

VIA: David Lassner
President *David Lassner*

VIA: Donald Straney
Vice President for Academic Policy and Planning *Donald Straney*

VIA: David Lassner
Interim Chancellor *David Lassner*

FROM: Michael Bruno
Interim Vice Chancellor for Academic Affairs
and Vice Chancellor for Research *Michael Bruno*

SUBJECT: APPROVAL OF NEW BACHELOR OF SCIENCE IN CONSTRUCTION
ENGINEERING BY THE DEPARTMENT OF CIVIL AND
ENVIRONMENTAL ENGINEERING AT UH-MĀNOA

SPECIFIC ACTION REQUESTED:

It is respectfully requested that the Board of Regents approve as provisional the Bachelor of Science in Construction Engineering to be offered by the Department of Civil and Environmental Engineering in addition to their long standing Bachelor of Science in Civil Engineering.

RECOMMENDED EFFECTIVE DATE:

Effective Fall 2019

ADDITIONAL COST:

The proposed program will require additional nominal resources (lecturers) necessitated by the addition of two new courses per year. The addition of one faculty member to accommodate the expected increase in majors is proposed for year 2021 through retirements or reallocations.

PURPOSE:

The Bachelor of Science in Construction Engineering will allow students to follow a more specialized degree than the current civil engineering degree. Due to accreditation requirements, the civil engineering degree requires coverage of at least four technical areas, currently among construction, environmental, geotechnical, hydrology and hydraulics, structures, and traffic and transportation. However, about one half of our

graduates are engaged in construction related engineering activities, but they are not well-prepared through the existing civil engineering degree, which is more design-oriented. Specifically, with the civil engineering bachelor's degree, our graduates take nine (9) credits in construction courses, but with the construction engineering bachelor's degree, the students will be able to take up to 24 credits in construction courses, making them much better prepared to work in construction engineering tasks and projects. ABET accreditation for the new degree will be sought during the next general accreditation review in 2021.

BACKGROUND:

Pursuant to Board of Regents Policy 5.201: Instructional Programs, "The Board shall approve the establishment of all new instructional programs granting academic credit leading to a degree or credential, upon recommendation by the President."

The UHM College of Engineering offers ABET-accredited undergraduate degrees in Computer Engineering, Civil Engineering, Electrical Engineering, and Mechanical Engineering. The College is also offering a new undergraduate degree in Engineering Science, which will seek accreditation in 2021. The College also offers the MS and PhD in Civil Engineering, Electrical Engineering, and Mechanical Engineering.

The proposed program is consistent with the Integrated Academic and Facilities Plan for the University of Hawai'i System, approved by the Board of Regents on April 20, 2017. This program will help UH attract more high school students locally and nationally. The local and national need for this degree is strong and Construction Engineering will allow students to study more in this popular area of interest, and let them graduate from an ABET-accredited program. As an additional opportunity for students to pursue an engineering degree, this program will also help retention and persistence of enrolled students. Engineering has already established pathways with the UH community colleges for transferring students. This new program will help strengthen the pathways and create more opportunities for students from UH community colleges.

A Construction Engineering program will prepare students for engineering and management positions in the construction industry by providing them with the educational tools they need. The curriculum will provide a solid foundation on which graduates will build their careers in the construction industry. Using the latest technology, students learn how the industry operates, what is expected of them as construction engineers and managers, and how to complete projects safely, on-time, and within budget. Hands-on project experiences coupled with theory-based instruction prepares students to become well-rounded professionals.

The demand for a program specifically designed for Construction Engineering is high given that many graduates of UHM's CEE program take positions in construction companies. We anticipate that after the program is established there will be approximately 50 graduates per year.

The University of Hawai'i at Mānoa is the only campus in Hawai'i that confers degrees in accredited engineering programs. Engineering is critical to the continued development of Hawai'i's economy. In addition, for several decades the Department of Civil and Environmental Engineering has had close ties with the construction industry and the General Contractors Association of Hawai'i. For example, Mr. William (Bill) Wilson, past President of Hawaiian Dredging and Construction, is a past member of the CEE Industry Advisory Committee and current member on the Dean's Council, College of Engineering. Mr. Russell Young, President, Albert C. Kobayashi, Contractors is currently a member of the Industry Advisory Committee of the Civil Engineering Department.

There is no additional admission policy to the Construction Engineering program other than that of admission or transfer to the College of Engineering and the University of Hawai'i at Mānoa. It is envisioned that students who will enroll in the program will include existing engineering students and new students. With the proposed degree program in place, we will be able to attract the students who would otherwise go to the mainland to obtain a Construction Engineering degree.

The Department has been offering a suite of six (6) Construction Engineering courses for over 30 years, but because of other requirements civil engineering degree students can take only a maximum of three of them. Two more courses, one in construction law and another in construction safety are planned to be added to be fully compliant with accreditation requirements. We are collaborating with the School of Law to offer the former, and with professionals with many years of construction experience to offer the latter course. In addition, we have partnered with the Shidler College of Business for the students to take one of their accounting courses.

The UH-Mānoa campus is constantly undergoing construction projects (addition, repair, renovation, etc.) and will provide convenient opportunities for hands-on experience and case study analysis in addition to internships offered to our students by the local construction industry.

Both the curriculum and accreditation process are similar to the existing degree in civil engineering, with students in both majors taking a majority of the same courses. Therefore, there is no difficulty in launching the new Bachelor program immediately upon BOR approval.

The CEE Department already has an Industry Advisory Committee which is made up of 16 representatives from industry including the construction industry. The IAC meets with the department twice annually and reviews the program including laboratory tours, and meetings with students and faculty members; the same IAC will have oversight for the Construction Engineering program.

Lee Putnam
March 4, 2019
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ACTION RECOMMENDED:

It is recommended that the Board of Regents approve as provisional the Bachelor of Science in Construction Engineering in the Department of Civil Engineering at UH-Mānoa.

Attachment: Proposal for BS in Construction Engineering

**cc: Executive Administrator and Secretary of the Board Kendra Oishi
Interim Dean H. Ronald Riggs**

Bachelor of Science in Construction Engineering

1. Program Purpose and Outcomes

A. Purpose

The BS in Construction Engineering will allow students to follow a more specialized degree than the current civil engineering degree in the College of Engineering (CoE). Due to accreditation requirements, the civil engineering degree requires we prepare graduates in four technical areas appropriate to civil engineering, which include construction, environmental, geotechnical, hydrology and hydraulics, structures, and traffic and transportation. Construction engineering is less focused on mathematical solutions and design of projects; it is more focused on the processes of material and supply flows, scheduling, crew management, site compliance and safety, etc. ABET, the engineering accreditation organization, recognizes 28 different programs (including Construction Engineering); the College currently has only 4. This approach will allow us to expand our offerings by one degree that is in high demand in Hawaii and the nation as both go through a necessary infrastructure rehabilitation, renewal and expansion.

Major new construction projects on Oahu include new terminals at the airport, secondary sewage treatment plants both at Sand Island and Honouliuli, hundreds of water and sewer line replacements, thousands of lane miles of road repairs, the new Atlantis hotel in Ko'Olina, and a large number of new buildings and large building renovations, both private and public. Most old bridges and dams are at risk and functionally obsolete on the neighboring islands, requiring substantial construction work to bring them to current standards. The April 2018 storms on Kauai are likely to generate about \$200 million worth of construction and the threat of storm damage and recovery through re-construction is ever present in Hawaii. This makes Civil Engineering and Construction Engineering two of the most necessary types of expertise for the State.

