



UNIVERSITY
of HAWAII®
MĀNOA

College of Engineering

BRENNON T. MORIOKA
DEAN

February 8, 2021

MEMORANDUM

TO: Michael S Bruno, Provost
Laura E Lyons, Interim Associate Vice Chancellor of Academic Affairs
Krystyna S Aune, Dean, Graduate Division

FROM: Brennon T Morioka, Dean, College of Engineering

SUBJECT: Response to the Recommendations in the College of Engineering Graduate Program Review of October 12-13, 2020.

The students, faculty, and administration of the College of Engineering that includes the Graduate Program Departments of Civil, Electrical, and Mechanical Engineering greatly appreciates the time and effort of the External Review Committee consisting of Drs. Leighton Lum, Ken Cheung, and Eva-Marie Nosal in reviewing the College's three graduate programs on October 12-13, 2020. The College's administration communicated with the three graduate program department chairs and graduate program chairs to reply to the set of recommendations as presented by the reviewers in their final report. This memorandum incorporates the combined responses from the College as well as the individual program departments.

Responses to Recommendations:

COLLEGE-LEVEL RECOMMENDATIONS

1 (p. 3)

We recognize, applaud, and strongly recommend the continued support and prioritization of CoE by UHM leadership.

An "Economic Diversification Committee", possibly an extension of the Dean's Council or External Advisor Committee, formed from a diverse set of stakeholders and sectors could be an effective and powerful mechanism to help the College plan and pivot strategically in response to new challenges and opportunities.

RESPONSE: The College agrees with this recommendation and has been more aggressive in restructuring the composition of the Dean's Council to include and involve other members of the community – banks (American Savings Bank), advocacy groups (Transform Hawai'i), and diverse companies (DataHouse, Hawai'i Dental Services, etc.) as well as introducing more industry related projects. Hopefully, this transition can be gradual but achieve the diversity that the College wants to manifest, which shows the breadth of the engineering profession. The College has also already taken steps to insert itself in many economic sector discussions in building growth areas of technology and innovation that the College has not typically participated in let alone led. This is definitely a role the College should and will be playing.

2 (p. 3)

Certificate programs could enhance the skill sets of graduate engineers by supplying necessary supplemental background for many disciplines. At Dr. Lum's former company, R.M. Towill Corp.

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Wastewater Department, an MS Degree is encouraged but background in selected areas is a requirement. This is implemented by having personnel take selected courses from the College of Engineering MS program in Environmental Engineering. A certificate program could fill this need. Care should be given toward the development of this program such that it does not “rob” from the MS Program. However, it could work in favor of recruitment as some may view the certificate as halfway to an MS so it may facilitate a decision to obtain the MS.

RESPONSE: The College has been investigating greater capacity of more specific tracks and/or concentrations within the MS graduate programs especially through the use of the BAM (Bachelors and Masters) accelerated program – construction, energy, sustainability, etc. With industry’s input, the College hopes to carefully develop these programs including some certificate programs to assist with industry but not hinder the research developments in each discipline. We do believe that overlaps between BAM and any certificates will not be noticeable and do not hinder the BAM program because their academic characteristics have different origins. The College and our departments will continue to evaluate the use and introduction of certificate programs for students' specialization especially as this offering can serve as an additional revenue generating program.

3 (p. 4)

Restructuring should be conducted strategically. It should be data-driven, and involve open dialog and input from all involved levels and sectors.

RESPONSE: The College agrees with this assessment and it should be noted that the restructuring has already commenced for relocating Aerospace Engineering to be a concentration under Mechanical Engineering as the alignment of coursework and research content has many overlaps. Also within the Mechanical Engineering department, we have engaged with the School of Ocean and Earth Science and Technology (SOEST) and its Hawaii Institute of Geophysics and Planetology (HIGP) to explore the creation of a more focused concentration in Material Science and Engineering, which would be a much broader cross-unit program offering while being housed within the Mechanical Engineering department. Biomedical Engineering is quite broad in academic content and research breath; thus, it exists in Electrical (sensors) and Mechanical (prosthetics), so there have been continued discussions about a separate program in the future. With the growing interest of the engineering aspects associated with Bio Engineering, the College has already been collaborating with the College of Tropical Agriculture and Human Resources (CTAHR) in an effort to co-hosting an Agricultural Engineering degree program between CTAHR and the College of Engineering. The establishment of an undergraduate Ocean Engineering track in Engineering Science has been progressing with the inputs of Ocean, Civil, and Mechanical Engineering programs. The goal is to utilize the BAM to combine the BS ENGS in Ocean Engineering to serve as a feeder program into the MS in Ocean and Resources Engineering (ORE).

4 (p. 5)

Prioritize graduate student well-being and success beyond the typical Advisor/Student relationship. Graduate students support the research enterprise at an R1 institution; they are our future and their well-being should be a high priority. Add systems and/or programs to ensure needs are addressed and do not fall through the cracks.

One support method is to have a graduate student advocacy position to address overall student-life needs. The advocate could take the lead in the following support areas:



- *Identify resources available, such as what support is available at Graduate Division and other offices across the campus (such as the International Student Services Office).*
- *Be the lead on improving communication between Departments and Graduate Division*
- *Be a resource to go to for students who come in without a research advisor. The College would need to be involved in developing a “system”.*
- *The advocate should maintain procedures or direction on a variety of issues in writing. For example, graduate Student “Handbooks” could be expanded and updated to include information related to student support.*
- *Introduce a mechanism, preferably separate from the student academic/research advising process, to identify and assist “at risk” graduate students (e.g. those facing funding uncertainty; caught in disputes/delays/issues beyond their control; facing issues inconsistent advising etc.) of which the advocate can oversee.*

Department Student Handbooks: Expand content (if needed) and awareness of the handbooks, and update them regularly. If not already included, add non-academic items related to administration and everyday living and emergency needs.

