

## Agenda

### *Engineering in Transition*

Workshops 1 and 2 of the Center for Sustainable Engineering (CSE)  
Carnegie Mellon University, University of Texas at Austin, Arizona State University  
July 13-17, 2009  
at Carnegie Mellon University

### CSE Executive Committee

CMU: Michael Bridges, Cliff Davidson, Chris Hendrickson, Scott Matthews  
ASU: Braden Allenby, Y. Chen, John Crittenden (now at Georgia Tech), Eric Williams  
UT: David Allen, Cynthia Murphy  
US EPA: Sharon Austin

### SUNDAY JULY 12

6:30-8:00 Dinner at the Schatz Dining Rm, University Center. Speaker: **John Crittenden**

### MONDAY JULY 13

#### Workshop 1

**Sessions will be in Singleton Room on the Carnegie Mellon University campus**

- 9:00-9:05 Welcome by Carnegie Mellon President Jared Cohon
- 9:05-9:20 **1** Introduction and Goals: A Transition in Engineering Education. **Cliff Davidson**
- 9:20-9:45 **2** Sustainable Engineering (SE): What is it? **Brad Allenby**
- 9:45-10:45 **3** Panel Discussion: How are engineering programs around the U.S. implementing SE? **Intro by Cindy Murphy (~10 slides on Benchmark Project). Cindy will then moderate a panel of three workshop participants chosen in advance who will each describe (without slides) what SE courses or programs exist at their institutions.**
- 10:45-11:15 Break
- 11:15-11:45 **4** Teaching SE to younger students. **Intro by Chris Hendrickson. Chris will then moderate a panel of three workshop participants chosen in advance who will describe (without slides) their experiences in teaching at the college freshman level.**
- 11:45-12:45 Lunch
- 12:45-1:45 **5** Participants meet in breakout groups by topic area for four simultaneous interactive sessions. Each group will discuss elements of SE programs they are familiar with, and will identify the best practices among those discussed.  
Breakout rooms and leaders:  
Energy: *Porter Hall A18C* **Cindy Murphy and Scott Matthews**  
Manufacturing, Materials, & Design: *Singleton Room* **Robert Heard**  
Structures, Construction, & Infrastructure: *CEE Conference Room* **Chris Hendrickson and Brad Allenby**  
Air & Water Resources: *CEE Classroom* **John Crittenden and Cliff Davidson**

- 1:45-2:30 **6** Entire workshop re-convenes: One participant from each breakout group presents their list of best practices.
- 2:30-3:00 Break
- 3:00-4:00 **7** Learning Objectives with examples from SE. **Deanna Matthews**
- 4:00-5:00 **8** 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: *Porter Hall A18C* **Cindy Murphy and Scott Matthews**  
 Manufacturing, Materials, & Design: *Singleton Room* **Robert Heard**  
 Structures, Construction, & Infrastructure: *CEE Conference Room* **Chris Hendrickson and Brad Allenby**  
 Air & Water Resources: *CEE Classroom* **John Crittenden and Cliff Davidson**
- 5:00-5:15 **9** Assign work due Tuesday morning: work is done individually or in groups of 2-3. Each individual prepares a powerpoint slide about their module, including the following: (1) name, university, department, and course title, (2) intended audience, e.g., freshmen in chemical engineering, (3) major topic(s) covered in module, (4) learning objectives.
- 5:15-5:30 Workshop evaluations distributed and completed by all participants
- 5:30-5:45 Group Photograph (rain date: Tuesday morning 8:45)
- 5:45-6:30 Free time
- 6:30-8:00 Dinner at the Engineer's Society of Western Pennsylvania. Speaker: **Lester Lave**

## **TUESDAY JULY 14**

- 9:00-10:00 **10** Entire workshop convenes. Two powerpoint slides from each breakout group, 8 slides total, will be chosen for presentation and discussion. (Participants will bring their laptops and copy their slides onto a memory stick during breakfast. Group leaders will choose the slides to be presented from each breakout group.)
- 10:00-10:30 **11** Life Cycle Assessment as a Tool for SE. **Scott Matthews**
- 10:30-11:00 Break
- 11:00-12:00 **12** Meet in breakout groups to discuss SE tools and metrics in the breakout group topic. Tools such as LCA, CO2 calculators, and mass/energy balances will be discussed, as well as metrics such as ecological footprints, total rates of consumption, and total rates of waste generation. Each breakout group selects one participant to report back to the main group:  
 Energy: *Porter Hall A18C* **Cindy Murphy and Scott Matthews**  
 Manufacturing, Materials, & Design: *Singleton Room* **Robert Heard**  
 Structures, Construction, & Infrastructure: *CEE Conference Room* **Chris Hendrickson and Brad Allenby**  
 Air & Water Resources: *CEE Classroom* **John Crittenden and Cliff Davidson**
- 12:00-12:30 **13** Entire workshop re-convenes. Speaker from each breakout group makes a brief presentation on SE tools and metrics from the group.
- 12:30-1:30 Lunch