B. Identify the program outcomes, what the student will know and be able to do at the completion of the program

Engineering accreditation by ABET requires all programs to have the following student outcomes and to assess rigorously the achievement of the following outcomes centered on graduates having the ability to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic,

environmental, and societal contexts.

5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

The above outcomes establish what the student will know and be able to do at the completion of the program.

C. Describe the fit of the proposed program with system/campus mission and state need. Describe how the program addresses the following:

1) Aligns with the UH System mission and academic master plan and the campus mission and academic plan

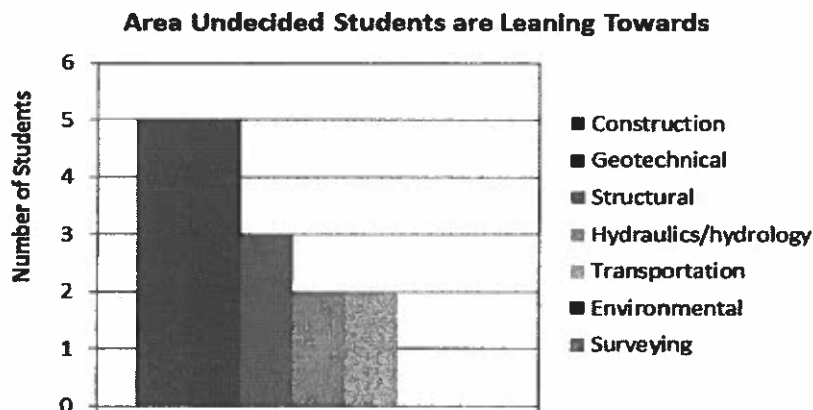
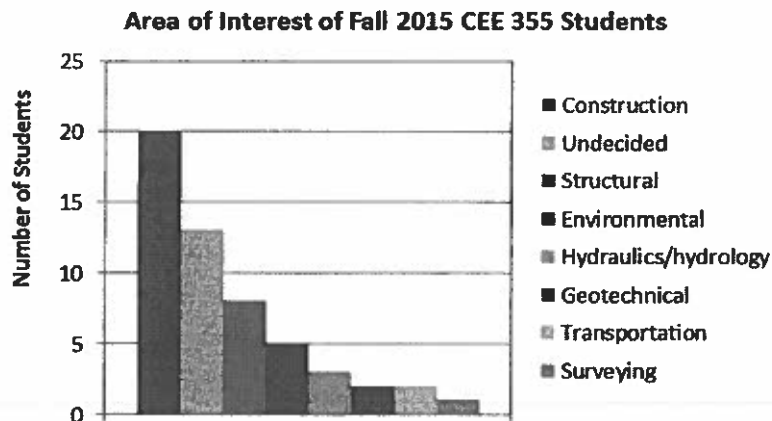
The proposed program is consistent with the Integrated Academic and Facilities Plan for the University of Hawaii' System, approved by the Board of Regents on April 20, 2017. This program will help UH attract more high school students locally and nationally. The local and national need for this degree is strong and Construction Engineering will allow students to study more in this popular area of interest, and let them graduate from an ABET-accredited program. As an additional opportunity for students to pursue an engineering degree, this program will also help retention and persistence of enrolled students. Engineering has already established pathways with UH community colleges for transferring students. This new program will help strengthen the pathways and create more opportunities for students from UH community colleges.

2) Provides evidence of continuing need for the program, projections of the number of graduates, of career and graduate education opportunities for those completing the proposed program, etc.

Society is becoming ever more technological, and the need for engineers is increasing. The need increases as the baby-boom generation retires. Construction Engineering is a well-defined engineering specialty.

Approximately 40%¹ of Civil Engineering graduates have found employment with local and mainland contractors. Also, in a 2015 internal poll of 54 CEE junior and senior students, 37% (20 out of 54) students showed an interest in specializing in Construction; and out of the 13 undecided students, 5 or 38% favored Construction Engineering.

¹ Based on information from "May 2016 State Occupational Employment and Wage Estimates Hawaii" of the US Bureau of Labor Statistics, https://www.bls.gov/OES/current/oes_hi.htm#17-0000.



A similar survey conducted in 2008 among 116 CEE students showed 46% (53 out of 116) expressed an interest in pursuing Construction Engineering if the program is offered.

A Construction Engineering program will prepare students for engineering and management positions in the construction industry by providing them with the educational tools they need. The curriculum will provide a solid foundation on which graduates will build their careers in the construction industry. Using the latest technology, students learn how the industry operates, what is expected of them as construction engineers and managers, and how to complete projects safely, on-time, and within budget. Hands-on project experiences coupled with theory-based instruction prepares students to become well-rounded professionals.

The demand for a program specifically designed for Construction Engineering is high given that many graduates of UHM’s CEE program take positions in construction companies. We anticipate that once the program is established there will be approximately 50 graduates per year.

3) Includes a market analysis of the need of the program by addressing the professional, economic, social and workforce needs of the State of Hawai’i

Construction Engineering is a well-established discipline of the American Society of Civil Engineers (ASCE). A small sample is indicated by a section of the monthly email of popular

technical papers in the area of Construction Engineering, shown below.

Top Downloaded Articles in Construction Engineering

Mechanical Properties of Alkali-Activated Concrete Subjected to Impact Load

Journal of Materials in Civil Engineering

Structural Risk Allocation in U.S. Public-Private Partnership Highway Project Contracts

Journal of Construction Engineering and Management

Behavior of GFRP-RC Slab-Column Edge Connections with High-Strength Concrete and Shear Reinforcement

Journal of Composites for Construction

Financial-Based Incentive Plan to Reduce Construction Waste

Journal of Construction Engineering and Management

Comparison of an Emerging Seat of Arbitration and Leading Arbitration Seats and Recommendations for Reform

Journal of Legal Affairs and Dispute Resolution in Engineering and Construction

UHERO's latest forecast for Hawaii addressed construction as follows:²

"The construction cycle peaked in mid 2016, but the volume of activity has remained nearly as strong since then. In addition to resort and retail oriented developments around the state, two large-scale residential projects in Central Oahu and several high-rises in urban Honolulu will support construction activity at roughly its current level for the next several years."

In May 2015, the CEE Chair sent a Survey Monkey poll to the 95 CEE graduates in fall 2014 and spring 2015; 41 of them responded to the questionnaire and 30 answered the question of the name and location of their employment, as shown in the table below (these are the direct responses of students and some contain spelling errors.) The poll did not explicitly ask whether their job was in construction engineering, but we have a clear idea of how much construction each of the stated companies and agencies conduct as part of their engineering work. The data suggest that 54% of the Civil Engineering graduates work as Construction Engineers. Thirty respondents also revealed their starting salary which came to an average offer of \$58,000.

