Findings of the Implementation Committee for SEEBME Restructuring

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I. Executive Summary

The SEEBME Restructuring Committee (SRC) was given four charges (re-ordered for this analysis):

1. Understand the need for and provide academic content that is necessary for individual programs; consider how synergies can be created to make each program stronger; apply all conclusions to majors at both undergraduate and graduate levels. This analysis should be done within the framework of preparing our students to meet future technological needs (i.e. Grand Challenges) not with a view to preserving the status quo.

2. Determine how opportunities for collaboration on education and research across school lines can be enhanced and to establish an academic framework to support interdisciplinary instruction across the college.

3. Explore how SEEBME can maintain vital connections across College lines and with community and government organizations (such as EPA) to create broader opportunities for research and education.

4. Reduce undergraduate programs to a number consistent with the level of available resources, including faculty and high quality students.

To address these charges, the SRC designed and conducted two on-line faculty surveys aimed at identifying and understanding the current synergies and future trends for SEEBME faculty collaborations in education and research. The surveys were designed to discover links among the four SEEBME programs, links between SEEBME and the six other Schools housed in CEAS and links between SEEBME and eleven other Colleges across the UC campus.

Both surveys revealed significant synergies and insightful trends between:

- CHE and ENVE
- BME and College of Medicine
- Materials Science Engineering and programs in CEAS schools
- Energy and programs in CEAS schools

Therefore, to capitalize on these synergies and address the four charges given to the committee by Dean Montemagno, the SRC proposes the following new college structure forming:

- School of CHE and ENVE
- School of Bioengineering housing BME and future BioE programs
- College-wide graduate level Energy Institute
- College-wide graduate level Materials Institute

II. Methods

On February 21, 2011, Dean Montemagno tasked the SRC with four charges. The SRC met at least once weekly with additional meetings by two subcommittees assigned to address
separate parts of the charge. Specifically, one SRC subcommittee focused internally within SEEBME on Charge 1 (above) and the other SRC subcommittee focused externally on SEEMBE’s relationships with other schools in CEAS (Charge 2) and with other colleges and government and community organizations (Charge 3).

The SRC initially proposed that the Center for Economic Education (CEE) in the College of Business conduct a study of demand for SEEBME graduates. The CEE had previously conducted a similar study when the Department of Biomedical Engineering was formed in 2001. Their analysis at this time could also provide valuable information about the market and about future trends in SEEBME thrust areas. The SRC met twice with Dr. Vredeveld and Dr. Rexhausen who proposed to conduct the study. The SRC concluded that Charge 4 (above) required more information which was beyond the scope of the committee’s responsibilities before a demand analysis could be conducted. The Dean also hoped to obtain support from the Provost to conduct the analysis but the Provost indicated that this analysis could be conducted within CEAS. Thus, this suggestion to hire the CEE group is tabled at the current time.

To address the first charge about within-school interactions, the SRC conducted an online survey using the web-base application, Survey Monkey. The program chairs in biomedical engineering, chemical engineering, energy and materials engineering, and environmental engineering were first polled to determine the four-to-five subdisciplines within each program. All SEEBME professors were assigned to programs based on their primary appointments. A “bubble map” was then created where all subdisciplines and primary faculty were graphed against themselves to determine degrees of interaction. March 30th, all SEEBME professors were asked to fill out the on-line survey to determine the percentage of time that each member dedicated to each subdiscipline (Actual survey in Appendix). The faculty was asked to provide these percentages based on current activity and where they expect their research time to be allocated in the next 3-5 years. The resulting bubble map (Figures 1 and 2) shows the within-program and cross-program interactions for the programs and sub-disciplines. The conclusions and recommendations are also bulleted. A total of 39 SEEBME faculty responses were included in the first survey.