Foster Graduate Student Interaction - Graduate students can internally provide excellent support for each other. The College can promote this by supporting initiatives aimed at graduate student activities and interaction. Possibilities:

- *Develop mechanisms that foster cohort-building and student interaction. Possible opportunities include: offer a common course for ME (or, more broadly, CoE) incoming graduate students; encourage club and/or society activities among students; host department mixers with effort targeted at welcoming and introducing incoming students and other personnel; broaden and re-energize the ME seminar series*
- *Consider centralized/consolidated graduate student office space*
- *Incentivize joint projects and peer-to-peer mentoring among graduate students.*

RESPONSE: The College agrees with the majority of these recommendations, and there has already been much progress on these fronts that the review committee may not have been aware of. As a whole, there are two approaches on this position: 1) in all the departments, the graduate chair has played the key role in monitoring the academic, mental, and physical well-being of their department graduate students but there may have been shortcomings due to time limitations and commitments; and 2) utilizing the current pool of outstanding graduate students to peer mentor and track the emotional and physical well-being of their fellow graduate students through more structured graduate student gathering of all the disciplines for networking as well as collaboration. The shortcoming for the extended responsibility of the graduate program chair will be if and when the program grows; even more time commitment by the graduate chair will be required. For the graduate student, the limitations will come from the academic data accessibility of peers. If the College seeks to create a new and separate graduate student advocate position, this will be very dependent on our financial situation and personnel limits. While we do believe that such a position and service of someone who is equipped with the skills and information to help with a variety of life challenges faced by graduate students beyond the academic challenges would be very beneficial to our graduate students, it is highly unlikely that such a position would be pursued by the College at this time as the College's priorities for position requests would be focused on administrative support that is clearly lacking in position counts commensurate with the activities and size of the College in comparison to other units and departments on campus, as well as, replacing faculty



positions lost to the recent legislative sweeps and the hiring freezes by the University. As such, the College will seek to work on other alternatives that might help provide similar services to our graduate students to achieve the same goal. We also believe that the University should better market, advertise, and provide easier access to the information regarding the existing University support services as there are many existing programs that many students are simply not aware of. The College will assist in this effort by including this information in the department handbooks and websites.

Each department (CEE, EE, and ME) already has their own individual Department Student Handbook. We also understand the each department will be revisiting their handbooks for relevance of content and effectiveness in achieving its intended goals and purpose.

While there are some collective graduate student offices, especially for teaching assistants, and as the College moves forward with a combined tutoring service, there should naturally be more networking and collaboration. However, the College does not agree that it is in the students' nor our faculty researchers' best interests to wholesale in the comingling of graduate students of unrelated disciplines into the small office spaces that the College has access to as these are the environments in which actual research collaboration and discussion occurs which is their primary purpose for being here. And while we are in complete agreement that additional networking between students of different disciplines is important and would enhance their overall experience here, we believe it is important for the College and the departments to find other means to help facilitate such exposure.

We understand that the CEE department is currently working on initiatives to better guide incoming M.S. and Ph.D. students, especially ones whose research adviser is not yet decided. CEE will also be implementing a graduate co-mentoring system in which a graduate student will have two advisors: one academic advisor as a general mentor and the other as a research advisor who will supervise the graduate student for degree completion. Depending on the level of success, it is possible this approach could be adopted by the other departments within the College.

We also recognize that joint-work among graduate students is often initiated and influenced by their faculty's research collaboration. CEE is currently establishing an internal co-advising system for closely collaborating faculty members to improve research cooperation and academic exchange. We will evaluate this as well to determine if it should be implemented College-wide.

5 (p. 5)

Review graduate assistant compensation rates. Among the items of potential concern:

- *Evaluate pay rates and cost of living consistency with the costs of living in Hawaii and with sister colleges across the nation to ensure competitive compensation rates to attract and retain top students.*
- *Consider implementing a college-level policy regarding (minimum levels) for student pay rates. This could help protect graduate assistants and ensure fair treatment by requiring overview at the Dean's level for cases of lower-than-CoE recommended rates. Support above minimum should be encouraged (e.g. by raising pay steps if a PI is able, or by paying overload).*

Initiate a "rainy-day" fund and/or scholarship to provide support for students in need.



Pursue philanthropic fundraising for graduate student scholarship and support.

Encourage and help graduate students apply for scholarships and fellowships (federal, private, and other)

Solicit continued feedback from graduate students regarding their needs and experiences. We found that some students were (understandably) reluctant to speak openly in a public setting – allowing a mechanism for confidential and/or anonymous feedback and response could help.