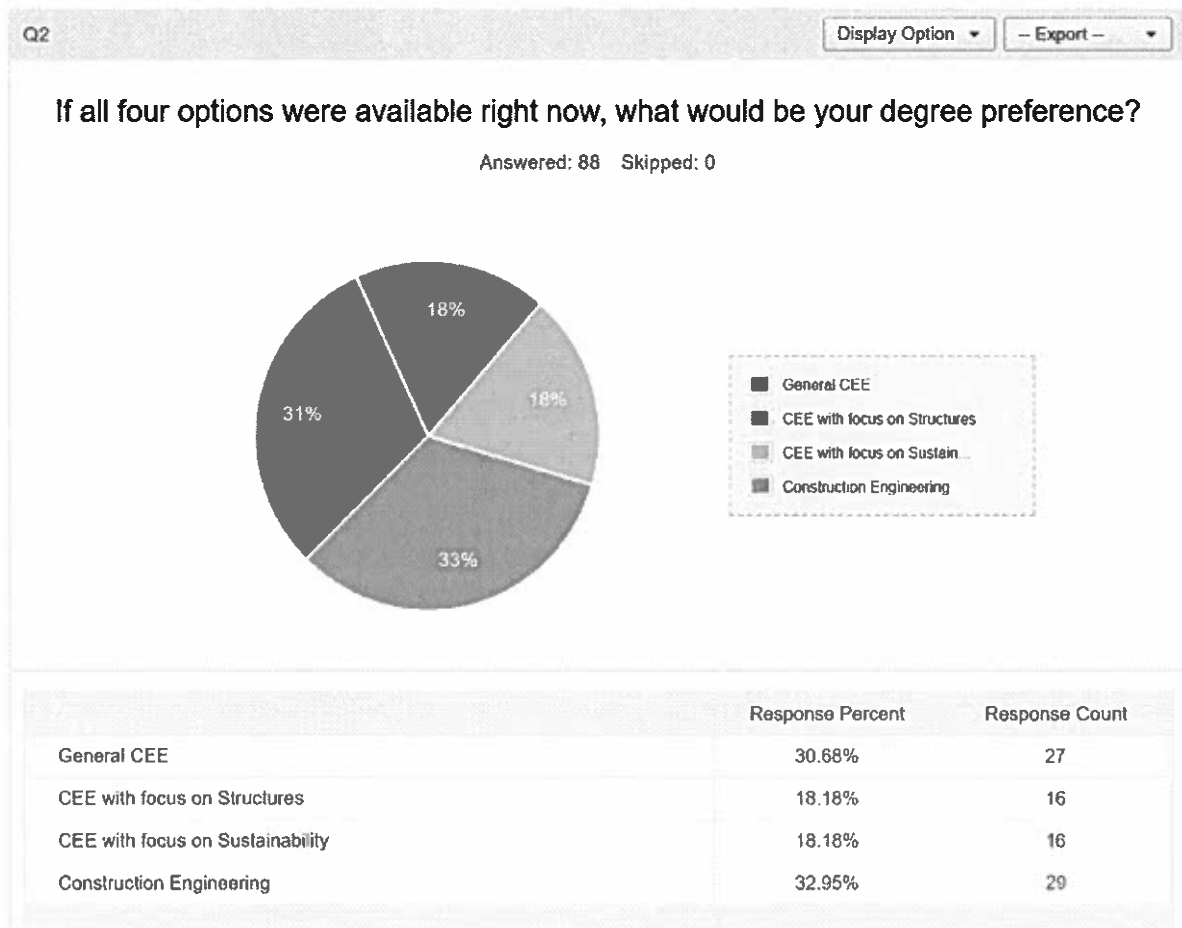
² UHERO, Annual Hawaii Forecast with Asia-Pacific Outlook, December 15, 2017.

	Employer and Location	Construction
1	Akinaka & Associates, Ltd. Located by the airport	1
2	Akinaka and Associates. Airport	1
3	Albert C. Kobayashi at a job site in Waikiki	1
4	BMK Construction, Lanai	0.9
5	City & County, Pearl City	0.3
6	DoD, Pearl Harbor Naval Shipyard	0.3
7	Englekirk, Downtown Honolulu	0
8	Environet Inc. in downtown Honolulu	0
9	Gray, Hong, Nojima & Associates, Inc. downtown Honolulu	0.1
10	Hawaii Engineering Group, Inc. located in downtown Honolulu	0
11	Hawaiian Dredging Construction Company, Inc, Honolulu, HI	0.9
12	Hawaiian Dredging; located in honolulu	0.9
13	HDCC AMCEE job site	1
14	Healy Tibbits	0.8
15	Hensel Phelps Con. Hawaii	0.9
16	Hensel Phelps Construction Co	0.9
17	Hensel Phelps, Honolulu	0.9
18	ICx Transportation Group	0
19	Johnson Controls in Honolulu	0.3
20	Kiewit, waipahu	1
21	Nan Inc	0.8
22	Nordic PCL	0.9
23	Nordic PCL Construction, Inc. / Four Seasons Ko Olina Renov.	1
24	Parsons, Hawaii	0.2
25	Pearl Harbor naval shipyard	0.3
26	Pearl harbor Naval Shipyard	0.3
27	Pearl Harbor Shipyard	0.3
28	R. M. Towill Corporation, Honolulu, HI	0.3
29	San Francisco Public Utilities Commission	0
30	Wilson Okamoto Corporation	0
	% Construction related jobs of Sp'15 UHM CEE graduates	54%

Last but not least, the CEE Chair conducted another poll in May 2018 as part of the CEE department's decision to establish a senior year track with a focus on sustainability. The survey asked current civil engineering students to make one choice out of four areas of focus, i.e. General Civil Engineering, Structures, Sustainability, Construction Engineering; see Question 2 on the next page. Construction Engineering was selected by 33% of the current CEE student undergraduate respondents.

All the above are major indications of strong demand. It should also be noted that the department's Industry Advisory Committee (CEE IAC) which consists of high-level professionals in the civil engineering and construction industry voiced strong support for this proposal at its June 20, 2018 meeting in Holmes Hall.

	Response Percent	Response Count
Pre-engineering	10.34%	9
Freshman	3.45%	3
Sophomore	12.64%	11
Junior	26.44%	23
Senior (graduating in 2018)	21.84%	19
Senior (graduating in 2019)	25.29%	22



4) Demonstrates how the proposed program responds to national and international needs where Hawai'i and the University have unique or outstanding resources to respond with quality

The University of Hawaii at Manoa is the only campus in Hawaii that confers degrees in accredited engineering programs. Engineering is critical to the continued development of Hawaii's economy. In addition, for several decades the Department of Civil and

Environmental Engineering has had close ties with the construction industry and the General Contractors Association of Hawaii. For example, Mr. William (Bill) Wilson, past President of Hawaiian Dredging and Construction, is a past member of the CEE Industry Advisory Committee and current member on the Dean's Council, College of Engineering. Mr. Russell Young, President, Albert C. Kobayashi, Contractors is currently a member of the Industry Advisory Committee of the Civil Engineering Department.

The Department has been offering a suite of six Construction Engineering courses for over 30 years, but because of other requirements civil engineering degree students can take only a maximum of three of them:

CEE 375 Construction Materials (3) (2 Lec, 1 2-hr Lab) Introduction to the crystalline and molecular structure of materials. Properties of metals, concrete, concrete admixtures, asphalt, wood, and other materials commonly used in construction. A-F only. Pre: 305 (or concurrent); 370. DP

CEE 471 Construction Methods (3) Methods of construction, primarily buildings. Construction types: light and heavy wood; steel; plain, reinforced, and prestressed concrete; masonry. Foundations; associated details of frames, walls, roofs, floors, openings, finishes. Disasters, failures, and their causes. Industrialization of the building process. Pre: 375.