A second on-line survey was then performed to address the second charge regarding interactions between SEEBME faculty and those in other CEAS schools as well as the first part of the third charge to address cross-college interactions (Actual survey in Appendix). SEEBME faculty members were again polled on April 14 to determine current interactions and interactions that were expected to occur in the next 3-5 years. The first set of graphs (Figures 3, 4 and 5) show the percentages of current and future activity between SEEBME faculty and those in other CEAS schools. The second set of graphs (Figures 6, 7 and 8) reveal the weighted percent average of activity of the SEEBME programs with the other eleven UC Colleges (Medicine, Business, DAAP, etc.). Additionally, this cross-college activity by faculty in the four SEEBME programs is shown. A total of 33 faculty responses were included in the second on-line survey. Statistical “t” tests were conducted using percentages from current vs. future data to determine significant temporal changes for the school and its programs.
Response percentages by individual program are detailed in the following table.

<table>
<thead>
<tr>
<th>Program</th>
<th># of Faculty</th>
<th>% Responded to Survey 1</th>
<th>% Responded to Survey 2</th>
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<td>69</td>
<td>56</td>
</tr>
<tr>
<td>CHE</td>
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<td>64</td>
<td>43</td>
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<td>EME</td>
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<td>44</td>
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<tr>
<td>ENVE</td>
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<td>92</td>
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<tr>
<td>Total</td>
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<td>66</td>
<td>56</td>
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</table>

The SRC members then discussed “ideal” cross-program, cross-school, and cross-college interactions in the future. These ideal percentages were based on broader developments that were likely to affect their disciplines. Examples included the need to interact with the College of Business for marketing of new discoveries, the need for more comprehensive planning analysis by DAAP, and legal consequences of actions in the field with assistance of the College of Law. While these levels of ideal interactions are not precise and are specified in this report without broader faculty input, they will likely impact future hiring decisions or the involvement of advisory boards for strategic planning by the disciplines.

## III. SEEBME Statistics

### Table 2. Faculty and Students in SEEBME Programs

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<th>Metric</th>
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<th>EME</th>
<th>SEEBME</th>
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<td>13</td>
<td>16</td>
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Footnotes:
[1] UG2010 is total number of undergraduates in program in June 2010, just prior to the official start of the new School. The ENVE value represents the UG enrollment when the ENVE faculty were part of the CEE department.
[2] UG2011 is total number of undergraduates in program in April 2011, nine months after the official start of the new School
[3] Secondary faculty are those with primary appointments in other programs, schools, or colleges who teach, advise and fund students in the primary program.
SEEBME student statistics (above) were also contrasted against student data from other schools in CEAS.

Table 3. Students in CEAS Programs

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<th>School/ Program</th>
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<td>Civil Engineering (including ACCEND)</td>
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<td>+ students to choose either CHE or MTEN</td>
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<td>Materials Engineering</td>
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<td><strong>School of Computing Sciences and Informatics</strong></td>
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<td>Mechanical Engineering (including ACCEND)</td>
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<td><strong>School of Engineering Education</strong></td>
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<td>Freshman Engineering Program</td>
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<td><strong>Total Engineering students</strong></td>
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Footnotes:
[1] 2010-11 numbers by program provided by Dean Mark Bowers and do not included CAS students.
[2] Numbers based on actual degree-granting programs and represent total enrollees for the five-year undergraduate programs reflective of the head count of November 15, 2010.
[3] Education is a school but it is not a degree program. This school oversees the Freshman Engineering program.
[4] Although the Environmental Engineering undergraduate degree has been approved there is not, as of yet, any undergraduate students in this major.
IV. Data collected for charge #1

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Figure 1.
Bubble Chart Calculation:

For each individual, the percentage of time spent working in each focus area was multiplied by all of the amounts of time they specified as working in each area and that value was then inserted in the corresponding cells in the heat map. As an example, if professor A spent 50% of his/her time working in field B and 50% in field C, the two cells that represent the intersection of those points, (B,C) and (C,B) would each receive values of 50 x 50, or 2500 for that professor. The values were then summed for all of the respondents. Since the values along the axis became very high, the square root of each cell was taken for the final matrix.