RESPONSE: UHM does have a minimum GA rate for TA (teaching assistantship) at Step 8 for a 9-month appointment (\$18,930 plus tuition waiver). The College has attempted, in the past, to implement a slightly higher appointment of Step 10 (\$20,472 plus tuition waiver); however, as TA appointments are department teaching needs, the final decisions and budgetary constraints are delegated to the respective departments to provide these academic services within their budgetary means. Currently, the CEE and ME programs use Step 10, and EE program uses Step 8 as their salary starting points. The GA rates for RA (research assistantship) will vary greatly from Step 8, to begin as incoming MS students, to as high as Step 20 (\$30,312 plus tuition waiver) for highly experienced and qualified PhD students, but these RA appointments are heavily dependent on the budgets of individual projects and needs based on the grant proposals by the faculty. Faculty can submit proposals requesting larger budgets for RA salaries, however, this puts their proposals at risk of not being funded by sponsor agencies because of increased budgetary asks compared to available funding resources by these sponsoring agencies.

The creation of a 'rainy day' fund as well as graduate student specific scholarships (ARCS, EE Black, Boeing, Northrup Grumman, SEA0H, etc.) have existed for some time, but greater efforts will be considered in pursuit of these types of accounts. There is currently a great philanthropic effort in upgrading of the instructional and research labs to provide better environments for teaching and research; thus, graduate student support needs can also be included. CEE is also considering looking into creating a "Sunny-day" fund to encourage graduate students' academic excellence. The College will also work with the departments to help support faculty advisors in encouraging and assisting graduate students who are interested in applying for NSF and SMART scholarships.

Communication of these scholarship and grant opportunities are already in place, however, greater effort will be made to improve these announcements - via email, social media, twitter, text messages - these scholarships, fellowships, and grants to the current pool of graduate students to utilize if they have not done so in the past.

The College also provides multiple forums for both undergraduate and graduate students to provide feedback to the College and to the departments. The College hosts a "Dinner (now Zoom) with the Dean" that also includes College and departmental leadership every semester to have more casual dialogue and relationship building. We do solicit anonymous questions prior to these get-togethers, but if students are not comfortable raising certain issues during this forum, the Dean has communicated numerous times to the students that he has an open-door policy and that they are free to meet with him anytime he is available. This also holds true for other College and departmental leadership in being available for more personal and private discussions.



6 (p. 6)

The Dean's office and UH administration should continue to foster and support the research enterprise at CoE. Suggested ways to provide support include:

- *The Graduate Student support programs recommended above would free faculty to spend more time on technical aspects of their work including promoting research and having more capacity to accommodate more research.*
- *Establish a healthy and solid administrative support structure for pre- and post-awards. Free faculty from administrative burdens involved with grant writing so they can focus on the technical parts of proposals.*
- *Coordinate efforts across the College to target large research funding opportunities. Develop a platform to facilitate connections and collaboration (e.g. identifying potential collaborators for specific funding opportunities).*
- *Department Chairs and College Deans should ensure fair access to support by Junior Faculty.*
- *Provide incentives and support research excellence. Examples:*
 - *Manifest the buy-back of teaching time (reducing course load) via extramural funds when appropriate*
 - *System of communicating research efforts and recognitions.*

Graduate students are the gears behind the research enterprise. Evaluate financial support needs and provide competitive and life-sustaining compensation.

Consider seeding soft-money research and support positions to (continue the) kick-start of a thriving CoE research enterprise. Bring on personnel who are ultimately funded exclusively by extramural funds can develop into a self-sustaining system that feeds into faculty and student research efforts.

RESPONSE: Several of the recommendations have already been implemented since the review. Some of the administrative support shortcomings in the business office have been filled but it is important to point out that the College is far understaffed for administrative support for its level of activity and the size of faculty and student body as compared to the majority of other units and departments at the University. Some departments in other units at the University have more administrative support than the whole College of Engineering though the amount of students and research volumes are not commensurate in comparison. We do appreciate that the Review Committee has acknowledged this concern many times during their review as well as within their recommendations.

With that said, a new grants development specialist position has been created and filled (which has never existed at the College prior), and a new fiscal administrator is currently being recruited to fill one of two existing vacancies, all with the University's support and assistance. The College's interim associate dean has been tasked to provide more mentoring and guidance in proposal creation and submission while the assistant dean's office is providing more outreach and diversity inclusion proposals for broader grant agency acceptance. The College recently provided procurement and grant management training to all faculty and staff at the start of the Spring 2021 semester (100% attendance was achieved) and the College's resource webpage is being populated with more resources and documents for faculty to access to assist in the research development and management area. The College will also be automating many of the advising workload requirements through automated and easier accessibility efforts via standardizations of information. Advising videos will also be created to provide information.



Faculty time buyout to be more effective and efficient in research pursuits has always existed, and the College encourages these efforts as long as each department is able to sustain their teaching workload minimums; thus, much of these buyouts are left to the discretion of the department planning efforts and budgets. However, it is also the philosophy of the University and the College that faculty should also be active in instruction and that there must be a balance between instruction and research.

The College encourages departmental, college, university, and government/industry collaborations which can be seen by the numerous efforts in proposals being generated by many of the researchers in COVID related research, autonomy and robotics, broadband and 5G, material science, agricultural/green house, data science, medical, and other inter-related research arenas.

We would like to point out and remind that the College and the University does already provide very generous start-up packages to its newly hired faculty.

The College has also been extremely aggressive in pursuing larger scale research initiatives and collaborations with industry and other universities in very focused areas of interest to the State, including those disciplines mentioned above which is meant to directly benefit our faculty and graduate students by introducing and creating new opportunities with collaborators for research initiatives.