CEE 472 Construction Project Management (3) Introductory treatment of the management of construction. Construction supervision, contract documents, estimating and bidding, organization, planning and scheduling, administration, business methods, safety, and labor. ENGR majors only. A-F only. Pre: 375. (Cross-listed as ARCH 432)

CEE 473 Construction Equipment and Methods (3) Methods and equipment used on horizontal/heavy engineering projects. Available equipment, their production, and how they are used to excavate, move, process, and place the earth. Pre: 375 and senior standing.

CEE 474 Construction Estimating and Bidding (3) Estimating science; techniques of estimating quantities and pricing of work for construction contracting; classification of costs, analysis of plans and specifications for estimating; computerized estimating; cash flow, bidding strategy, preparation and submission. A-F only. Pre: 375.

CEE 476 Construction Planning and Scheduling (3) To teach the theory and the practice of planning, scheduling, and reporting a construction project through the use of bar chart and CPM. Format to include lectures, text, outside speakers, site visits, discussions, case study, and computers. Pre: 375.

5) Meets the basic education needs for which there is a demand by Hawai'i residents

As noted above, ABET has 28 engineering specialties, and we offer only 4 in the College (UHM offers another 2 outside of the College). Construction Engineering is a popular and valuable engineering major, but we don't offer it. The Construction Engineering program is designed to help us satisfy the demand for some of these other programs of study.

2. Program Organization

A. Provides a description of curriculum organization, total credits to complete the program including all prerequisites requirements, admission policies, advising, and other aspects of the program, with reference to its goals/outcomes.

A. 1 Curriculum Organization

The proposed BS degree program in Construction Engineering requires a minimum of 122 credit hours. The required credit hours include the UH general education requirements and those of the program specific to a concentration. All electives are subject to the approval of an advisor. There is mandatory advising prior to registration, every semester.

Students must complete the College of Engineering requirements, which satisfy the University General Education Core Requirements. Two new courses will be needed: one on Construction Law and another on Construction Safety; the School of Law has agreed to cooperate on Construction Law and Construction Safety will be covered by internal and industry-based lecturers. All other courses required for the proposed program currently exist and are taught regularly.

College of Engineering and University General Requirements

The table below lists the course requirements for the College of Engineering that is common to all engineering majors. It totals 51 credit hours. For each course, it shows the number of credits and how the course satisfies the University General Education Core requirements (GEC). General Education Core requirements include

- 6 credits of Global and Multicultural Perspectives (FG);
- 3 credits of Quantitative Reasoning (FQ);
- 3 credits of Written Communication (FW);
- 6 credits from Arts (DA), Humanities (DH), and Literatures (DL);
- 6 credits from Social Sciences (DS); and
- 7 credits of Natural Science in Physical Science (DP) and Laboratory (DY).

Courses	GEC	Credits
<i>Written Communication</i>		
ENG 100 Composition I or approved FW course	FW	3
<i>Arts, Humanities and Literature</i>		
COMG 251 Principles of Effective Public Speaking	DA	3
One 3-credit elective of DH or DL	DH or DL	3
<i>Social Sciences</i>		
ECON 120 Introduction to Economics, ECON 130 Principles of Microeconomics, or ECON 131 Principles of Macroeconomics	DS	3
One 3-credit elective of DS	DS	3
<i>Global and Multicultural Perspectives</i>		
Two approved 3-credit FG electives	FG	6

<i>Symbolic</i>		
MATH 241 Calculus I	FQ	4
MATH 242 Calculus II		4
MATH 243 Calculus III		3
MATH 244 Calculus IV		3
<i>Natural Sciences</i>		
CHEM 161/161L, and 162 General Chemistry/Lab	DP/DY	3/1/3
PHYS 170/170L General Physics I/Lab (4/1)	DP/DY	4/1
PHYS 272/272L General Physics II/Lab (3/1)	DP/DY	3/1
<i>Total Credits</i>		51

In addition, a student must complete the Focus Graduation Requirements:

- One Hawaiian, Asian, and Pacific Issues (H) course.
- One Contemporary Ethical Issues (E) course
- One Oral Communication (O) course
- Five Writing Intensive (W) courses

The undergraduate curricula are designed to be completed in eight semesters. In response to this, the engineering degrees have been exempted from the Hawaiian or Second Language requirement of the UH. To receive a Bachelor of Science degree in engineering, a student must adhere to the following:

1. Complete the course work for one of the engineering curricula, which also satisfies all UH Manoa requirements;
2. Maintain a minimum GPA of 2.0 for all registered credit hours; and
3. Maintain a minimum GPA of 2.0 for all upper division courses (numbered 300-499) in mathematics, science, and engineering.

Program Requirements

Students in the Construction Engineering program must complete an additional 65 or 66 credit hours:

Civil Engineering courses (41/42 credits)

- Comp. Prog. Elective (EE 110,160 or ICS 111) (3 or 4)
- CEE 270 Applied Mechanics I (3)
- CEE 271 Applied Mechanics II (3)
- CEE 305 Applied Probability and Statistics (3)
- CEE 330 Environmental Engineering (4)
- CEE 355 Geotechnical Engineering I (4)
- CEE 361 Fundamentals of Transportation (3)
- CEE 370/370L Mechanics of Materials (3+1)
- CEE 375 Construction Materials (3)

- CEE 381 Structural Analysis (3)
- CEE 489 (B) Surveying and AutoCAD (2) & (C) Professional ethics (1)
- CEE 490 Senior Design Project (3)
- CEE Sustainability Elective (TES) (3)

Construction Engineering courses (~15 credits)

- ACC 202 Introduction to Management Accounting (3)
- CEE 472 Construction Project Management (3)
- CEE 476 Construction Planning and Scheduling (3)
- Construction Safety (up to 3 cr.)
- Construction Law (up to 3 cr.)

Construction Engineering elective courses (minimum of 9 credits)

- CEE 405 Engineering Economics (3)
- CEE 471 Construction Methods (3)
- CEE 473 Construction Equipment and Methods (3)
- CEE 474 Construction Estimating and Bidding (3)
- Appropriate graduate construction course (details below) (3)

A.2 Admission Policies

There is no additional admission policy to the Construction Engineering program other than that of admission to the College of Engineering and the University of Hawaii at Manoa. Requirements for admission to UH Manoa are described in the UH Catalog. High school students applying to the College of Engineering should have completed high school course work including Mathematics up to at least trigonometry, with preference for pre-calculus or high school calculus, and one year of high school chemistry and physics with a special emphasis on grades in these courses (B or better preferred). Students are encouraged to take Advanced Placement courses in these subject areas while in high school and to submit AP scores, but this is not required. The college also uses aptitude tests and high school records in its screening procedure.

Students of the UH system Community Colleges may apply to the College of Engineering for admission as transfer students. Transfer students must have completed ENG 100, MATH 241 and 242, PHYS 170/170L, and CHEM 161/161L and 162 or their equivalents and have a satisfactory GPA.

Students who have not met the admissions requirements directly into an engineering major can enroll as pre engineering (PREN) students. The College offers advising for PREN students, includes them on the email lists for announcements of college activities, and PREN students may register for lower division (100 and 200 level) engineering courses without special overrides provided they meet the prerequisites.

