

**Final Agenda**  
*Adding Sustainability to Engineering Education*  
**Workshops 1 and 2 of the Center for Sustainable Engineering (CSE)**  
**Syracuse University, Carnegie Mellon University,**  
**Arizona State University, Georgia Institute of Technology**  
**May 23-27, 2011**  
**Syracuse University**

**CSE Executive Committee Instructors for 2011 Workshops**  
**Syracuse University: Cliff Davidson**  
**Carnegie Mellon: Chris Hendrickson, Deanna Matthews**  
**Arizona State: Braden Allenby**  
**Georgia Tech: John Crittenden**

**SUNDAY MAY 22**

afternoon      Registration, Ernie Davis Hall, Syracuse University, 619 Comstock Avenue  
6:00-6:30      Reception at Goldstein Faculty Center, 401 University Place  
6:30 – 8:00    Dinner at Goldstein Faculty Center; welcome by **Cliff Davidson**

**MONDAY MAY 23**

**Workshop 1**

**Sessions will be at the Syracuse Center of Excellence in Environmental and Energy Systems (SyracuseCoE), 727 East Washington Street, Rm 203**

9:00-9:10      Welcome by Syracuse University Chancellor **Nancy Cantor**  
9:10-9:30    **1** Introduction and Goals: A Transition in Engineering Education **Cliff Davidson**  
9:30-10:00   **2** Sustainable Engineering (SE): What is it? **Brad Allenby**  
10:00-10:30   Break  
10:30-11:00   **3** The Gigaton Problem **John Crittenden**  
11:00-12:00   **4** Teaching SE to Freshmen and Sophomores **Group discussion led by Cliff Davidson and Brad Allenby**  
12:00-1:00    Lunch  
1:00-2:00    **5** Participants meet in breakout groups for four simultaneous interactive sessions. Each group discusses elements of SE programs they are familiar with (individual courses, certificates, minors, majors, curricula), and identifies best practices in SE education among those discussed. Group chooses one participant to report back to the entire workshop. Breakout rooms and leaders:  
                  Energy: Room 203, *Cliff Davidson*  
                  Manufacturing, Materials, & Design: 3<sup>rd</sup> Floor Lounge, *Brad Allenby*  
                  Structures, Construction, & Infrastructure: 3<sup>rd</sup> Floor Patio, *Chris Hendrickson*  
                  Water & Air Resources: Room 507, *John Crittenden*  
2:00-2:30    **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 **Sharon Dotger, SU School of Education**
- 4:00-4:15 Group Photograph (outdoors weather permitting, otherwise indoors)
- 4:15-5:15 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: Room 203, *Cliff Davidson*  
 Manufacturing, Materials, & Design: 3<sup>rd</sup> Floor Lounge, *Brad Allenby*  
 Structures, Construction, & Infrastructure: 3<sup>rd</sup> Floor Patio, *Chris Hendrickson*  
 Water & Air Resources: Room 507, *John Crittenden*
- 5:15-5:20 Assign work due Tuesday morning: work is done individually or in groups of 2-3. Each participant 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.
- 5:20-5:45 9 Tour of the SyracuseCoE headquarters building, **Ed Bogucz, Executive Director, SyracuseCoE**
- 5:45-6:00 Workshop evaluations distributed and completed by all participants
- 6:00-6:30 Walk (weather permitting) or take bus to Erie Canal Museum for reception and dinner (.49 miles)
- 6:30-8:00 Reception and dinner, Erie Canal Museum, 318 Erie Boulevard East  
 Speaker: **Ed Bogucz**
- 8:00 SUNY ESF bio-bus back to Ernie Davis Hall

## TUESDAY MAY 24

- 9:00-9:30 10 Breakout groups meet (same locations) and participants show their powerpoint slides. Each group selects one participant to present his or her slide to the entire workshop.
- 9:30-10:00 11 Entire workshop convenes. The four slides are presented.
- 10:00-10:30 Break
- 10:30-11:00 12 The Energy-Water Nexus **John Crittenden**
- 11:00-11:30 13 Life Cycle Assessment as a Tool for SE **Chris Hendrickson**
- 11:30-12:30 Lunch
- 12:30-1:30 14 Participants meet in breakout groups to discuss SE tools and metrics pertaining to the topic of the breakout group. Tools such as LCA, CO2 calculators, and mass/energy balances are 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 entire workshop:  
 Energy: Room 203, *Cliff Davidson and Richard Smardon, SUNY-ESF*  
 Manufacturing, Materials, & Design: 3<sup>rd</sup> Floor Lounge, *Brad Allenby*  
 Structures, Construction, & Infrastructure: 3<sup>rd</sup> Floor Patio, *Chris Hendrickson*  
 Water & Air Resources: Room 507, *John Crittenden*
- 1:30-2:00 15 Entire workshop re-convenes. One participant from each breakout group makes a brief presentation on SE tools and metrics from the group.
- 2:00-2:30 16 NSF funding opportunities in Sustainable Engineering **Chris Hendrickson**
- 2:30-3:00 17 The CSE Electronic Library **Cliff Davidson**