The College also agrees that more research personnel, especially that of administrative support, should be funded through extramural sources of funding which is dependent on faculty including these services and activities into their budget proposals. We will work with faculty to educate them on how to best incorporate such funding requests which in turn will better support their research activities and interest.

7 (p. 7)

Re-visit graduate-level course needs and teaching availability.

Explore potential for cross-college course offerings

Organize and collaborate on college-wide teaching initiative

Explore potential for collaborative teaching efforts with other schools/colleges

Encourage course cross-listings

RESPONSE: The College agrees with these recommendations and believes much of this is already on-going. Graduate course availability has always been an issue with the limited number of faculty, but as the College's faculty has grown, there has been more offering of graduate courses though we agree that our offerings must still be more robust. With the collaboration of programs, such as ME for Aerospace with Earth & Planetary Science, CEE for Sustainability with the Institute for Sustainability and Resilience, and EE for Computer Engineering with Information Computer Science, have generated senior level and graduate level projects and courses which are being cross-listed and taught by instructors outside of the College. We are continuously exploring course collaborations and hope the collaboration with CTAHR for the Bio/Agricultural Engineering and with HIGP for Material Science and Engineering will generate new courses. There are also renewed efforts in the innovation and entrepreneurial efforts in collaboration with NSIN (National



Security Innovation Network) on Lean Thinking Methodologies where discussions for introducing new research thinking utilizing multi solution, quick decision pathways. Some departments also utilize adjunct faculty from other units or from the private sector to help provide graduate course offerings.

The College is working with the departments to share in instructional responsibilities in courses that are required or offered by multiple departments in order to spread teaching workloads which is meant to free up more College faculty to develop and teach graduate level courses. We will also consider cross-listing of graduate courses from other units as an alternative to increase options for graduate students to take elective courses.

The new issue the College and its departments are facing has been the departure of several faculty members from ME and CE, coupled with the elimination of faculty positions from all three departments by the State Legislature and the hiring freeze imposed by the University on many of our faculty positions. At this point, our hope is to recover and receive authorization to recruit at least 3 or 4 of the 9 faculty positions lost. This, however, would still mean a tremendous loss for our graduate program in terms of reduced number of courses that can be offered and in research volume.

8 (p. 7)

Restore and expand administrative position counts as soon as is possible/practical.

Prioritize the health, efficiency and productivity of the administrative team (they are the engine behind the college).

Facilitate communication internally between administrative personnel, and also between faculty and administrative staff to curb disruptions to efficiency due to personality and expectation mismatch.

Look closely at administrative operations to make modifications (including training, reassignments, routing, etc) if and as would benefit the college. For example, consolidating/centralizing tasks assignments across units (e.g. GA hiring, travel completions, purchase orders etc) might be one way to help increase efficiency.

Exploring creative solutions may be necessary/productive in light of the current difficult budget climate (e.g. explore the potential for using "floater" support personnel, supporting administrative staff via extramural (and/or overhead) funds, sharing staff between units etc).

RESPONSE: We are in complete agreement with the importance and need of administrative support staff, and the College has already consolidated and/or reallocated responsibilities to align as efficiently as we possibly can so we do not envision any further changes to our organizational structure and roles and responsibilities. Unfortunately, many of the vacant positions have been swept or went vacant and frozen by the University. The College has been extremely fortunate to have received approval by the University to rehire a small number of our essential positions that became vacant due to retirements or voluntary separations. However, even with these hiring exemptions and our success in quickly filling those positions, our business office is still down net one FTE and our student advising office is down 67% compared to prior to COVID-19. This is exacerbating the difficulties of our business office to adequately support our faculty in grant submissions and expense processing as the College is not staffed adequately compared to the



amount of research activity and faculty and student counts. Delays in fiscal processing will continue to impact our faculty until the College is adequately staffed.

We would agree that administrative staff supported by extramural funds would be of significant help but as mentioned in a previous response, this is dependent on faculty to include such services and activities in their grant proposals and we will work with faculty to educate and train them on the mechanisms of doing so. Otherwise, the College is also willing to use its RTRF to support such additional positions should faculty research increase the amount of RTRF returned to the College through increased research funding much like the College has done in order to pay for the new grants development specialist position through the use of RTRF.

The College is also working to develop or purchase software to provide a tracking system so that the fiscal staff and faculty can more transparently track invoice processing and routing. We have also provided training to all faculty and staff for procurement and grant management at the beginning of the Spring 2021 semester which is intended to develop greater awareness and education for faculty and staff on their own responsibilities and submission requirements which is meant to help improve processing efficiencies as we find a significant amount of time spent by College fiscal staff is spent on making corrections to or filling in gaps for incomplete or incorrect submissions by faculty, staff and students.

9 (p. 8)

Ramp up graduate-student recruitment efforts (local and abroad).

Conduct college-wide, national-level marketing efforts for graduate programs.

Build branding, create a strong presence on social media for graduate programs.

Explore changes to improve national rankings.

Continue to boost the college research enterprise which will boost the national reputation of the college and attract top students.

RESPONSE: Various graduate recruiting efforts were planned for both the mainland and more so for the Asian countries (Japan, Korea, China, Singapore, Taiwan, Thailand, Vietnam, India, etc.) with specific researchers and faculty ties; however, these were all postponed due to COVID-19. The virtual interactions for specific researchers as well as maintenance of our MOUs with many of the international and domestic academic entities have continued and are present in the collaboration proposals being submitted (NSF AGEP, NSF INCLUDES, etc.).