B. Includes an academic map for certificate of achievement, associate and bachelor degrees that demonstrates on time completion.

Proposed curriculum check sheet for the BS Construction Engineering degree

Freshman Year			
Fall		Spring	
ENG 100	3	MATH 242	4
Math 241	4	PHYS 170/170L	4
CHEM 161/161L (DP,DY)	4	CHEM 162	3
DA, DB, DS, DH, FG, FG*	3	EE 110,160 or ICS 111	3/4
	14		15/16
Sophomore Year			
MATH 243	3	MATH 244	3
Phys 272/272L	4	CEE 370/370L	4
COMG 251	3	ACC 202	3
DA, DB, DS, DH, FG, FG*	3	DA, DB, DS, DH, FG, FG*	3
CEE 270	3	CEE 271	3
	16		16
Junior Year			
CEE 305	3	CEE 355	3
CEE 320	4	CEE 361	3
CEE 375	3	CEE 381	3
ECON 120,130,131 (DS)	3	DA, DB, DS, DH, FG, FG*	3
Construction Safety	3	Construction Law	3
	16		15
Senior Year			
CEE 473 or 474	3	CEE 405 or 471	3
CEE 472	3	CEE 476	3
CEE 489B+C	2+1	CEE 490	3
DA, DB, DS, DH, FG, FG*	3	DA, DB, DS, DH, FG, FG*	3
TES	3	TE, CEE 47x or **	3
	15		15

(*) Must take one of each in order to graduate. No substitutions. **Total Credits: 122/3.**

(**) Any 600-level course in the construction area, presently CEE 601, CEE 602, CEE 604, CEE 606, CEE 614, CEE 620, and CEE 672.

The proposed curriculum above fulfills all UHM core requirements as follows.

Foundation requirements:

Written Communication (FW): 3 credits → ENG 100

Quantitative Reasoning (FQ): 3 credits → MATH 241

Global and Multicultural Perspectives (FG): 2 courses → FG, FG

Diversification requirements:

Arts, Humanities, and Literatures (DA, DH, DL): 6 credits → DA, DH

Natural Sciences (DB, DP, DY): 7 credits → DB, CHEM 161+161L

Social Sciences (DS): 6 credits → ECON, DS

In addition, the following DB courses are suggested as more appropriate for the proposed program:

- **OCN 101 Introduction to Environmental Science and Sustainability (3)** Introduction to principles of environmental science and sustainability as they apply to ecosystems. Sustainability will be introduced through active learning with an emphasis on sustaining resources and mitigating pollution to ecosystems. Repeatable one time. A-F only. **DB**
- **GEOG 309 Introduction to Biogeography (3)** Introduction to ecosystem concept; environmental adaptations for energy and nutrient transfer; characteristics, dynamics, productivity, and distribution of principal vegetation communities. Human dominance. Pre: sophomore standing or higher, or consent. **DB**
- **PEPS 210 Introduction to Environmental Science (3)** Analysis of our environment with emphasis on understanding relationships and interactions of physical, biological, technological, and political components using scientific methods of inquiry. Food supply and safety, water quality, pollution control, biodiversity, environmental policy. Open to nonmajors. (Cross-listed as NREM 210) **DB**
- **TPSS 156 Natural History and Conservation of Hawai'i Island (3)** The formation of the Hawaiian Islands, establishment of their native terrestrial and marine flora and fauna, and human impacts and conservation. A-F only. Co-requisite: 156L. (Summer only) **DB**
- **TPSS 200 Agriculture, Environment, and Society (3)** Relationship of plants, soils, and the environment, and how they relate to cultural practices and society in agroecosystems with an emphasis on Hawai'i as a model system. **DB**
- **BOT 110 Biodiversity: Evolution, Ecology, and Conservation (3)** Lecture exploring the range of Earth's diversity, the evolutionary processes that generate it, the ecological roles it plays, the consequences of its loss, and the processes by which it can be conserved. A-F only. (Fall only) **DB**

C. Provides justification for a program that is more than 30 credits for a certificate of achievement or 60 credits for an associate degree or 120 credits for a bachelor's degree.

Because of the requirements of the engineering profession, specific training in certain areas of specialty is necessary for a BS degree in engineering, which increases the total, required credit hours. Currently, the minimum credit hours required are 124 for a BS degree in Civil

Engineering, 125 for a BS degree in Computer Engineering degree, 122 for a BS degree in Electrical Engineering degree, and 125 for a BS degree in Mechanical Engineering.

D. Describes provisions for articulation with UH Community College degrees for bachelor's degrees.

As the demand for engineers in the State of Hawaii's workforce continues to increase, the University of Hawaii (UH) College of Engineering (CoE) has been looking at innovative academic pathways for students of all ages and educational backgrounds to obtain the necessary knowledge and course work to graduate with an accredited Bachelor of Science (BS) degree in engineering - Civil, Computer, Electrical, and Mechanical.

One such pathway (UHCC-UHM CoE MOU) is to assist students who choose the UH Community College (CC) pathways for various reasons, ranging from simple tuition finances to preparatory course work, to obtain their ultimate goal of a BS in Engineering.

As a student achieves the requirements for an Associate of Science in Natural Science (AS-NS) degree with a Pre-Engineering Concentration from the UH CC, it will provide a direct pathway to travel from the UH CC as a completing sophomore status to the UHM CoE as a continuing junior status. This, in essence, is a direct 4-year degree requirement for a BS in Engineering even though a student may begin at a UH CC.

Currently, the UHM CoE accepts 200+ transfer/AS-NS students on a yearly basis. A high percentage of these UH CC students complete their BS in Engineering requirements and become productive members of the State's engineering community.

3. Student Demand

A. Describes the profile of students who will likely enroll in the program and includes a discussion on the likelihood of the program attracting new students to the campus or existing students.

It is envisioned that students who will enroll in the program will include existing engineering students and new students. According to sample data shown in the previous section and conversations with local practicing engineers who mentor high school students, there exist a fairly large number of students who are interested in pursuing construction related careers. With the proposed degree program in place, we will be able to attract the students who would otherwise go to the mainland to obtain a Construction Engineering degree.

B. Provides evidence of student interest (i.e. needs assessment)

This has been addressed in detail in section 1.C.2. Student interest is strong and about one-half of recent Civil Engineering graduates pursue a career in construction in spite of the fact that they have had a limited exposure to construction engineering through the curriculum in civil engineering. The proposed program addresses this limitation of graduating underprepared construction engineers via the existing BSCE degree.

C. Includes an estimate number of majors per year with an explanation on how this number was determined.

As shown in section 1.C.2 survey results, 33% of the students who responded support the establishment of the new program. The estimated number of enrollment in the four year program is about 100. The number is expected to grow as the program becomes more known and established. With existing resources, the program will easily accommodate 100 students from the exiting BSCE program and 50 new students.

	Previous Year	Previous Year	Current Year	Projected Year 1	Projected Year 2	Projected Year 3	Projected Year 4
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
ENROLLMENT (Fall Headcount)							
BS in Construction Engineering			n/a	20	50	75	100
All Engineering Undergraduate	306	310	310	290 *	294	299	300
All Engineering Graduate	60	55	58	60	60	60	60
COMPLETION (Annual)							
BS in Construction Engineering			n/a	n/a	5	15	20
Engineering Undergraduates	84	104	110	110	100	100	105
Engineering Graduate	14	13	15	15	15	15	15

* We anticipate that some Civil Engineering majors will change to Construction Engineering.

