

## College of Engineering

### College of Engineering

Context: We are contemplating a major expansion of the College.

#### *Summary of Recommendations*

- Reorganize the Computer Science faculty and programs from the College of Natural Sciences to the College of Engineering.
- Move Computer Engineering faculty and program from Electrical Engineering to new Department of Computer Science & Engineering.
- Develop recruitment strategy for Construction Engineering and Engineering Science. Work with the UHCCs to increase awareness of the new degrees.
- Implement the recommendations from the external review of Computer Engineering/Computer Sciences (prioritizing modification of the CS undergraduate programs).

#### *Details*

- The College of Engineering currently offers the BS, MS, and PhD degrees in Civil Engineering, Electrical Engineering, and Mechanical Engineering; and BS degrees in Computer Engineering, Construction Engineering, and Engineering Science.
- With the recommended changes, the size of the College will grow considerably.

	<b>Current Organization*</b>	<b>Proposed Organization</b>
<b>Programs</b>	<ul style="list-style-type: none"><li>• Civil Engineering (BS, MS, PhD)</li><li>• Computer Engineering (BS)</li><li>• Construction Engineering (BS)</li><li>• Electrical Engineering (BS, MS, PhD)</li><li>• Engineering Science (BS)</li><li>• Mechanical Engineering (BS, MS, PhD)</li><li>• Renewable Energy &amp; Island Sustainability (Grad Cert)</li></ul>	<ul style="list-style-type: none"><li>• Civil Engineering (BS, MS, PhD)</li><li>• Computer Engineering (BS)</li><li>• Computer Science (BS, MS, PhD)</li><li>• Construction Engineering (BS)</li><li>• Electrical Engineering (BS, MS, PhD)</li><li>• Engineering Science (BS)</li><li>• Information &amp; Computer Science (BA)</li><li>• Mechanical Engineering (BS, MS, PhD)</li><li>• Renewable Energy &amp; Island Sustainability (Grad Cert)</li></ul>

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### Department of Civil & Environmental Engineering

#### *Summary Recommendations*

- Recommend the development of a recruitment strategy for the BS in Construction Engineering.
- Work with the UH community colleges to increase awareness of the new BS Construction Engineering

#### *Details*

- The Department offers the BS, MS and PhD in Civil Engineering, and the recently approved BS in Construction Engineering. A combined degree pathway is available as well. The Dept. has 15.33 tenure-track faculty FTE, down from 17.21 in 2014.
- There are 266 enrolled in the BS in Civil Engineering (down from 300 in 2012), 7 enrolled in the new BS in Construction Engineering, 51 enrolled in the Master's, and 17 enrolled in the PhD Program. Enrollment in the graduate programs has remained steady.
- The College of Engineering is successful in attracting transfer students from the UHCCs through their articulation agreement. Recommend the Department work with the UH Community Colleges to increase awareness of the recently approved BS in Construction Engineering.
- The graduate programs are scheduled for review in Fall 2020.

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### Department of Electrical Engineering

#### *Summary Recommendations*

- Move Computer Engineering faculty and program from Electrical Engineering to new Department of Computer Science & Engineering

#### *Details*

- The Department of Electrical Engineering offers the BS, MS, and PhD in Electrical Engineering, and the BS in Computer Engineering. The undergraduate degrees are accredited by ABET. The department offers successful combined degree pathways for the BS Computer Engineering/MS Electrical Engineering, and BS/MS Electrical Engineering.
- There are 100 enrolled in the BS in Computer Engineering, 216 enrolled in the BS in Electrical Engineering (down from 272 in 2012), 35 in the MS, and 17 in the PhD program.
- Creating a Computer Science and Engineering Department was one of 4 options recommended by the external team charged with reviewing the Computer Science and Computer Engineering programs.

The graduate programs in Electrical Engineering are scheduled for review in Fall 2020.

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### Information & Computer Sciences → Computer Science & Engineering

#### *Summary Recommendations*

- Reorganize the Computer Science faculty and programs to the College of Engineering.
- Move Computer Engineering faculty and program from Electrical Engineering to new Department of Computer Science & Engineering.
- Apply the Engineering program fee to the Computer Science undergraduate program(s).
- Recruit faculty with a “practical orientation” to teach across Computer Engineering and Computer Science programs.
- Implement the recommendations from the external review of Computer Engineering/Computer Sciences (prioritizing modification of the CS undergraduate programs).

#### *Details*

- The Department of Information and Computer Science offers the BA in Information and Computer Science; BS, MS, and PhD in Computer Science; and the Master of Library and Information Science. Recommend the faculty and program in Library and Information Science be moved to the School of Communications (Social Sciences), or to a unit in the College of Education (see discussion under the School of Communications). The department offers two combined degree pathway programs: the BS/MS in Computer Science and BA Information and Computer Science/MLISc.
- The Department of Electrical Engineering offers the BS in Computer Engineering, accredited by ABET. The department offers a combined degree pathway for the BS Computer Engineering/MS Electrical Engineering.
- There are 93 students enrolled in the BA in ICS, 420 in the BS in Computer Science (up from 223 in 2012), 35 in the MS, and 18 in the PhD program. There are 100 enrolled in the BS in Computer Engineering.
- Creating a Computer Science and Engineering Department was one of 4 options recommended by the external team charged with reviewing the Computer Science and Computer Engineering programs.
- Selected recommendations for the undergraduate programs are summarized below.

#### Computer Science Programs

- Modify the content of courses so that the undergraduate program produces students who are prepared to work as software developers.

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- Merge ICS courses with corresponding Computer Engineering courses – courses such as algorithms and operating systems – so that there is a single course, taught in the same way alternately by faculty from each program. Adopt the Computer Engineering approach to these courses.
- Establish an Advisory Board which periodically reviews the program curriculum, among other things, and identifies gaps and recommends changes to ensure graduates meet the needs of employers. Members of the Advisory Board could come from local industrial as well as non-industrial employers.
- Ensure that all tenure-track faculty feel responsibility for the undergraduate program, so that the courses fit together to address the educational objectives, and so that a fair and appropriate balance of teaching responsibility across all faculty is achieved.

### Computer Engineering Program

- This program is considerably under-resourced in terms of faculty.
- Look for opportunities to connect with HI-DSI and other areas on campus. There may be opportunities to better connect the Data Science activities across campus through joint seminars or joint proposals.

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### Department of Mechanical Engineering

#### *Summary Recommendations*

- Ensure program information for the BS in Engineering Science is available in the Catalog.
- Work with the UH community colleges to increase awareness of the new BS in Engineering Science.

#### *Details*

- The Department of Mechanical Engineering offers the BS, MS and PhD in Mechanical Engineering, and the recently approved BS in Engineering Science (with concentrations in Aerospace Engineering and Biomedical Engineering). The Department has a very successful combined BS/MS pathway.
- There are 320 enrolled in the BS in ME, 23 enrolled in the master's and 19 enrolled in the PhD program. There are only 4 enrolled in the BS in Engineering Science.
- The College of Engineering is successful in attracting transfer students from the UHCCs through their articulation agreement. Recommend the Department work with the UH Community Colleges to increase awareness of the recently approved BS in Engineering Science.
- Program information for Engineering Science is not available in the Catalog, which is unfortunate. The Department needs to develop a marketing and recruitment strategy for this program, especially the tracks in Biomedical and Aerospace Engineering.
- The graduate programs are scheduled for review in Fall 2020.