The College's marketing and outreach director has been steadily progressing on the branding and theming of the College both internal and external facing and can be readily seen on our updated webpage (www.eng.hawaii.edu) and on various social media - FaceBook, LinkedIn, Instagram, Twitter, etc. The College's outreach presentations are also being standardized in appearance to clearly manifest that all the different programs are from the UHM College of Engineering.

The improvement in national ranking is a much more complex issue. One of the most important criterion for ranking is peer institution perception and industry opinion; thus, great efforts are being made to convey the College's achievements and efforts to our peer institutions via printed and virtual materials that has not been done by the College in the past, as well as, having our



faculty and researchers be more active in personally promoting the College during conferences, meeting, and gatherings. Many of our industry and government partners will be getting requests to complete surveys that will help us with our position.

The ME department has offered a few internal recruitment sessions during the Fall 2020 semester to encourage current undergraduate students to continue their education in the ME MS program here at the University. In addition, the EE graduate committee has been working on recruiting efforts including purchasing student information from GRE who achieved competitive scores and inviting such students to apply for EE graduate program through an email and postcard campaign. Currently, EE department website is being updated to also help with graduate recruitment.

We also agree that the research enterprise can have a significant influence on the College's ranking and reputation. The College has been very aggressive in engaging more research focus areas, funding sources, and new collaboration partners that the College has not engaged in the past. In Academic Year 19-20, the College secured \$17 million in grant awards and had \$10 million in research expenditures. For context, both numbers are historical records for the College with grant awards never having exceeded \$10 million.

10 (p. 8)

Improve alumni tracking efforts.

Institute a system of alumni program evaluation and feedback mechanisms.

Conduct exit interviews for CoE graduating graduate students to collect information on placement and to solicit feedback about and suggestions for the program.

Conduct employer surveys to identify areas of need and improvement.

Regularly update graduate alumni contact and placement data.

Strive to make assessment a regular and meaningful process. For example collect, process, and respond to program information in a way that feeds back into positive development for the programs.

RESPONSE: We agree that graduating student and alumni data is extremely important to the College and its sustainable success. To improve alumni tracking, the College has already been working closely with the EAAUH (Engineering Alumni Association of the University of Hawai'i) to combine efforts in automatically gather and request updates on alumni data. One effort has been to utilize two recent graduates who are members of EAAUH in creating an easy to access webpage and email address associated with UHM, so eaauh@hawaii.edu, to help gather and track information.

The College is also automating the data collection of 'exit reports' for graduating students as they attend the CoE Convocation well as UHM Commencement. A new exit report was requested of students for the past Fall 2020 graduates, and the College was able to obtain 100% for email addresses after graduation, but much less, for employment and contact phone numbers. All these information are now being stored in an internal College database to interact with our current alumni database as well as our current student databases. Once centralized, our data management will become much more efficient and effective.



The College is also very connected with industry and its employer partners and is a continued focus for College leadership. An employer survey has already been conducted recently through the College's involvement in the Engineering Sector Partnership with the Chamber of Commerce Hawaii and the University's P-20 program. Continued outreach and employers' survey would be beneficial to all stakeholders in this matter.

11 (p. 9)

Efforts to relieve the space constraints faced by CoE should continue with renewed energy and creativity with support from UH admin.

Assigning appropriate research lab space for faculty should be a priority. This is critical to the success and future of the faculty member (hence the department and college) and will support graduate student research and projects

CoE can/should consider addressing graduate student office availability and assignment at the college level and/or by working directly with departments to help/support the development of space and mechanisms for consolidated student offices. Centralizing student offices could be a more efficient use of space than relying on case-by-case assignments and will provide a productive and beneficial way to foster communication between students/labs and a supportive student environment.

RESPONSE: The College agrees with the recommendations related to facilities. The College is in long-term need of far greater amount of research lab space than is currently available from the University. However, in order to free up space for the College to continue to operate as best it can in the near-term, there has been significant effort by the College in cleaning up and optimizing use of existing space, consolidating uses, as well as working with the University on finding appropriate space for various researchers based on their specific needs outside of Holmes Hall and POST on a case by case basis. For example, Drs. Yi Zou, Tao Yan, and Tyler Ray were more suited for research in bio-related wet labs, so they have located to a different building with these capabilities. Some of our new faculty required filtered, clean labs, so the College is accommodating by creating more self-contained clean space by converting current lab space to contain these air filtration systems in a high end clean room. Greater evaluation and scrutiny will be given to space requests and allocations to properly fit the needs of the researchers.

Currently, the College is also consolidating the office space for student chapters of professional societies to a single location by giving them a common space (Holmes Hall 389A) in order to create more available space for research and faculty offices. There has been a couple of collaborative use teaching assistant office spaces developed, so these will continue with refurbishment and renovations.

12 (p. 9)

Foster and develop an entrepreneurial program for CoE graduate students, in collaboration with Shidler College of Business.

Recruit qualified, energetic, and entrepreneurial graduate students and faculty. Leverage BAM pathway.

Partner with supporters in industry to offer a college-wide graduate level course and programs on entrepreneurial endeavors in engineering.