4. Program Resources and Efficiency

A. Describe resources required for program implementation and first cycle operation

1) Number, source, and cost of faculty; library requirements; support personnel; estimated cost of supplies, equipment and CIP; facilities to be utilized.

A number of existing faculty are already active in the areas of the program (e.g., Akiona, Shen and Singh already teach most of the construction courses listed for the proposed degree.) No special library requirements are anticipated. Existing College staff will provide support for the program. Existing classrooms, lab resources, and offices are currently in place that will also be utilized by the program. This new program will increase the efficiency of existing resources and generate additional tuition revenue, especially as it attracts students that would otherwise choose a mainland university.

CURRENT RESOURCES/FUNDING	Current Year
Tuition/Special Fund Allocation	\$129,044
General Fund Allocation	\$2,058,549
Summer Session Allocation	\$73,000
Program/Course Fee Allocation	\$228,037

CURRENT ACADEMIC PERSONNEL	Current Year
Current Faculty FTE	15.75
Current Faculty Salaries (\$)	\$1,783,805
Current Lecturers (\$)	\$19,000
Current Graduate TAs	7

	Current Year	Projected Years			
	2018-19	2019-20	2020-21	2021-22	2022-23
PROJECTED ACADEMIC PERSONNEL (I-Faculty)					
Projected New Faculty FTE	1	0	1	0	0
Projected New Faculty Salaries (\$)	\$90,000	0	\$95,000	0	0
Projected New Lecturers (\$)	0	0	\$12,000 ¹	\$12,000	\$12,000
Projected New Graduate TAs	0	0	0	0	0

1. Two lecturers, each teaching one course.

	Current Year	Projected Years			
	2018-19	2019-20	2020-21	2021-22	2022-23
G. TOTAL NEW PROGRAM RESOURCES (e.g., new positions, lecturers, equipment or software for labs, accreditation fees, insurance, compliance costs, reporting, vendor contracts, etc.)					
Additional lecturer from 2020-21 ¹			2	2	2
Accreditation application				\$6,000	\$800
Total New Resources Needed			\$107,000	\$18,000	\$12,800

1. Two lecturers, each teaching one course. Ongoing

B. Describe the expected sources of funds, including sources of reallocated funds.

The proposed program uses existing resources. Additional funding can be covered under currently approved funding, except for the new faculty position in 2020-21.

C. Compare anticipated cost per SSH, cost per major, SSH/faculty, average class size or other quantitative measure with other programs in the college and similar programs on other UH campuses.

New courses in Construction Safety and Construction Law will be developed. We anticipate hiring two lecturers from 2020-2021 to teach one course per year each to teach these courses. We have invested in the hiring of a new faculty member who will teach in the program (2018-2019). Existing resources are sufficient to support program costs. However, should the program grow as anticipated, we may request to hire a new faculty in 2020-2021 (or later); this is indicated in the table. It should be noted that there is a lot of synergy between the Civil Engineering program and the Construction Engineering program, and all students take courses from both programs. Therefore, a hire in one program also supports the other program.

	Previous Year	Previous Year	Current Year	Projecte d Year 1	Projecte d Year 2	Projecte d Year 3	Projected Year 4
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
COURSES, SECTIONS, SSH (Annual)							
Projected New Courses			0	1	2	2	2
Projected New Sections			0	1	2	2	2
Projected New SSH			0	100	110	121	133
Current Courses Offered ¹	25	25	25	25	25	25	25
Current Sections Offered ²	60	60	60	60	60	60	60
Current Annual SSH ³	7,667	7,667	7,667	7,667	7,922	8,203	8,513

1) Approximate count depending on electives and cross-listed courses offered.

2) Most course do not have sections; we have sections for labs; all labs are W limited to 20 students

3) Manoa Institutional Research Office reports average SSH for Civil Engineering graduates = 115 (includes non-Civil Engineering courses). Years to graduation = 4.5. Assumed Civil Engineering majors = 300

- D. List similar programs at other UH campuses and describe how the proposed program differs or is similar to these programs. Provide rationale for the new program if there are similar existing program(s).**

There is no other ABET-accredited engineering program that is similar at any UH campus.

5. Program effectiveness

- A. Describe the plan for assessing the quality of student learning.**

The Construction Engineering program will be evaluated using the assessments used by the Department of Civil and Environmental Engineering with minor modifications for the Construction Engineering program. The Departments have the following assessments:

Course assessments: Every semester, the Department administers a student survey of all courses to determine the effectiveness of the course and its instructor. Course content is also periodically reviewed and assessments are made as part of the ABET accreditation requirements.

The CEE Department already has an Industrial Advisory Committee made up of representatives from industry including the construction industry. They provide feedback from employers of our graduates about the undergraduate program. The board meetings are held twice annually and cover an overview of the program including laboratory tours, and meetings with students.

Senior Project Report Assessments: The Construction Engineering program will require a 3 credit senior project course which is the capstone design course. The quality of a sample of projects is assessed every spring semester by a panel of reviewers from the industry.

The CEE department plans to survey both civil engineering and construction engineering graduates to determine where they get their initial employment after graduation.

B. Identify relevant program accreditation and plans to meet accreditation requirements.

College of Engineering will apply for the Construction Engineering program to be accredited by ABET, which is the national accreditation organization for engineering programs. Demonstrating effective assessment of student performance and a process for continuous improvement is a major part of achieving accreditation. The estimated earliest date for ABET accreditation is in year 2022.

6. Conclusion

In summary there is strong evidence of the need of an ABET-accredited, construction engineering degree program at University of Hawaii at Manoa. The new degree will not only provide additional educational opportunities to the students in Hawaii, but it may also attract more students nationally and internationally. The new program will provide engineers with necessary technical skillsets for the booming construction industry in Hawaii and the nation, given the overall poor-to-mediocre state of public infrastructure and the need for more development and construction due to continuous population growth. Current resources are sufficient to ensure the successful launch of this program as well as secure its accreditation by ABET like all the existing engineering degrees offered at UHM.

DISCLAIMER – THE FOLLOWING ARE DRAFT MINUTES AND ARE SUBJECT TO CHANGE UPON APPROVAL BY THE COMMITTEE ON ACADEMIC AND STUDENT AFFAIRS

MINUTES

BOARD OF REGENTS COMMITTEE ON ACADEMIC AND STUDENT AFFAIRS MEETING

MARCH 14, 2019

I. CALL TO ORDER

Committee Chair Michelle Tagorda called the meeting to order at 9:57 a.m. on Thursday, March 14, 2019, at the University of Hawai'i at Mānoa, Information Technology Building, 1st Floor Conference Room 105A/B, 2520 Correa Road, Honolulu, Hawai'i 96822.

Committee members in attendance: Committee Chair Michelle Tagorda; Committee Vice Chair Kelli Acopan; Regent Eugene Bal; Regent Ben Kudo; Regent Alapaki Nahale-a; Regent Jan Sullivan; Regent Robert Westerman.