- 3:00-3:30 **18** Wrap-up Session. Workshop evaluations distributed and completed by all participants **Cliff Davidson**  
 3:30 Adjourn; SUNY ESF bio-bus available for airport transport

### WEDNESDAY MAY 25

- afternoon Registration, Ernie Davis Hall, Syracuse University, 619 Comstock Avenue  
 6:00-6:30 Reception at Goldstein Faculty Center, 401 University Place  
 6:30 – 8:00 Dinner at Goldstein Faculty Center; welcome by **Cliff Davidson**

### THURSDAY MAY 26

#### Workshop 2

**Sessions will be at the Syracuse Center of Excellence in Environmental and Energy Systems (SyracuseCoE), 727 East Washington Street, Rm 203**

- 9:00-9:10 Welcome by Syracuse University Chancellor **Nancy Cantor**  
 9:10-9:30 **1** Introduction and Goals: A Transition in Engineering Education **Cliff Davidson**  
 9:30-10:00 **2** Sustainable Engineering (SE): What is it? **Brad Allenby**  
 10:00-10:30 Break  
 10:30-11:00 **3** The Gigaton Problem **John Crittenden**  
 11:00-12:00 **4** Teaching SE to Freshmen and Sophomores **Group discussion led by Cliff Davidson and Brad Allenby**  
 12:00-1:00 Lunch  
 1:00-2:00 **5** Participants meet in breakout groups for four simultaneous interactive sessions. Each group discusses elements of SE programs they are familiar with (individual courses, certificates, minors, majors, curricula), and identifies best practices in SE education among those discussed. Group chooses one participant to report back to the entire workshop. Breakout rooms and leaders:  
     Energy: Room 203, *Cliff Davidson*  
     Manufacturing, Materials, & Design: 3<sup>rd</sup> Floor Lounge, *Brad Allenby*  
     Structures, Construction, & Infrastructure: 3<sup>rd</sup> Floor Patio, *Deanna Matthews*  
     Water & Air Resources: Room 507, *John Crittenden*  
 2:00-2:30 **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**  
 4:00-4:15 Group Photograph (outdoors weather permitting, otherwise indoors)  
 4:15-5:15 **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: Room 203, *Cliff Davidson*  
     Manufacturing, Materials, & Design: 3<sup>rd</sup> Floor Lounge, *Brad Allenby*  
     Structures, Construction, & Infrastructure: 3<sup>rd</sup> Floor Patio, *Deanna Matthews*  
     Water & Air Resources: Room 507, *John Crittenden*

- 5:15-5:20 Assign work due Friday morning: work is done individually or in groups of 2-3. Each participant 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.
- 5:20-5:45 **9** Tour of the SyracuseCoE headquarters building, **Ed Bogucz, Executive Director, SyracuseCoE**
- 5:45-6:00 Workshop evaluations distributed and completed by all participants
- 6:00-6:30 Walk (weather permitting) or take bus to Erie Canal Museum for reception and dinner (.49 miles)
- 6:30-8:00 Reception and dinner, Erie Canal Museum, 318 Erie Boulevard East  
Speaker: **Ed Bogucz, Introduced by Matthew Millea, Deputy County Executive, Onondaga County**
- 8:00 SUNY ESF bio-bus back to Ernie Davis Hall

## **FRIDAY MAY 27**

- 9:00-9:30 **10** Breakout groups meet (same locations) and participants show their powerpoint slides. Each group selects one participant to present his or her slide to the entire workshop.
- 9:30-10:00 **11** Entire workshop convenes. The four slides are presented.
- 10:00-10:30 Break
- 10:30-11:00**12** The Energy-Water Nexus **John Crittenden**
- 11:00-11:30**13** Life Cycle Assessment as a Tool for SE **Deanna Matthews**
- 11:30-12:30 Lunch
- 12:30-1:30 **14** Participants meet in breakout groups to discuss SE tools and metrics pertaining to the topic of the breakout group. Tools such as LCA, CO2 calculators, and mass/energy balances are 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 entire workshop:  
Energy: Room 203, *Cliff Davidson*  
Manufacturing, Materials, & Design: 3<sup>rd</sup> Floor Lounge, *Brad Allenby*  
Structures, Construction, & Infrastructure: 3<sup>rd</sup> Floor Patio, *Deanna Matthews*  
Water & Air Resources: Room 507, *John Crittenden*
- 1:30-2:00 **15** Entire workshop re-convenes. One participant from each breakout group makes a brief presentation on SE tools and metrics from the group.
- 2:00-2:30 **16** NSF funding opportunities in Sustainable Engineering **Deanna Matthews**
- 2:30-3:00 **17** The CSE Electronic Library **Cliff Davidson**
- 3:00-3:30 **18** Wrap-up Session. Workshop evaluations distributed and completed by all participants **Cliff Davidson**
- 3:30 Adjourn; SUNY ESF bio-bus available for airport transport