November 9, 2011

To: Reed Dasenbrock, VCAA

Via: Peter Crouch, Dean 

Fr: Bruce Liebert 

Re: One-Year Progress Report on Accreditation Issues, Supplemental Report

In response to your memo of October 31, 2011 requesting an expansion of our previous report submitted September 15, 2011, please see the following response from the College of Engineering.
One-Year Progress Report on Accreditation Issues, Supplemental Report

Institutional Concerns Expressed by ABET

The ABET review occurred in the Fall of 2009, and the final report was delivered to the University in the Summer of 2010. Some overall concerns were expressed by ABET about the fiscal/resource base of the College going forward. To address these concerns we tabulate some of the base statistics that cover the period of since 2006 with focus on the period Fall 2009 to Fall 2011.

Student Faculty Ratios

<table>
<thead>
<tr>
<th>Student/Faculty ratio</th>
<th>Fall 2011</th>
<th>Fall 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Undergrad</td>
<td>Undergrad &amp; Grad</td>
</tr>
<tr>
<td>EE Department</td>
<td>15.8</td>
<td>19.5</td>
</tr>
<tr>
<td>CEE Department</td>
<td>17.7</td>
<td>22.6</td>
</tr>
<tr>
<td>ME Department</td>
<td>17.1</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Headcount Students

<table>
<thead>
<tr>
<th>Headcount students</th>
<th>Fall 2011</th>
<th>Fall 2009</th>
<th>Fall 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UG</td>
<td>Grads</td>
<td>Total</td>
</tr>
<tr>
<td>EE Department</td>
<td>284</td>
<td>67</td>
<td>311</td>
</tr>
<tr>
<td>CEE Department</td>
<td>292</td>
<td>81</td>
<td>373</td>
</tr>
<tr>
<td>ME Department</td>
<td>240</td>
<td>45</td>
<td>285</td>
</tr>
</tbody>
</table>
FTE Faculty

<table>
<thead>
<tr>
<th></th>
<th>Faculty Leaving the College since 2006</th>
<th>Net New Faculty Joining the College since 2006</th>
<th>Change in Faculty numbers since 2006</th>
<th>Total FTE Faculty in Fall 2011</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE Dept.</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>18</td>
<td>Does not count 2 HCAC faculty who sometimes teach in EE</td>
</tr>
<tr>
<td>CEE Dept.</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>16.5</td>
<td>3 faculty shared with WRRC</td>
</tr>
<tr>
<td>ME Dept.</td>
<td>6</td>
<td>7</td>
<td>+1</td>
<td>14</td>
<td>Does not count the current AA Dean</td>
</tr>
</tbody>
</table>

Staff Counts*

<table>
<thead>
<tr>
<th></th>
<th>Fall 2011</th>
<th>Fall 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Secretary</td>
<td>Fiscal/Admin</td>
</tr>
<tr>
<td>EE Dept.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>CEE Dept.</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ME Dept.</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Dean’s Office</td>
<td>3</td>
<td>6.5</td>
</tr>
</tbody>
</table>

*Does not include exec/managerial/S faculty in the Dean’s office that have not changed since Fall 2009.

Overall College Assessment of Resources

Despite the financial cuts that were made in 2008/2009, the College personnel levels, in terms of both staff and faculty, have remained largely constant. The budget cuts basically affected the ability to hire new faculty and staff, and the amount of operating funds that the College enjoyed. Assuming that the College is not hit by significant additional budget cuts, the personnel levels of the college should be no worse than when ABET came in Fall 2009.
When the ABET review was performed in 2009 the College was not yet receiving the funds from
the professional fees levied on the sophomore – senior students. These funds have now begun
coming into the College and the units are in the process of spending their second round of funds.
These funds, which amount to ~$150K per unit, are very substantial and mitigate many if not all
the concerns expressed in the ABET report. In particular, some of these funds can be directed at
the cost of technician support to the units and some units are using this flexibility. (This
compensates for the loss in technician support in two departments). These funds also mitigate, to
some extent, the loss of operating funds to the units that had been used to purchase equipment for
the undergraduate labs.

In Spring 2011 the College received additional funds for two more APT positions. One of these
positions was used to support the increased advising that will arise due to taking on the pre-
engineering students, who are not covered by ABET. However, another of the positions is being
used as an additional fiscal person in the Dean’s office who now works on the fiscal issues
relating to the two units, ME and EE, that lost fiscal clerical support since 2008 and was of some
concern to the units in the ABET review.

Specific Program Institutional Support Concerns

Civil Engineering Program
Support Criteria: No specific concerns, but concerns about the future in case of additional
budget cuts. Addressed by the “Overall College Assessment of Resources”. In particular, CEE
uses the professional fees to support an additional technician.

Electrical Engineering Program
Support Criteria: Specific concerns about the budget shortfalls for laboratory equipment and
staff levels. Addressed by the “Overall College Assessment of Resources”. In particular, the
professional fees address the laboratory funding concerns and the loss of the fiscal/clerical
person in the department has been mitigated by the 50% FTE Fiscal person in the Dean’s office
devoted to EE.

Mechanical Engineering Program
Support Criteria: Concerns about the future in case of additional budget cuts. Addressed by the
“Overall College Assessment of Resources”. There were specific concerns about the salary
levels in the ME department. Indeed the Dean has studied the salary deficiencies for the College
faculty at great length. It is the case that faculty who stay at UH for many years are less well
paid, for equal performance, at other institutions as measured by the ASEE salary studies.
However, ME faculty are slightly better paid than the CEE faculty because in general the CEE
faculty enjoy more years of service than the ME faculty. Clearly if there is a time when there is a
mechanism and funding available to the Dean to make deserved merit and equity increases for all
the College faculty, he will be ready to do so, and is equipped with ASEE benchmark data from
which to make the allocations.