The colors were determined by showing cells with a 0 as white with a gradient of blue up to the maximum value in each matrix. The max values were determined as part of the matrix as a whole, not as a function of each row or column.
Observations

- Faculty in each SEEBME program collaborate most closely with the Faculty in their home (primary) program.

Beyond the primary within-program collaborations, the following interactions among SEEBME Faculty are evident:

- The CHE Faculty currently collaborates most closely with ENVE Faculty. This collaboration is expected to grow in the future.

- The BME Faculty currently collaborates closely with BME Faculty and with CHE Faculty in the advanced materials and bio and life sciences areas.

- EME Faculty tends to collaborate broadly across the school.

V. Data collected for charge #2

A. With whom do all SEEBME faculty currently collaborate in other schools in CEAS? How does the SEEBME faculty believe these CEAS collaborations will change in the next 3-5 years?

Figure 3.
Observation

- Faculty in the 4 programs of SEEBME currently collaborates most closely with other faculty within SEEBME (~75%). While SEEBME faculty may increase their level of collaboration outside the School and outside the college in the next 3-5 years, the primary interaction is expected to be with colleagues inside their home programs (~70%).

- SEEBME faculty also collaborates with faculty in other schools within CEAS. These collaborations represent 23% of their effort now and are expected to account for 29% of their collaborative effort in the next 3-5 years. This change is not significant, however.

**B. With whom do SEEBME faculty in the four programs currently collaborate in other schools in CEAS?**

---

**Figure 4.**
C. How does the SEEBME faculty in these four programs believe these collaborations will change in the next 3-5 years?

Observations

- Among the four programs, BME faculty collaborates most with other schools, both currently (33%) and in the future (43%). BME faculty collaborates most with faculty in Dynamic Systems, Aerospace, CSI and EECES. These collaborations will grow significantly in the next 3-5 years (p=.018) in all areas except the Aerospace area.

- CHE and EME faculty collaborate outside SEEBME less often than BME faculty. These current collaborations (22-27%) are not expected to change in the future (22-26%) (p>.05). CHE faculty collaborates most often with Dynamic Systems and EECES while EME faculty collaborates with numerous schools. CHE faculty will continue to collaborate with Dynamic Systems and EECES in the future but also with Aerospace Systems. EME faculty will collaborate most with EECES faculty in the next 3-5 years.

- ENVE faculty currently collaborate least outside SEEBME (16%) but these collaborations will grow significantly in the future (22%) (p=.032). These collaborations are with numerous other schools.

The projected trends for increased collaboration between SEEBME and other Schools across the College are evident in Table 3 which shows results of a paired t-test comparing current and future interactions at the program level and at the school level. In all cases, the average
degree of collaboration is expected to grow over the next 3 to 5 years, with statistically significant results for BME, ENVE and SEEBME as a whole.

Table 4. Comparison of Current versus Future SEEBME Collaboration with CEAS Schools.

<table>
<thead>
<tr>
<th>Program</th>
<th>N</th>
<th>“t”</th>
<th>1-sided p</th>
<th>Conclude</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] BME</td>
<td>9</td>
<td>2.94</td>
<td>0.009</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>[2] CHE</td>
<td>6</td>
<td>0.54</td>
<td>0.305</td>
<td>Accept H₀</td>
</tr>
<tr>
<td>[3] EME</td>
<td>6</td>
<td>1.00</td>
<td>0.181</td>
<td>Accept H₀</td>
</tr>
<tr>
<td>[4] ENVE</td>
<td>12</td>
<td>2.46</td>
<td>0.016</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>SEEBME</td>
<td>33</td>
<td>3.38</td>
<td>0.001</td>
<td>Reject H₀</td>
</tr>
</tbody>
</table>

H₀ : Collaboration with other CEAS Schools will **not** increase.