Others in attendance: Board Chair Lee Putnam; Board Vice Chair Wayne Higaki; Regent Simeon Acoba; Regent Michael McEnerney; Regent Ernest Wilson, Jr.; Regent Stanford Yuen (ex officio committee members); President/UH-Mānoa (UHM) Chancellor David Lassner; Vice President for Community Colleges John Morton; Vice President for Legal Affairs/University General Counsel Carrie Okinaga; Vice President for Academic Planning and Policy Donald Straney; Vice President for Research and Innovation Vassilis Syrmos; Vice President for Information Technology/Chief Information Officer Garret Yoshimi; Interim UH-Hilo Chancellor Marcia Sakai; UH-West O'ahu (UHWO) Chancellor Maenette Benham; UHM Vice Chancellor for Research/Interim Vice Chancellor for Academic Affairs Michael Bruno; Executive Administrator and Secretary to the Board of Regents Kendra Oishi; and others as noted.

II. PUBLIC COMMENT PERIOD

Board Secretary Oishi announced that the Board Office received no written testimony and no individuals had signed up to provide oral testimony.

Regent Sullivan arrived at 9:58 a.m.

III. AGENDA ITEMS

A. University of Hawai'i Student Caucus Presentation

University of Hawai'i Student Caucus (UHSC) leaders Christielove Espinosa of UHWO, Caucus Chair; Andrew Kalani Simeona of UHM, Caucus Secretary; and Bernadette Rose Garrett of Windward Community College (WinCC) provided an overview and composition of the UHSC and a fall 2019 update, including UHSC's 2018-2019 objectives, progress made by its standing committees, UHSC highlights, and expectations of its relationship with the board.

Regent Sullivan arrived at 9:58 a.m.

Progress was noted on open educational resources (OER) toward the goal of 30% OER by 2020, including the receipt of additional funding from administration with the hope of encouraging faculty and student involvement. The UHSC Transportation Committee has been working on a survey and express hopes to continue the U-Pass initiative. The UHSC leaders expressed concerns regarding affordability such as food security and emergency funds. Mental health issues were also raised, including connections to affordability, issues relating to the volcanic activity on Hawai'i Island, students working multiple jobs to make ends meet, and concerns relating to the counselor-to-student ratio at campuses.

The UHSC leaders expressed appreciation to Regent Acopan and former Regent Higa for their efforts in advocating on behalf of students and expressed a desire to strengthen communication and the relationship with the board.

Regent Kudo expressed his thought that students do not realize their importance and power with the public and the legislature. He suggested the UHSC consider adding two committees: one on learning environment and another on sustainability, to address issues such as buildings, facilities, and dorms, and how campuses can be made more sustainable.

Regent Nahale-a commended the UHSC leaders for their service and asked how they are selected. Ms. Espinosa explained that campus-level elections occur first, which includes a campaign, nomination, and election process. The student governments decide who attends the UHSC, and are typically the president and vice president, although some campuses have designated positions where duties include attending UHSC meetings. Within the student caucus, there is an internal election for officers.

Board Vice Chair Higaki echoed Regent Kudo's sentiments regarding legislative advocacy. The UHSC leaders suggested that it would help if the board could respond to UHSC resolutions to be aware if positions are aligned.

Regent Acopan commended the UHSC leaders for their service and for balancing their personal, professional, and academic areas of their lives. She noted that caucus membership can be challenging because there are constant changes because the role is voluntary. Continuity is a challenge and it would be helpful for new student leaders to be briefed on procedure.

Regent Wilson commented that mental health and homelessness are serious issues. He asked whether they are involved in homeless issues relating to students. The UHSC leaders responded that they haven't touched upon the homeless issue, but will consider how they can put more effort into that area. Regent Acopan added that homelessness was one of the driving factors behind the creation of food pantries.

Regent Acoba observed that continuity is a concern and asked whether there is staff or an advisor to maintain the impetus on any particular project. He also inquired how we compare to peer institutions on mental health, whether every campus has access to mental health services, and whether the possibility of a requesting assistance from the medical school has been considered. Hae Okimoto, Associate Vice President (AVP) of

Student Affairs, serves as the advisor and works closely with the advisors for each campus. The UHSC leaders do not know how UH compares to peers. Every campus has a mental health counselor, but not enough to fill the need. They have not engaged in discussions with the medical school. They have considered assistance from graduate students, but there are qualifications that need to be met. AVP Okimoto added that part of the issue is that there are stringent guidelines about supervision and a licensed practitioner is needed, otherwise there is no client-patient confidentiality agreement.

Regent Yuen inquired about issues beyond the university system and who advises them. He suggested they consider having community organizations conduct educational presentations to support their efforts, such as with sustainability, and to also review national data.

Board Chair Putnam asked about the emergency fund mentioned in the presentation and the source(s) of funding. The UHSC leaders replied that other universities receive a grant or use student fees and that it is a one-time payment and not a loan, and most universities employ it as a last resort. Hawai'i Community College (HawCC) received a donation from Central Pacific Bank to assist students impacted by the volcanic activity, and guidelines were developed. The difficulty is obtaining the funds.

B. Options for Program Approvals and Delegations

VP Straney provided an overview of four categories of program proposals: resource intensive, reallocation of existing resources, modification of existing programs, and programs requiring rapid planning and implementation to meet workforce needs. Currently, the board reviews and approves all program proposals. VP Straney offered suggestions on the types of approvals that could be delegated to the president and asked regents to submit their feedback to the board secretary.

C. Review and Recommend Board Approval to Change from Provisional to Established Status: Associate of Science in Business, Kaua'i Community College

VP Morton provided an overview of the request for approval to change from provisional to established status the associate in science in business at Kaua'i Community College (KauCC). He noted that this program consolidated several programs and created a structure that allows flexibility to address demands. He added that there is strong interest from the students and community and that the program allows for transfer to UHWO for a bachelor's degree.

Regent Sullivan commended KauCC's work and the incorporation of an advisory board. She suggested incorporating internships. Dirk Soma, business instructor at KauCC, noted that there is a capstone course that includes an internship requirement.

Regent McEnerney commended the program and asked how many students are Kaua'i residents, where other students come from, and whether KauCC tracks graduates. Mr. Soma said that about 90% of students in the program are Kaua'i residents and that the entrepreneurship pathway attracts some out-of-state students, and that 100% of students are working in their field, with some having started their own business and some transferring to a 4-year program.

Regent Westerman expressed his support for the program. He asked for clarification on what a “cycle” is in the context of a program changing from provisional to established status. VP Morton explained that under current policy, a program is in provisional status for 50% of time beyond the type of degree, for example, 3 years in provisional status for a 2-year program.

Regent Westerman moved to recommend board approval to change the associate of science in business at KauCC from provisional to established status, Regent Sullivan seconded, and the motion carried unanimously.

VP Morton added that the decline in traditional community college programs is occurring across campuses and that specialized niches will be redirected into broader programs.

D. Review and Recommend Board Approval to Change from Provisional to Established Status: Associate of Science in Natural Science at the following campuses:

- 1. Hawai'i Community College**
- 2. Honolulu Community College**
- 3. Kaua'i Community College**
- 4. University of Hawai'i Maui College**
- 5. Windward Community College**

VP Morton provided an overview of the request for approval to change from provisional to established status for the associate of science in natural science at five campuses as noted. He noted that this is not a career and technical education program and it is intended to allow for transfer into bachelor degree programs.

