

**Final Agenda**  
**Workshops 1 and 2 of the Center for Sustainable Engineering (CSE)**  
**Carnegie Mellon University, Arizona State University, University of Texas at Austin**  
**July 17-21, 2006**  
**University Center, Carnegie Mellon University, Pittsburgh, Pennsylvania**

**CSE Executive Committee**

**CMU: Michael Bridges, Cliff Davidson, Chris Hendrickson, Scott Matthews**  
**ASU: Braden Allenby, Yongsheng Chen, John Crittenden, Eric Williams**  
**UT: David Allen, Cynthia Murphy**  
**US EPA: Sharon Austin**

Sunday July 16, 2006

5:30-6:30 Reception, *Schatz Dining Room*  
6:30-8:00 Dinner

Monday July 17

**Workshop 1**

**Sessions will be in the McKenna-Peter-Wright Room, except breakout group sessions which have rooms indicated below.**

- 9:00-9:30 1 Introduction and Goals: A Transition in Engineering Education. **Cliff Davidson**
- 9:30-10:00 2 Sustainable Engineering (SE): What is it? **Brad Allenby**
- 10:00-10:45 3 Panel discussion on SE: What can we do with it? **Moderator: Indira Nair, Vice Provost for Education, CMU; Panel members: Chris Hendrickson, John Crittenden, and Cindy Murphy.**
- 10:45-11:00 Break
- 11:00-12:00 4 Participants meet in breakout groups for four simultaneous interactive sessions. Each participant makes a 3-minute presentation on his or her module to the breakout group, followed by brief discussion. Breakout Rooms and Leaders:  
Energy: *McKenna front.* **Cindy Murphy & Deanna Matthews**  
Industrial Ecology: *McKenna rear.* **Yongsheng Chen & John Crittenden**  
Materials & Manuf.: *Dowd Room.* **Chris Hendrickson & Scott Matthews**  
Water Resources: *Carnegie East Room.* **Cliff Davidson & Dave Dzombak**
- 12:00-1:00 Lunch, *General Motors Dining Room*
- 1:00-2:00 5 Meet in breakout groups to develop a list of possible topics in SE in the subject area of the breakout group that would be included in a freshman introductory engineering course. Breakout Rooms:  
Energy: *McKenna front.*  
Industrial Ecology: *McKenna rear.*  
Materials & Manuf.: *Dowd Room.*  
Water Resources: *Class of 87 Room.*

- 2:00-2:30 6 Entire workshop re-convenes: One person from each breakout group presents their list of topics.
- 2:30-3:00 Break
- 3:00-4:45 7 Interactive session: Learning objectives for SE modules. **Marsha Lovett, CMU Eberly Center**
- 4:45-5:00 8 Assign work due Tuesday morning: write the learning objectives for your chosen module. Work individually or in groups of 2-3 (during free time or after dinner).
- 5:00-5:30 Group Photograph (rain date: Tuesday)
- 5:30-6:30 Free time
- 6:30-8:00 Dinner and speaker, *Schatz Dining Room*: **Brad Allenby**

Tuesday July 18

- 9:00-9:45 9 Meet in breakout groups to discuss written assignment on learning objectives for your chosen module. Each breakout group selects two modules as examples for a list to be given to the entire workshop. Breakout Rooms:  
 Energy: *McKenna front.*  
 Industrial Ecology: *McKenna rear.*  
 Materials & Manuf.: *Dowd Room.*  
 Water Resources: *Class of 87 Room.*
- 9:45-10:00 Break
- 10:00-11:45 10 Entire workshop re-convenes. Interactive session: (a) Feedback on learning objectives of the two selected modules from each breakout group, and (b) Assessment of student learning of SE modules. **Anne Fay, CMU Eberly Center**
- 11:45-12:45 Lunch, *General Motors Dining Room*
- 12:45-2:15 11 Meet in breakout groups to discuss (a) SE challenges and opportunities in the breakout group topic: material such as LCA, ecological footprint, CO2 calculators, and mass/energy balances, and (b) methods of assessing student learning of this material, such as use of rubrics. Each breakout group selects one participant to report back to the main group.  
 Breakout Rooms:  
 Energy: *McKenna front.*  
 Industrial Ecology: *McKenna rear.*  
 Materials & Manuf.: *Caffee Room.*  
 Water Resources: *Class of 87 Room.*
- 2:15-3:15 12 Entire workshop re-convenes. Interactive session: Report on SE challenges/ opportunities and assessment of student learning from each breakout group. **Anne Fay and Mike Bridges, CMU Eberly Center**
- 3:15-3:45 Break
- 3:45-4:15 13 Sustainable Engineering and the ABET Process. **Jim Garrett**
- 4:15-4:45 14 Educational materials website: using the site and contributing modules. **Scott Matthews and Sharon Austin**
- 4:45-5:00 15 Assign work due Wednesday morning: Participants with less experience in SE should summarize the types of content they wish to include in their module or course, along with specific learning objectives. Participants with more experience

- in SE should describe what has worked for them in successful classes, such as the content and reference materials, as well as obstacles that had to be overcome.
- 5:00-6:00 Overview of life cycle teaching resources. **Scott Matthews**
- 6:30-8:00 Dinner and speaker, *Schatz Dining Room*: **Granger Morgan, Head, Department of Engineering & Public Policy, CMU**

Wednesday July 19

- 9:00-10:00 **16** Entire workshop convenes to discuss (a) content and objectives for less experienced participants, and what has worked well for more experienced participants, and (b) the role of SE in the engineering curriculum.
- 10:00-10:45 **17** Wrap-up Session. **Cliff Davidson**
- 10:45-11:30 Coffee Break with Workshop 1 and Workshop 2 attendees.  
Workshop 1 participants can stay for lunch with prior RSVP.