Hₐ : Collaboration with other CEAS Schools will increase.
VI. Data collected for charge #3

A. With whom do all SEEBME faculty currently collaborate in other colleges at UC? How does the SEEBME faculty believe these UC collaborations will change in the next 3-5 years?

**Observation**
- SEEBME faculty also currently collaborates with faculty in other colleges at UC (31%) and these collaborations will increase significantly in the future (42%) (p<.0001). In the remaining 20-25% of the time that they collaborate, they most often collaborate currently and in the future with faculty in Medicine (16-19%), Arts and Sciences (8-9%), DAAP (3-4%) and Business (1-2%).
B. With whom do SEEBME faculty in the four programs currently collaborate in other colleges at UC?

![Pie charts showing collaboration between SEEBME faculty and other colleges at UC.](image)

Figure 7.

C. How does the SEEBME faculty in these four programs believe these UC collaborations will change in the next 3-5 years?

![Pie charts showing projected changes in UC collaborations.](image)

Figure 8
Observations

- BME faculty currently collaborates outside CEAS more than other SEEBME program faculty (59%) and these collaborations will increase significantly in the future (66%) \((p<0.042)\). Almost half of their collaborations (45-46%) are with the College of Medicine with smaller percentage collaborations with DAAP (5-6%), Arts and Sciences (4%) and Business (3-7%).

- CHE faculty also collaborates outside CEAS, both currently (23%) and in the future (33%) \((p>.05)\). CHE faculty collaborates most with COM faculty, increasing from a current frequency of 18% to a future frequency of 23%. The smaller percentage contributions with Arts and Sciences and Pharmacy are expected to change only a small amount in the next five years.

- Energy and Materials faculty also currently collaborates outside CEAS (36%) and these collaborations will increase significantly in the future (48%) \((p<.045)\). EME faculty collaborates most with Arts and Sciences faculty (21%) and to a lesser extent with Pharmacy faculty (9% currently and 14% in the future).

- ENVE faculty currently collaborates to a smaller extent outside CEAS (13%), but these collaborations will grow significantly in the future (25%) \((p<.005)\). These collaborations will become more diverse in the future, including faculty in Arts and Sciences, Medicine, and DAAP.

The projected trends for increased collaboration between SEEBME and other Colleges across campus are evident in Table 4 which shows results of a paired \(t\)-test comparing current and future interactions at the program level and at the school level. In all cases, the average degree of collaboration is expected to grow over the next 3 to 5 years, with statistically significant results for BME, EME, ENVE and SEEBME as a whole.

Table 5. Comparison of Current versus Future SEEBME Collaboration with UC Colleges.

<table>
<thead>
<tr>
<th>Program</th>
<th>N</th>
<th>&quot;t&quot;</th>
<th>1-sided (p)</th>
<th>Conclude</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>9</td>
<td>2.41</td>
<td>0.021</td>
<td>Reject (H_0)</td>
</tr>
<tr>
<td>CHE</td>
<td>6</td>
<td>1.36</td>
<td>0.116</td>
<td>Accept (H_0)</td>
</tr>
<tr>
<td>EME</td>
<td>6</td>
<td>2.65</td>
<td>0.023</td>
<td>Reject (H_0)</td>
</tr>
<tr>
<td>ENVE</td>
<td>12</td>
<td>3.47</td>
<td>0.002</td>
<td>Reject (H_0)</td>
</tr>
<tr>
<td>SEEBME</td>
<td>33</td>
<td>5.01</td>
<td>0.000</td>
<td>Reject (H_0)</td>
</tr>
</tbody>
</table>

\(H_0\) : Collaboration with other UC Colleges will not increase.

\(H_a\) : Collaboration with other UC Colleges will increase.
VII. Data collected for charge #4 (Reduce undergraduate programs to a number consistent with the level of available resources, including faculty and high quality students).