VP Morton elaborated that historically, there has only been an associate in arts degree, and students who had an interest in science and engineering were taking courses not in that path. Associate in science degrees were started several years ago at KapCC and were very popular, growing to 900 majors. There is a dramatic increase in student interest and productivity and it is recommended that the other five campuses also participate in these efforts.

Regent Westerman asked where this item would be placed if the board were using the approval processed proposed by VP Straney in agenda item III.B. VP Morton replied that it would likely be considered in the top category, “resource intensive.”

Regent Nahale-a moved to recommend board approval to change the associate of science in natural science at HawCC, HonCC, KauCC, UHMC, and WinCC from provisional to established status, Regent Sullivan seconded, and the motion carried unanimously.

E. Review and Recommend Board Approval for the Establishment of a Provisional Bachelor of Science in Construction Engineering, University of Hawai'i at Mānoa

Vice Chancellor (VC) Bruno provided a brief overview of the request for approval to establish a provisional bachelor of science in construction engineering at UHM. He

explained that a large share of graduates enter the construction industry. He added that there are plans to add courses in construction law and construction safety.

Regent Westerman asked whether the university has worked with the Department of Commerce and Consumer Affairs to ensure this is an acceptable degree that meets their standards. VC Bruno responded that the program is Accreditation Board for Engineering and Technology, Inc. (ABET)-accredited, which is the standard, and there is no concern over meeting requirements.

Regent Acoba inquired as to whether this is an effort to increase the offering of masters degrees and if so, if it is intended to meet a particular need or deficiency. VC Bruno explained that all of the programs proposed on this agenda are intended to address a need and were strategic decisions.

Regent Yuen asked how construction engineering differs from civil engineering. Dr. Panos Prevedouros, Chair of Civil and Environmental Engineering, explained the details of ABET accreditation and that there are separate and unique criteria for construction. The number of credits is the same and they are parallel degree paths. There is a focus on construction courses during a student's senior year.

Regent Yuen asked whether there is a Professional Engineer (PE) license specific to construction engineering. Dr. Prevedouros responded that there is only one general PE license and that this program is one pathway.

Regent Tagorda inquired about the point at which students receive support on making a decision on the most suitable engineering pathway. H. Ronald Riggs, Interim Dean of the UHM College of Engineering, explained that students are required to meet with a faculty advisor at least once a semester.

Regent Sullivan moved to recommend board approval of a provisional bachelor of science in construction engineering in the Department of Civil Engineering at UHM, Regent Kudo seconded, and the motion carried unanimously.

F. Review and Recommend Board Approval for the Establishment of a Provisional Master of Asian International Affairs, University of Hawai'i at Mānoa

VC Bruno provided an overview of the request for approval to establish a provisional master of Asian international affairs at UHM, indicating a strong need for this type of program which has potential to expand into certificate programs.

Regent Acoba asked about the scheduling of faculty and how it reconciles with course offerings in the evenings, on weekends, and online. He also asked whether the East-West Center offers anything similar. Dr. Cathryn Clayton, Chair of the UHM Asian Studies Program, explained that the program is designed around accommodating students who will most likely have full-time careers. This will be a full-fledged masters' program and is different from East-West Center offerings. It was also clarified that this will be provided through the School of Pacific and Asian Studies and not through the outreach college. Regent Acoba expressed that the program appears to have potential and hopes it can be distinguished from programs at other schools.

Comments were made that there is potential for participation by military personnel worldwide and non-traditional students, and a suggestion that a cultural aspect be included to elevate Hawaiian culture as a significant world view. Several regents expressed that this program has great potential, is much-needed, and overdue. There was discussion on the potential to partner with other schools such as the Shidler College of Business to allow students to benefit from other faculty and to break down siloes.

Regent Acopan moved to recommend board approval, seconded by Regent Westerman, and the motion carried unanimously.

G. Review and Recommend Board Approval for the Establishment of the Following Provisional Programs:

- 1. Master of Science in Information Systems, University of Hawai'i at Mānoa**
- 2. Master of Science in Marketing Management, University of Hawai'i at Mānoa**
- 3. Master of Science in Finance, University of Hawai'i at Mānoa**

VC Bruno provided an overview of the establishment of three master of science programs in information systems (MSIS), marketing management (MSMM), and finance (MSF), within the Shidler College of Business. Dean Vance Roley explained that there are two existing specialized programs, accounting and human resources.

Regent Sullivan expressed concerns about the lack of practical application in the UHM information and computer science (ICS) program that makes it hard for graduates to compete in the workforce, the need to properly allocate resources to the ICS program, and the future of the ICS department and program. She requested administration focus on building the much-needed and in-demand ICS undergraduate program. VC Bruno explained that the hiring of new faculty has been aligned with the direction administration wants to take the department.

Regent Sullivan expressed concern about building separate silos and asked if there was a way for the ICS undergraduates to benefit from the faculty at Shidler. VC Bruno responded that the aim is to break down silos and faculty at the new Hawai'i Data Science Institute (HI-DSI) have been engaged with faculty across the university. Dean Roley explained that Shidler works with other units and gave the example of the interdisciplinary Communication and Information Sciences PhD program at Shidler that integrates communication, computer science, library studies, and management information systems.

Board Chair Putnam asked why the start date is 2020 instead of 2019. Dean Roley explained that marketing needs to occur to reach the desired class size, but that students could start taking some courses earlier and the formal launch would be in 2020.

Regent Acopan departed at 11:54 a.m. Quorum was not affected.

Regent Kudo asked whether the MBA program could have been designed to include specialization or an emphasis in a particular area. Dean Roley noted that some larger MBA programs include specialization and that UHM could consider requiring certain core courses and adding a specialization. He added that this was a good idea that hadn't previously been considered, and that employers are indicating that specialty courses aren't enough, so specialized degrees are gaining popularity.

Regent Wilson asked whether artificial intelligence is addressed in the program and curriculum. Dr. Tung Bui, Chair of UHM Information Technology Management (ITM) department, explained that business core curriculum was modified a few years ago to include a component on data analytics, and there are elective courses on data analytics and business intelligence available at the undergrad and graduate level. The chairs for the three MBA programs are working on integrating a combined course.

Regent McEnerney asked how the UHM MSIS degree compares with the MSIS degree at Hawai'i Pacific University. Dr. Bui explained that a competitive analysis was performed and UHM is accredited by AACSB International, the curriculum is based on the top 10 programs in the country, and the faculty line-up is superior. He does not think there is any competition, and noted that the local demand outweighs the market.

Regent McEnerney asked whether the MSF degree was being designed to help students get through the chartered financial analyst (CFA) and certified financial planner examinations. Dr. Victor Huang, Chair of the UHM Department of Financial Economics and Institutions, explained that coursework is being designed to help students take the examinations. Regent McEnerney suggested that the final examination could be the capstone requirement for the degree. Dr. Huang indicated they could consider using passage of the CFA level 1 exam as a substitute for taking the capstone course.

Regent Kudo moved to recommend board approval, seconded by Regent Nahale-a, and the motion carried unanimously, with the exception of Regent Acopan who was excused.

IV. ADJOURNMENT

There being no further business, Regent Nahale-a moved to adjourn, Regent Sullivan seconded, and with unanimous approval, the meeting was adjourned at 12:17 p.m.

Respectfully Submitted,

Kendra Oishi
Executive Administrator and Secretary
of the Board of Regents