### **Workshop 2**

**Sessions on Wednesday and Thursday will be in the McKenna-Peter-Wright Room, except breakout group sessions which have rooms indicated below. Sessions on Friday will be the rooms indicated below.**

- 11:30-12:00 **1** Introduction and Goals: A Transition in Engineering Education. **Cliff Davidson**
- 12:00-12:30 **2** Sustainable Engineering (SE): What is it? **Brad Allenby**
- 12:30-1:30 Lunch, *General Motors Dining Room*
- 1:30-2:15 **3** Panel discussion on SE: What can we do with it? **Moderator: Indira Nair, Vice Provost for Education, CMU; Panel members: Chris Hendrickson, John Crittenden, and Cindy Murphy.**
- 2:15-3:15 **4** Participants meet in breakout groups for four simultaneous interactive sessions. Each participant makes a 3-minute presentation on his or her module to the breakout group, followed by brief discussion. Breakout Rooms and Leaders:  
Energy: *McKenna, front.* **Cindy Murphy & Deanna Matthews**  
Green Buildings: *Dowd Room.* **Robert Ries & Steve Lee**  
Industrial Ecology: *McKenna, rear.* **Yongsheng Chen & John Crittenden**  
Water Res.: *Danforth Lounge.* **Cliff Davidson & Jeanne VanBriesen**
- 3:15-3:45 Break
- 3:45-5:30 **5** Entire workshop re-convenes. Interactive session: Learning objectives for SE modules. **Marsha Lovett, CMU Eberly Center**
- 5:30-5:45 **6** Assign work due Thursday morning: write the learning objectives for your chosen module. Work individually or in groups of 2-3 (free time or after dinner).
- 5:45-6:15 Group Photograph (rain date: Thursday)
- 6:30-8:00 Dinner and speaker, *Schatz Dining Room*: **Brad Allenby**

Thursday July 20

- 9:00-9:45 **7** Meet in breakout groups to discuss written assignment on learning objectives for your chosen module.

Breakout Rooms:

Energy: *McKenna front.*

Green Buildings: *Class of 87 Room.*

Industrial Ecology: *McKenna rear.*

Water Resources: *Carnegie West Room.*

9:45-10:00 Break

10:00-11:45 **8** Entire workshop re-convenes. Interactive session: (a) Report from the field by experienced participants, and (b) Assessment of student learning of SE modules: use of rubrics when there are no right or wrong answers. **Anne Fay, CMU Eberly Center**

11:45-12:45 **9** Meet in breakout groups to develop a list of possible topics in SE in the subject area of the breakout group that would be included in a freshman introductory engineering course. Breakout Rooms:

Energy: *McKenna front.*

Green Buildings: *Coffee Room.*

Industrial Ecology: *McKenna rear.*

Water Resources: *Class of 87 Room.*

12:45-1:45 Lunch, *General Motors Dining Room.*

1:45-3:15 **10** Meet in breakout groups to discuss (a) SE challenges and opportunities in the breakout group topic: material such as LCA, ecological footprint, CO2 calculators, and mass/energy balances, and (b) methods of assessing student learning of this material, such as use of rubrics. Each breakout group selects one participant to report back to the main group.

Breakout Rooms:

Energy: *McKenna front.*

Green Buildings: *Coffee Room.*

Industrial Ecology: *McKenna rear.*

Water Resources: *Class of 87 Room.*

3:15-3:45 Break

3:45-4:45 **11** Entire workshop re-convenes. Interactive session: Report on SE challenges/opportunities and assessment of student learning from each breakout group. **Anne Fay and Mike Bridges, CMU Eberly Center**

4:45-5:00 **12** Assign work due Friday morning: Participants with less experience in SE should summarize the types of content they wish to include in their module or course, along with specific learning objectives. Participants with more experience in SE should describe what has worked for them in successful classes, such as the content and reference materials, as well as obstacles that had to be overcome.

5:00-5:30 **13** Sustainable Engineering and the ABET Process. **Larry Cartwright**

5:30-6:30 Overview of life cycle teaching resources. **Scott Matthews**

6:30-8:00 Dinner and speaker, *Schatz Dining Room*: **Angela Lindner**

Friday July 21

9:00-10:00 **14** Entire workshop convenes to discuss (a) content and objectives for less experienced participants, and what has worked well for more experienced participants, and (b) the role of SE in the engineering curriculum.

- 10:00-10:15 Break
- 10:15-10:45 **15** Educational materials website: using the site and contributing modules. *H&SS Auditorium. **Scott Matthews and Sharon Austin***
- 10:45-11:30 **16** Wrap-up Session. *H&SS Auditorium. **Cliff Davidson***
- 11:45-12:45 Lunch for those Workshop 2 participants with prior RSVP. *General Motors Dining Room.*
- 11:45-12:45 Lunch for Workshop Faculty, Advisory Board Members, and Media. *Dilkes Library, Roberts Hall.*
- 1:00-3:00 Advisory Board members meet with CSE Executive Committee. *Dilkes Library, Roberts Hall.*