**Figure 9.**

- **SEEBME**
  - School of Bioengineering
    - BS/MS/PhD in BME
    - *BS in BioE (joint w/ChE & ENVE)

- School of ChE & ENVE**
  - BS/MS/PhD in ChE
  - BS/MS/PhD in ENVE

- **UC Energy Institute**
  - MEng in Energy (TBD)
  - UG Energy Tracks
    - ChE, EME, ME, EE, ENVE, Aero, Civil, BME

- **UC Materials Institute***
  - MS/PhD in MSE
  - UG Minor in MSE
  - UG EME Track
Figure 9 shows our proposal overall SEEBME reorganization (i.e., SEEBME on top, new schools/institutes below). Figure 10 shows the details of interactions between schools and institutes in the new CEAS structure.

These charts show the creation of 2 new schools, Chemical & Environmental Engineering, and Bioengineering collectively offering 3 undergraduate degrees (BS in CHE, ENVE and BME); and two college-wide Energy and Materials Institutes that would grant graduate degrees only, MEng in Energy (proposed) and MS/PhD in Materials Science (current). This reorganization would address **Charge 4** by reducing the number of undergraduate programs currently in SEEBME from 4 to 3. Provided additional resources are allocated, undergraduate degrees in Biological Engineering (administered jointly by BME, CHE and ENVE) and Energy and Materials Engineering (by the Materials Institute jointly with all CEAS schools) may be also offered in the future.
Figure 11.
Shown are the current CEAS school structure (left; in linear form to save space) and the proposed CEAS structure, with eight schools communicating with the new Energy and Materials Institute.

This proposed CEAS structure (Figure 11) also addresses the remaining Charges 1-3 stated above. At the new school level, undergraduate programs in CHE and ENVE are anticipated to have at least 2 (and possibly 3) common years followed by the core curriculum in each discipline and jointly administered elective tracks (Figure 12). The same would apply to the proposed undergraduate program in Biological Engineering that would have 2 common years with CHE and ENVE followed by the core BioE curriculum taught jointly by these new schools (Figure 13).

The new institutes administered by the CEAS Graduate Office would house graduate degree programs only as stated above. In addition, the UC Energy Institute would coordinate undergraduate elective tracks in energy to be offered by each school in its respective focus areas. It is anticipated that undergraduate (and graduate) students from one program pursuing energy tracks would be able to take energy electives offered by other schools. This would significantly expand educational opportunities in energy for both undergraduate and graduate students, whereas the UC Materials Institute would continue to offer its Energy and Materials track to all college students as well as a Materials minor to undergraduate students UC-wide.
The proposed school of Chemical and Environmental Engineering (SCEE) will house two accredited degrees, one in Chemical Engineering and one in Environmental Engineering.
Figure 13.
The proposed school of Bio-Engineering (SBE) will house two accredited degrees, one in Biomedical Engineering and one in Biological Engineering.
VIII. Final Recommendations

**Observation** - Energy issues transcend SEEBME and encompass all engineering disciplines.

**Recommendation** - Form a new college-wide (virtual) **Energy Institute** to encourage and facilitate curriculum development, course offerings, graduate research and faculty collaborations across the full spectrum of energy-related problems.

**Notes**
- Undergraduate Level – define track options and a minor in Energy.
- Graduate Level – facilitate MEng degree, MS degree and PhD degree in Energy.
- **Energy Institute** is not an ABET accredited program; it is a CEAS focal point for Energy.
- Participating CEAS students retain primary affiliation with a home program and school with an optional Energy Track.
- Reduction in undergraduate course offerings is achieved.

**Observation** - Materials areas are vital graduate research fields that transcend SEEBME and encompass all engineering disciplines.

**Recommendation** - Form a new college-wide **Materials Institute**

**Notes**
- Undergraduate Level – define track options and a minor in Materials.
- Graduate Level – Facilitate MEng degree, MS degree and PhD degree in Materials.
- **Materials Institute** is not an ABET accredited program; it is a CEAS focal point for Materials.
- Participating CEAS students retain primary affiliation with a home program and school with an optional Materials Track.
- Reduction in undergraduate course offerings is achieved.