- 1:30-2:15 **14** NSF funding opportunities in Sustainable Engineering. **Chris Hendrickson and John Crittenden**
- 2:15-3:00 **15** The CSE Electronic Library **Cliff Davidson**
- 3:00-3:30 **16** Wrap-up Session. **Cliff Davidson**
- 3:30-3:45 Workshop evaluations distributed and completed by all participants
- 3:45 Adjourn

## WEDNESDAY JULY 15

- 2:00-4:00 Advisory Board meeting, Civil and Environmental Engineering Conference Room
- 4:00-5:00 CSE Executive Committee, meet following Advisory Board
- 6:30-8:00 Dinner at the Schatz Dining Rm, University Center. Speaker: **John Crittenden**

## THURSDAY JULY 16

### Workshop 2

#### Sessions will be in the Singleton Room on the Carnegie Mellon University campus

- 9:00-9:20 **1** Introduction and Goals: A Transition in Engineering Education. **Cliff Davidson**
- 9:20-9:45 **2** Sustainable Engineering (SE): What is it? **Brad Allenby**
- 9:45-10:45 **3** Panel Discussion: How are engineering programs around the U.S. implementing SE? **Intro by Cindy Murphy (~10 slides on Benchmark Project). Cindy will then moderate a panel of three workshop participants chosen in advance who will each describe (without slides) what SE courses or programs exist at their institutions.**
- 10:45-11:15 Break
- 11:15-11:45 **4** Teaching SE to younger students. **Intro by Chris Hendrickson. Chris will then moderate a panel of three workshop participants chosen in advance who will describe (without slides) their experiences in teaching at the college freshman level.**
- 11:45-12:45 Lunch
- 12:45-1:45 **5** Participants meet in breakout groups by topic area for four simultaneous interactive sessions. Each group will discuss elements of SE programs they are familiar with, and will identify the best practices among those discussed.  
Breakout rooms and leaders:  
Energy: *Porter Hall A18C* **Cindy Murphy and Scott Matthews**  
Manufacturing, Materials, & Design: *Singleton Room* **Robert Heard**  
Structures, Construction, & Infrastructure: *CEE Conference Room* **Chris Hendrickson and Brad Allenby**  
Air & Water Resources: *CEE Classroom* **John Crittenden and Cliff Davidson**
- 1:45-2:30 **6** Entire workshop re-convenes: One participant from each breakout group presents their list of best practices.

- 2:30-3:00 Break
- 3:00-4:00 **7** Learning Objectives with examples from SE. **Deanna Matthews**
- 4:00-5:00 **8** 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: *Porter Hall A18C* **Cindy Murphy and Scott Matthews**  
 Manufacturing, Materials, & Design: *Singleton Room* **Robert Heard**  
 Structures, Construction, & Infrastructure: *CEE Conference Room* **Chris Hendrickson and Brad Allenby**  
 Air & Water Resources: *CEE Classroom* **John Crittenden and Cliff Davidson**
- 5:00-5:15 **9** Assign work due Thursday morning: work is done individually or in groups of 2-3. Each individual prepares a powerpoint slide about their module, including the following: (1) name, university, department, and course title, (2) intended audience, e.g., freshmen in engineering, (3) major topic(s) covered in module, (4) learning objectives.
- 5:15-5:30 Workshop evaluations distributed and completed by all participants
- 5:30-5:45 Group Photograph (rain date: Friday morning 8:45)
- 5:45-6:30 Free time
- 6:30-8:00 Dinner at Monterey Bay. Speaker: **Jay Apt**

## FRIDAY JULY 17

- 9:00-10:00 **10** Entire workshop convenes. Two powerpoint slides from each breakout group, 8 slides total, will be chosen for presentation and discussion. (Participants will bring their laptops and copy their slides onto a memory stick during breakfast. Group leaders will choose the slides to be presented from each breakout group.)
- 10:00-10:30 **11** Life Cycle Assessment as a Tool for SE. **Scott Matthews**
- 10:30-11:00 Break
- 11:00-12:00 **12** Meet in breakout groups to discuss SE tools and metrics in the breakout group topic. Tools such as LCA, CO2 calculators, and mass/energy balances will be discussed, as well as metrics such as ecological footprints, total rates of consumption, and total rates of waste generation. Each breakout group selects one participant to report back to the main group:  
 Energy: *Porter Hall A18C* **Cindy Murphy and Scott Matthews**  
 Manufacturing, Materials, & Design: *Singleton Room* **Robert Heard**  
 Structures, Construction, & Infrastructure: *CEE Conference Room* **Chris Hendrickson and Brad Allenby**  
 Air & Water Resources: *CEE Classroom* **John Crittenden and Cliff Davidson**
- 12:00-12:30 **13** Entire workshop re-convenes. Speaker from each breakout group makes a brief presentation on SE tools and metrics from the group.
- 12:30-1:30 Lunch
- 1:30-2:15 **14** NSF funding opportunities in Sustainable Engineering. **Chris Hendrickson and John Crittenden**

2:15-3:00 **15** The CSE Electronic Library **Cliff Davidson**  
3:00-3:30 **16** Wrap-up Session. **Cliff Davidson**  
3:30-3:45 Workshop evaluations distributed and completed by all participants  
3:45 Adjourn