

Engineering Education Summer Conference

Incorporating Engineering into the K-12 Curriculum

JUNE 17-19 Shaker Heights High School 8:30 AM-3:30 PM

15911 Aldersyde Drive, Shaker Heights 44120

2 CEU CREDITS HANDOUTS/LESSON PLANS \$65/DAY STIPEND

Reservations by June 4

Contact Diane Burrowbridge at: d.burrowbridge@csuohio.edu or 216-687-3617

Engineering is a challenging, highly rewarding (and rewarded) professional career. Shaker Heights City School District and Cleveland State University—through support from the University Transportation Center at CSU—invite you to explore a successful engineering outreach program during a conference hosted at the campuses of both institutions. After attending this three-day summer conference, you will (a) better understand what components comprise an engineering curriculum, (b) receive engineering lesson plans and teaching resources to take back to your classroom, and (c) establish relationships with other education professionals willing to collaborate with you and dedicated to bringing engineering concepts into your K–12 classroom.

Tuesday, June 17

At Shaker Heights High School, Room 275

- | | |
|--------------------|--|
| 8:00-8:30 | Check-in / Refreshments / Stipend Information |
| 8:30-9:45 | Introductions
What is Engineering?; Defining the K-16 Pipeline; The Grant Process |
| 9:45-10:00 | BREAK |
| 10:00-12:00 | “E” – The Forgotten Letter in STEM: Adapting Shaker's Engineering Applications Course to all K-12 grades, presented by Joe Marencik
- Learn how to teach the Engineering Applications Course projects at any grade level, with hands-on group activities.
- Additional discussion on Curriculum, Project Hand-outs, Technical Writing, and Shaker’s online Student Journal of Science and Engineering.

- Examples of student work and getting familiar with the equipment utilized.
- Projects demonstrated include solar ovens, wind generators, fuel cells, wind tunnel testing & robotics, Kaizen bridge building. |
| 12:00-12:45 | LUNCH—provided |

12:45 – 2:45

Continuation of Morning Session

Group Activities continue: More hands-on Engineering Applications Projects and Equipment that include car body design, electronics, Lake Erie lakefront development, and designing your own home. Engineering Short Activity – Tennis Ball Touch

2:45-3:00

BREAK

3:00-3:30

Closing Discussion and questions, tomorrow's activities

Wednesday, June 18

Great Lakes Science Center (GLSC) and Cleveland State University (CSU)

8:00- 8:20

Meet at Shaker Heights High School for bus to Great Lakes Science Center

8:30

Bus departs for Great Lakes Science Center

9:15-11:30

Great Lakes Science Center –Learn about Engineering Activities and Principles

11:30-12:15

LUNCH provided at the GLSC

12:15-12:45

Bus to CSU - Stilwell Hall (Engineering Building)

1:00-3:00

Cleveland State University – Visit Engineering Labs/Presentations by Faculty from the Electrical/Computer Science Engineering Dept. and Civil and Environmental Engineering Dept.

3:00-3:30

Bus returns to Shaker Heights High School

Thursday, June 19

Field Experience

Travel to Cleveland Clinic Lerner Institute/Biomedical Engineering Labs

8:00-8:30

Meet at Shaker Heights High School/ Bus Departs at 8:30

9:30-11:30

Cleveland Clinic Lerner Institute and Biomedical Labs

11:30-12:15

LUNCH at Cleveland Clinic—provided

12:15-1:30

Bus returns to Shaker Heights High School/ short break

1:30-3:00

Open Discussion: Careers in Engineering, “Roadmap to Engineering,” Career Planning, Handouts of various projects, lesson plans, website links for engineering curriculum, field trip ideas.

3:00-3:30

Closing Remarks/Questions/ LPCD Credit and Stipend Information

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Presenters:

Joe Marencik:

Mr. Marencik has worked as a Shaker Heights High School Physics teacher for 18 years. Currently, he teaches AP Physics C, Project Physics, and Engineering Applications. He holds a Bachelor of Science in Physics, a Master of Arts in Curriculum and Instruction, and is currently working on a Doctor of Education in Technology Management. Engaging in the Engineering Pipeline K-16 allows him to better prepare students for post-secondary engineering programs and increased job marketability. In addition to this commitment, Mr. Marencik developed the summer space science camp for the Shaker Heights City School District, for which he transformed a school bus into a space station, built a small working replica of the Sojourner Mars Rover, and devised a full-scale, working replica of the Lunar Rover.

Chin Y. Kuo, PhD:

Dr. Kuo is a Professor in the Civil and Environmental Engineering Department at Cleveland State University. His areas of technical specialty are hydrology, hydraulics, and water resources engineering. Dr. Kuo has published more than one hundred papers, technical reports, and conference proceedings; served as a journal co-guest editor; and worked on editorial boards, as a forum editor, and as a reviewer for journal articles, books, and research proposals. He has also conducted 29 funded research projects in water resources engineering for NSF, NASA, EPA, NOAA, Army Corps of Engineers, Water Resources Research Centers, local and state governments, and industry.

Nigamanth Sridhar, PhD:

Dr. Sridhar is an Assistant Professor in the Department of Electrical and Computer Engineering at Cleveland State University. His primary areas of research interest lie at the intersection of Software Engineering and Distributed Systems, with a special emphasis on small embedded systems such as wireless sensor networks. Dr. Sridhar directs the Dependable Systems and Networks Research Group, which is focused on making programming of sensor systems more accessible to scientists and researchers outside the field of Computer Science. Dr. Sridhar received Ph.D. (2004) and M.S. (2000) degrees in Computer Science and Engineering from The Ohio State University, and an M.Sc.(Tech., 1997) degree in Information Systems from Birla Institute of Technology and Science, Pilani, India. A \$450,000 NSF CAREER Award was awarded to him in 2008.

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REGISTRATION

Deadline: June 4th, 2008

Name of Participant:

Home Address:

City/State:

Zip:

(Home address required to receive Stipend Check)

School District and Building:

Grade Level:

Subjects Taught:

City:

Zip:

Telephone:

Alternate Phone:

Email Address (Very Important):

There is no cost to participants. Please wear comfortable shoes and clothing.

**PLEASE EMAIL/SEND REGISTRATION TO: d.burrowbridge@csuohio.edu
<or>**

**Diane Burrowbridge•Education Coordinator•University Transportation Center
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