RESPONSE: Besides the encouragement of faculty, staff, and students participating in Breakthrough Innovation Challenge (BIC), Business Plan Competition (BPC), and various innovation and accelerator challenges offered by our University and industry, we have now partnered on two new innovation and entrepreneurial initiatives. The first was co-founding the Innovation Impact Challenge (IIC) that is now spearheaded by the University's Office of Innovation and Commercialization (OIC). The second was to help lead the effort with OIC to introduce the NSIN program to provide H4D (Hack for Defense) and X-Force which revolves around generating innovative solutions to problems and not projects using the Lean Methodology to quickly assess potential solutions based on a variety of inputs. This will be used in the undergraduate and graduate levels to change the thinking of students to help generate new energized thinking. There have been partnerships with HECO, PHNSY, Hawaiian Telcom, and other local firms and agencies.

The College is also in conversation with the Shidler School of Business on re-engaging in an innovative ENG-BUS co-curriculum.

In addition, the College is launching starting February 19th a College of Engineering Leadership Seminar Series offered once a month during both Fall and Spring semesters where leaders from Hawaii's business community (both engineers and non-engineers) will be invited to speak to our students, faculty, and alumni about their challenges and obstacles they have faced in their lives and their views on leadership that involves skill sets that must be developed outside of the classroom and beyond what can be read in a book. Leaders already confirmed for Spring 21 and Fall 21 include Stanford Carr, Mayor Rick Blangiardi, Glen Kaneshige, Lance Wilhelm, Susan Yamada, Susan Eichor, Micah Kane, Lori Kahikina, Ed Sniffen, Keiki-Pua Dancil, Ka'iu Kimura, and Jennifer Sabbas.

13 (p. 10)

Aim to develop and foster college-wide interaction and collaboration. College-wide initiatives might include grant-writing sessions, joint (CoE wide) graduate-level courses, college-wide seminar series (possibly featuring CoE faculty and/or projects, or invited guest speakers).

Introduce common (cross-department) graduate course(s).

Establish and strengthen connections between faculty, cross departments, and cross colleges/schools.

Encourage faculty and student ownership of community-building, possibly by providing seed funds and/or other incentives.

Conduct a survey and/or otherwise solicit feedback and ideas regarding College climate and collaboration.

Encourage cooperating faculty membership between departments.

Incentivize and facilitate joint mentoring/advising for graduate students. Consider adopting/enhancing a system that allows for joint chairship on graduate student committees.

Create common spaces and events where graduate students and faculty can co-mingle with other units.



Encourage interaction between student professional groups / encourage grad students to join these.

RESPONSE: Some of these recommendations were answered in previous replies, and the College is continuing more collaboration with JABSOM, CTAHR, SOEST, Architecture, and as well as working on collaborations with Urban Planning in Social Sciences. There have also been several interdisciplinary efforts to bring faculty together across units such as the College's REIS initiative and our biomedical engineering program proposal. We also have faculty who serve as cooperating faculty between departments internal to the College which helps further enhance collaboration between departments. However, it is difficult to sustain such initiatives without substantial support from the University, as faculty often undertake these initiatives in addition to their regular workload requirements for teaching, research, and service.

DEPARTMENT-LEVEL RECOMMENDATIONS

Civil and Environmental Engineering Specific Recommendations

CEE 1 (p. 11)

- *Recruiting is one area that appeared to be able to have more focus on. The recently instituted BAM program helps with MS recruitment but the PhD recruiting program was cited as lacking. Students also noted the lack of recruitment efforts as an undergraduate. A discouragement, possibly, to recruiting is the recent Board of Licensing to disallow the MS degree 1-year experience credit if it occurred while the candidate was fully employed.*
- *Providing Student Collaboration Opportunities: Provide a mechanism /area where graduate students can connect, especially the PhD students.*
- *Providing Guest Speaker Resources:*
 - *Possibly 2X/semester*
 - *Dr. Lum suggested collaborating with private sector whom regularly bring in specialized personnel that could provide speaking services on the same travel itinerary, thereby reducing speaker costs significantly.*
- *Some Faculty needs were noted as nice to have:*
 - *Teaching Assistant for graduate classes.*
 - *Technical support for labs.*

RESPONSE: We agree with many of the recommendations. Some of the previous responses in the preceding parts of this memorandum above address many of these recommendations. We will consider implementation of many these suggestions; however, much of that possibility solely depends on the availability of funding from the University and the Legislature.



Electrical Engineering Specific Recommendations

EE 1 (p. 12)

The department should place more emphasis on winning extramural research awards. The resources resulting from extramural funding are critical in a budget-constrained environment, and a significant portion of the funding is largely under the discretion of the department and college.

To support the faculty in attracting extramural research funding, the college and department needs to invest the proceeds of the funding, including the portion that goes into the so-called Research and Training Revolving Fund (RTRF), to provide support for the faculty in terms of staffing, attracting high-quality graduate students, and improving facilities & equipment. The reviewers recognize that there are limitations to how the funding can be used, and creative methods to use available funds may have to be developed. A review of how such resources are currently being used, and how they might be better leveraged, is recommended.

The college and department should explore ways to improve the department's national rankings, to help recruit high-quality graduate students and improve chances of winning extramural awards. Factors that are part of the ranking methodologies should be examined for improved scoring, including but not limited to: faculty size, research activity, student/graduate/industry assessments, student-to-faculty ratios, etc.

The EE Department's graduate program website should be reviewed, updated, and improved to enhance outreach and recruiting of faculty and graduate students.