**Observation** - Existing synergy between Chemical Engineering and Environmental Engineering in instruction and in research is expected to grow.

**Recommendation** - Form a new **School of Chemical & Environmental Engineering**

**Notes**
- There is national precedent for a combined Chemical/Environmental program.
- IEP (common first 2 years)...richness of experience is achieved.
- ABET accredited BS degree in Chemical Engineering with various track options.
- ABET accredited BS degree in Environmental Engineering with various track options.
- Admit first students to ENVE in Autumn 2012.
- OSU growth: BSEE in 2007...from 3 to 74 students; 40% women. (C. Merry, 11 April 2011).
- Substantial increase in undergraduate enrollment is achieved with a minimum number of additional new courses.
**Observation** - Biological issues transcend the existing biomedical program and encompass disciplines within and outside of CEAS.

**Recommendation** - Form a new **School of Bio-Engineering**

**Notes**
- ABET-accredited BS degree in Bio-Medical Engineering with various track options.
- Undergraduate Level- Biomedical is strong and growing in the medical device, pre-med and research options. The addition of a Biological Engineering degree both strengthens and broadens the new school.
- Graduate Level- Focus areas in tissue engineering and biomechanics and medical imaging are strong and should be complemented with focus areas in medical devices and nanotechnology.
- BME is competitive, at both the undergraduate and graduate levels, with other similar programs at other universities.
- The US Bureau of Labor Statistics finds that among all professions, biomedical engineering is expected to grow the most between 2008 and 2018 (72% nationally and 61% in Ohio).
- The National Academy of Engineering lists among its Grand Challenges three bioengineering entries: Advance Human Informatics, Engineer Better Medicines, and Reverse-engineer the Brain.
- BME is the most broadly collaborative of the four programs in SEEBME; BME collaborates extensively with other CEAS schools and with other UC colleges and can be a model for breaking down silos and forging inter-college collaborations and teams.
IX. Additional General Recommendations

- This report, with its proposed new programs and schools, needs to be shared with the entire SEEBME faculty for their input and critique.
- The next step in data gathering should entail the determination of collaborations outside of UC. This data will be an important percentage to determine and will ultimately add more value to the data collected to date.
- We recommend that the remaining schools in SEEBME perform a similar analysis to determine how much they interact with other SEEBME faculty, with other schools in the college, and with other colleges at UC.
- We also recommend that CEAS take the lead across UC in performing similar analyses in other colleges. Coordinating these efforts between colleges will increase the likelihood of minimizing duplication across campus and identifying multidisciplinary teams who can respond rapidly to regional and national research and educational opportunities.
- We also recommend that the Center for Economic Education in UC’s College of Business be commissioned to help determine the “demand” for our BS, MS, MEng, and PhD graduates. This additional data is critical and complements the work of this committee whose members have has focused more on the “supply” side of the problem.
- We believe the proposed structure eliminates the disadvantages of the present SEEBME structure because currently, it does not leverage existing and future synergies between programs currently in SEEBME.
- No additional support staff is anticipated for the proposed structure.

X. Appendix

Online surveys
A1. Online survey 1

SEEBME Implementation Committee

1. Name

2. What is your classification?
   - Tenured Faculty
   - Tenure Track Faculty
   - Field Service/Educator Track
   - Adjunct Professor
   - Research Track
   - Other (please specify)

3. Which SEEBME Program are you primarily associated with?
   - Biomedical Engineering
   - Chemical Engineering
   - Energy and Materials Engineering
   - Environmental Engineering