Faculty Criterion: Specific concerns that there are sufficient faculty to teach the number of
students in the program. The ME program is the only program to have gained faculty since
2006, and indeed since the Fall of 2009 when the department had 13 faculty, although the department has gained just one in number despite fairly aggressive faculty hiring and searching. The student/faculty ratio for undergraduates is still less than the CEE program and there are many institutions where the student faculty ratio is far greater than 17:1.

Specific Program Assessment Concerns

ABET identifies four ranges of compliance or non-compliance with the accreditation criteria: Deficiency, Weakness, Concern, and Observation. Of the three engineering programs in the College of Engineering, ABET identified eight unresolved Concerns (four of which are related to Institutional support, as discussed above) and two Observations. The remaining Concerns and Observations are discussed below.

Civil Engineering Program
Assessment Criteria: Concerns about Program Outcomes
"The information that was provided was not adequate for determining the degree to which these program outcomes are attained for the following outcomes: (h) a broad education necessary to understand the impact of engineering solutions in a global, economic, societal, and environmental context; (i) recognition of the need for and ability to engage in life-long learning; and g) knowledge of contemporary issues."

This concern has been addressed by identifying additional courses to assess these outcomes and assigning specific faculty members to each outcome in order to ensure that the process and schedule for that outcome is followed.

Assessment Criteria: Concerns about Program Criteria
"The program criteria for civil and similarly named engineering programs require that the program demonstrate that the graduates can explain basic concepts in management, business, public policy, and leadership. While these topics are listed and/or mentioned in one or more courses, the program has not provided evidence that graduates can explain these concepts."

This concern has been resolved since it is no longer a requirement that programs need to demonstrate that graduates can explain the basic concepts mentioned above.

Electrical Engineering Program
Assessment Criteria: Concerns about Program Outcomes
"The program outcomes and associated assessment and evaluation processes do not specifically address the students' ability to 1) design an experiment, 2) design a system to meet multiple realistic constraints, and 3) understand the economic and environmental impact of engineering solutions."

1) Design an Experiment. This concern has been addressed recently by including design of experiments in the new rubric system; however, insufficient data exists at the present time to evaluate this outcome.
2) Design a system and 3) Understand the economic and environmental impact of engineering solutions. These concerns have been addressed by modifying outcomes 3 and 8 and including direct measures by assigning undergraduate courses for assessment.

Progress on addressing this concern is not sufficiently developed at this time to provide feedback for evaluation. Thus, this concern remains unresolved.

Assessment Criteria: Program Observation
“The program has chosen some program educational objectives that may be difficult to assess.”

One PEO has been dropped and moved to the mission statement. The program relies on its industry advisory board and alumni to determine the appropriate PEOs. It remains to be seen if some PEOs will prove to be difficult to assess. This Observation remains unresolved.

Mechanical Engineering Program
Assessment Criteria: Concerns about Program Outcomes
“Criterion 3 requires that there be an assessment and evaluation process that periodically documents and demonstrates the degree to which the program outcomes are attained. Some rubrics have not been developed or implemented.”

Rubrics have now been developed and implemented allowing their use in the assessment and evaluation process to close the loop; however, the degree to which the program outcomes are attained is in progress. This Observation remains unresolved.

Assessment Criteria: Program Observation
“Clearer documentation of the continuous improvement process…would strengthen the program’s demonstration of its process.”

The program has worked on improving documentation of specific details of improvements, as well as documenting specific dates of activities and actions taken, as suggested in this Observation.

Summary

It is believed that the College and programs remain very viable with ABET accredited programs, and in particular since the ABET visit in the Fall of 2009, the fiscal situation is somewhat better. The level of the budget cuts of concern to ABET did not affect the actual staffing levels greatly, but this has greatly decreased the fiscal flexibility that the College enjoyed and so the continuing aspirations of departments and faculty have to get back to faculty and staff levels and aspirations before the budget cuts are probably unjustified.

This year the College enrolled more than 40 more students than last year and is over 1000 total undergrad and grad students for many years. It is hoped that these increases are not transitory and that the College will indeed receive financial gain through these additional students so that some of the expectations can indeed be met.
Plans to Accredit the Computer Engineering Program
Before we can request accreditation for a new program from ABET, there must have been at least one graduate in the program. We anticipate this will occur either in 2013 or 2014. Because our next General Review for all of the other five engineering programs will be in the Fall of 2015, it makes sense to apply for initial accreditation in computer engineering at the same time. Fortunately, there is a provision in the ABET Accreditation Policy and Procedure Manual, Section II.G.7, that covers this situation; namely, we are allowed to request a two-year retroaction for computer engineering at the time of our next General Review in 2015.

II.G.7.a. An institution may wish to delay the accreditation review of a new program by one year to coincide with a scheduled general review of other accredited programs in the same commission. Under those circumstances ABET will consider extending accreditation of the new program retroactively to encompass two academic year(s) prior to the academic year in which the on-site review was conducted. The following additional information must be provided to the review team:
II.G.7.a.(1) Documentation in the Self-Study Report that no substantive curricular changes have occurred during the two academic years prior to that of the initial review.
II.G.7.a.(2) Transcripts and sample student work for both academic years prior to that of the initial review.

As we prepare for our next General Review, those components of computer engineering that are unique to this program have been, and will continue to be, assessed to comply with ABET's requirement of continuous improvement, in addition to the common components shared with electrical engineering.