RESPONSE: We agree and think that encouraging more collaborative interdisciplinary research and proposal development involving both junior and senior faculty would help. In addition, connecting the faculty with various funding opportunities from both the government and the industry should be helpful. The College has recently made significant efforts in this direction, which we think should continue and expand, if possible. Needless to say that sufficient administrative support is also crucial considering the College is understaffed to support even the current amount of research activity. Any increase in research activity would only continue to exacerbate the delays in fiscal processing which in turn impacts faculty and the College's research enterprise if additional staffing resources are not provided by the University or through other means.

Hiring new faculty in cutting edge research areas would also help both in terms of increased funding as well as in terms of increasing the Department's national rankings. The EE department at UH is one of the smallest among its national peer EE departments as a typical EE department in the US would have a significantly larger faculty size. It would be difficult to significantly increase the national rankings without increasing the size of the faculty.

The EE department website is currently being modernized with emphasis on active research areas, in part, to increase the visibility of EE graduate research and to attract more highly qualified research students. The EE graduate program has also introduced improvements such as updating the Systems track to Systems and Data Science (SDS) by modernizing its content and reviving image processing and computer vision courses. The EE department has also taken initiatives to recruit more graduate students through buying student information from GRE who



achieved competitive scores and a direct email/mail campaign, but more needs to be done, not just for the EE department but by all College departments.

EE 2 (p. 13)

The college and department should encourage and support faculty to increase grant applications to continue the growth in extramural research funding.

The college and department should foster inter-departmental and inter-college collaborations to inspire novel and innovative solutions that will lead to funding. In particular, collaborations with the Shidler School of Business will be important for entrepreneurship.

As faculty succeed in winning grants, the college and department needs to continue to support the growth by providing administrative help, increasing the number of faculty, and recruit qualified graduate students to perform the research.

RESPONSE: We agree and our comments above apply here too, in particular, the need for additional staff support resources from the University.

EE 3 (p. 13)

The college and university administration should continue to expand and improve facilities for faculty and graduate students.

Optimize available resources through improved collaboration and sharing within the department as well as with other CoE departments. There will be an added benefit of faculty and graduate student co-mingling that may boost collaboration that will lead to more extramural funding.

Establish common spaces for graduate students to interact, both within the department and with other departments. Shared office space, common areas for lunch and leisure, and shared labs are some recommendations to consider, among others.

RESPONSE: We agree that more space and shared areas and increased interaction among graduate students would be very helpful. Unfortunately, space and funding constraints provide challenges to such concepts. As to expanding and improving facilities, the College is investing a majority of its discretionary research budget into the creation of a top of the line clean room facility which will allow for more research opportunities for both EE and ME faculty that currently are not possible in the current facility. This improvement is intended to increase research funding levels.

EE 4 (p. 14)

Most graduate students rely on their faculty advisors for help with student issues. While faculty are expected to advise their graduate students on academic and programmatic issues, they may not have enough time, experience or knowledge for many of their other issues. We recommend that the college establish a staff position that is responsible for graduate student advocacy. Advocacy would include directing students to available on-campus resources as well as advice on graduate student life and living/working in Hawaii and the U.S. This support is especially important for international graduate students, who often have additional legal issues to navigate.



Because it may not be feasible to hire additional staff, we recommend making updates and improvements to the department handbook that may help graduate students to manage commonly encountered issues.

We also recommend that the department/college consider setting up a type of online information depository, like a 'wiki', for graduate students to document and share how they have resolved broader student-life issues that they have encountered.

Graduate student financial support levels in the form of TA-ships and GA-ships should be reviewed in relation to the cost of living in Honolulu. Several graduate students have to take on full-time jobs or seek public assistance to survive financially.

Available on-campus resources (e.g., counseling) should be reviewed for access and adequacy. Graduate students have reported that attempts at seeking on-campus assistance have been unproductive.

RESPONSE: We agree and responses above are applicable to these recommendations as well.

EE 5 (p. 14)

Work with the VCAFO to identify support staff who can temporarily be re-assigned to provide focused support to the department, or "float" between departments and colleges to support.

Develop creative uses of extramural funding, directly or via the RTRF, to shore up support. For example, larger multi-year grants may be able to afford a dedicated technical support staff person to handle invoicing and other project management activities.

RESPONSE: We agree additional support staff is necessary for the health of the department and the College.

EE 6 (p. 15)

Create shared office spaces and common areas to promote intra-departmental and inter-departmental interactions and collaborations.

Develop co-listed graduate-level courses to promote cross-departmental and cross-college interactions. This will also address the lack of available graduate courses that some students have identified as an issue.

Develop mechanisms to connect EE graduate students to the UH business school, to promote entrepreneurship, for example, participating at the Shidler Business Plan competition.

RESPONSE: Responses from above apply to these recommendations as well.

In addition, EE-MS students are required to take one or two elective courses depending on they pursue the thesis or non-thesis options. These elective courses can be fulfilled by any 400 or higher level course in engineering, natural sciences, SOEST, business, (or even from other programs with approval). We can encourage EE-MS students to take these elective courses from the other engineering programs (e.g. ME, CEE) or from the business school to promote entrepreneurship.



Mechanical Engineering Specific Recommendations

ME 1 (p. 15)

With growth curves now relatively stabilized, faculty are now better positioned to re-focus on their research and on graduate programs; faculty should be fully supported as they re-energize the research enterprise. See CoE recommendations on “Research Enterprise”.