4. What percentage of your time do you currently spend working in each of the following research areas? (No response means 0%, only enter numbers adding up to 100 and do not include a % sign)
   - Advanced Materials
   - Air Resources
   - Bio and Life Sciences
   - Bioinformatics
   - Energy & the Environment
   - Energy from Biomass
   - Energy Storage
<table>
<thead>
<tr>
<th>Research Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fossil &amp; Nuclear</td>
<td></td>
</tr>
<tr>
<td>Fuel Cells</td>
<td></td>
</tr>
<tr>
<td>Medical Devices</td>
<td></td>
</tr>
<tr>
<td>Medical Imaging</td>
<td></td>
</tr>
<tr>
<td>Tissue Engineering &amp; Biomechanics</td>
<td></td>
</tr>
<tr>
<td>Nanotechnology</td>
<td></td>
</tr>
<tr>
<td>Polymers for Energy Systems</td>
<td></td>
</tr>
<tr>
<td>Separations</td>
<td></td>
</tr>
<tr>
<td>Solar Energy</td>
<td></td>
</tr>
<tr>
<td>Sustainable Urban Environments</td>
<td></td>
</tr>
<tr>
<td>Water Quality</td>
<td></td>
</tr>
<tr>
<td>Water Resources</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

5. What percentage of your time do you plan on working in each of the following research areas in the next 3-5 years? (No response means 0%, only enter number adding up to 100 and do not include a % sign)

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Materials</td>
<td></td>
</tr>
<tr>
<td>Air Resources</td>
<td></td>
</tr>
<tr>
<td>Bio and Life Sciences</td>
<td></td>
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<tr>
<td>Bioinformatics</td>
<td></td>
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<tr>
<td>Energy &amp; the Environment</td>
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<tr>
<td>Energy from Biomass</td>
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<tr>
<td>Energy Storage</td>
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<tr>
<td>Fossil &amp; Nuclear Research</td>
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<tr>
<td>Fuel Cells</td>
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<tr>
<td>Medical Devices</td>
<td></td>
</tr>
<tr>
<td>Medical Imaging</td>
<td></td>
</tr>
</tbody>
</table>
Tissue Engineering & Biomechanics
Nanotechnology
Polymers for Energy Systems
Separations
Solar Energy
Sustainable Urban Environments
Water Quality
Water Resources
Other

6. If you answered other to any of the above questions please elaborate

[Text box for elaboration]

Done

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Create your own free online survey now!
A2. Online survey 2

SEEBME Implementation Committee

1.

*1. Name

2. What percentage of your time do you currently spend collaborating with individuals in the following CEAS Schools (do not limit yourself to funded research)? (No response means 0%, only enter numbers adding up to 100 and do not include a % sign)
   - School of Advanced Structures
   - School of Aerospace Systems
   - School of Computing Sciences and Informatics
   - School of Dynamic Systems
   - School of Electronics and Computing Systems
   - School of Energy, Environmental, Biological and Medical Engineering
   - School of Engineering Education

3. What percentage of your time do you currently spend collaborating with individuals in the following CEAS Schools in the next 3-5 years (do not limit yourself to funded research)? (No response means 0%, only enter numbers adding up to 100 and do not include a % sign)
   - School of Advanced Structures
   - School of Aerospace Systems
   - School of Computing Sciences and Informatics
   - School of Dynamic Systems
   - School of Electronics and Computing Systems
   - School of Energy, Environmental, Biological and Medical Engineering
   - School of Engineering Education

4. What percentage of your time do you currently spend collaborating with individuals in the following colleges within the University (do not limit yourself to funded research)? (No response means 0%, only enter numbers adding up to 100 and do not include a % sign)
   - College of Allied Health Sciences
   - College of Arts and Sciences
   - College of Business
   - College of Design, Architecture, Art, and Planning

1 of 3

05/02/2011 09:48 AM
5. What percentage of your time do you currently spend collaborating with individuals in the following colleges within the University in the next 3-5 years (do not limit yourself to funded research)? (No response means 0%, only enter numbers adding up to 100 and do not include a % sign)

College of Allied Health Sciences
College of Arts and Sciences
College of Business
College of Design, Architecture, Art, and Planning
College of Education, Criminal Justice, and Human Services
College of Engineering & Applied Science
College of Law
College of Medicine
College of Nursing
College of Pharmacy
College-Conservatory of Music

Done

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