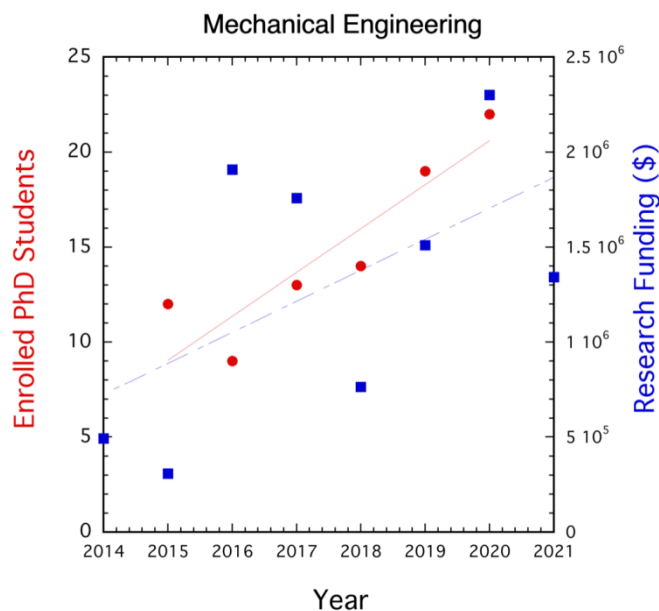
Growth in institutional support must follow growth in enrollments and faculty body but they have not kept up. See CoE recommendations on “Administrative Support”.

Capitalize on the recent increase in faculty count, which shifts ME toward the critical mass required to target large collaborative extramural funding opportunities. Facilitate collaboration and communication between ME and CoE personnel in this direction. Provide opportunities and incentives for faculty to contribute to and participate in large research initiatives. See CoE recommendations on “Research Enterprise”.

Encourage/incentivize faculty to include student RA support in grants & awards.

RESPONSE: Responses above apply to these recommendations as well, especially the fact that additional support staff is necessary for the health of the department and the College. It should be noted that two ME faculty recently resigned and the department believes priority should be given to recruit for their replacements.

Faculty are encouraged to generate funding for graduate students as the department’s tenure-and-promotion criteria allocates more credit for funding used to support graduate students compared funding to support post docs, etc. Research funding and PhD students has been steadily increasing in the last several years.





ME 2 (p. 16)

UHM Administration, CoE leadership, and others units across campus should work together to evaluate the potential for continued growth (and possible branching) in ME. Considerations should prioritize the wellbeing of current faculty and programs while considering topics missing/lacking at UHM and of need to the State of Hawaii. Growth and restructuring should be met with institutional support (space, administrative, faculty counts...).

Prioritize continued emphasis on relationships and collaborations, including joint research and teaching programs, with related personnel/units across campus (including CNS, CTAHR, SOEST, the School of Medicine).

RESPONSE: We agree and responses above are applicable to these recommendations as well. Mechanical Engineering encompasses a broad range of areas that are of interest to the University as well as the State; hence, a significant amount of activity is in progress to formalize these into educational programs. The ME department is currently seeking approval to move the Aerospace Engineering concentration from CoE's Engineering Science into the ME department. The Aerospace Engineering concentration in ME will also incorporate SOEST's Earth and Planetary Exploration Technology (EPET) certificate program into the ME Aerospace Engineering curriculum. The ME department is also working on a Biomedical Engineering concentration, and looking into developing a Material Science and Engineering concentration. A Material Science and Engineering steering committee was recently formed by Dean Morioka (CoE) and Dean Taylor (SOEST) to look into developing a Material Science and Engineering concentration within ME; developing a Material Science certificate program for the University; coordinating/categorizing materials research across campus; and developing core graduate courses in materials to benefit graduate students across the campus. The College is also working with Ocean Engineering to develop a concentration in the College's Engineering Science, but aspects of exploration technologies can have strong interactions within the ME and CEE departments.

ME 3 (p. 16)

Revisit the training and access procedures and revise/update as needed to streamline access.

Space and facilities are a critical need for ME. See CoE recommendations for "Facilities"

RESPONSE: We agree and responses above are applicable to these recommendations as well.

ME 4 (p. 16)

A graduate student advocate for the College would give students a central contact for process and general questions. See CoE recommendations for "Graduate Student Support"

The positive effects of the recent appointment of a permanent Dean have precipitated positive change and progress, and a sense of direction and continuity for the students. A regular Chair will have a similar effect; the ME department needs a full-time regular Chair. While recognizing and acknowledging the dedication and accomplishments of the interim ME chairs, we recommend that UH Administration



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prioritize the (frozen) ME senior faculty member (potentially Chair) position/recruitment as soon as possible.

Update the graduate student manual and update it on a regular basis (every couple years and/or with any major program changes). Make readily accessible and available online.

RESPONSE: We agree and responses above are applicable to these recommendations as well.

ME 5 (p. 17)

Offer graduate level ME courses as faculty time/availability permits.

Consider joint, cross-listed, or co-taught courses with other departments in CoE. This could broaden the graduate class availability and encourage cross-department and cross-college interaction, while maintaining sustainable faculty teaching loads.

See CoE recommendations on "Teaching".

RESPONSE: We agree and responses above are applicable to these recommendations as well. Over the last several years, the ME department has grown its Cooperating Graduate Faculty to sixteen (16) faculty/researchers across the campus. If, for example, the Cooperating Graduate Faculty were allowed to teach one course every two years, that could add eight (8) graduate courses/year to alleviate the shortage of graduate classes. Coordinating with the ME department on graduate topics that should be offered would be a win-win situation.