2013 Conference:

Current and Future Trends in Engineering and Engineering Technology Education

Hosted by SUNY Buffalo State
Sponsored by USDidactic and Mark Guasteferro

SUNY Buffalo State · 1300 Elmwood Avenue · Buffalo, NY
April 5-6, 2013

Conference Program
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Special thanks to our major sponsor and exhibitor for helping to defray conference expenses.

Mark Guasteferro, Conference Sponsor

Thanks to our exhibitors for supporting the ASEE Conference.
Conference Officials

Conference Chair:

Dr. Kris Schindler, Teaching Assistant Professor
Department of Computer Science & Engineering
University at Buffalo

Conference Co-chair:

Dr. Ilya Grinberg, Professor
Department of Engineering Technology
SUNY Buffalo State

Organizing Committee:

Dr. Shane Rogers, Assistant Professor
Department of Civil and Environmental Engineering
Clarkson University

Dr. Kathryn Dimiduk, Director
Engineering Teaching Excellence Institute
Cornell University

Dr. Michelle Crimi, Associate Professor
Institute for a Sustainable Environment
Clarkson University

Dr. Vladimir Mitin, SUNY Distinguished Professor
Department of Electrical Engineering
University at Buffalo

Special Thanks to the Following Individuals for Their Assistance Organizing the Conference:

Dwight Wardell, Membership Manager, ASEE
Susan Niescier, Technology Department, SUNY Buffalo State
Nicholas Salvatore, Salvatore’s Garden Place Hotel
Student Volunteers from the University at Buffalo
Current Officers, ASEE St. Lawrence Section

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Conference Information

Track Themes
- Trends in Engineering Education
- Increasing Student Interest in STEM Fields
- Undergraduate Research Experiences
- Engineering Education Beyond the Classroom: Internships, Coops, & Global Experiences
- Capstone Design Experiences
- Innovations in Engineering and Engineering Technology Education
- Increasing Student Engagement
- Open Topics in Engineering Education

Conference Registration
Registration is required for all attendees and presenters. Badges are required for admission to all events. Registration fees include admission to the conference banquet and closing reception. Additional banquet tickets may be purchased for $40 per person. Registration is $10 for all students, but does not include the conference banquet. The student rate for the conference banquet is $35 per person.

Registration Hours
The conference registration desk will be located at SUNY Buffalo State on the second floor of the E.H. Butler Library and will be open during the following hours:

- Friday, April 5: 1:00 p.m. – 5:00 p.m.
- Saturday, April 6: 8:00 a.m. – 3:00 p.m.

Hotel Accommodations
Accommodations at a special conference rate are available at the following hotel:

Salvatore’s Garden Place Hotel • 6615 Transit Road • Williamsville, New York • (877) 456-6036
Visit http://www.salvatores.net/the-hotel.html

Conference Proceedings
Conference proceedings will be published on the ASEE St. Lawrence Section website (http://stl.asee.org).

Social Functions

- Pre-Banquet Cocktail Reception (cash bar)
  Salvatore's Garden Place Hotel
  Friday, April 5, 6:00 – 7:00 p.m.

- Conference Banquet (included in registration fee; guests are $40 per person; students are $35 per person)
  Salvatore’s Garden Place Hotel
  Friday, April 5, 7:00 – 9:00 p.m.

- Closing Reception (included in registration fee; students are welcome to attend)
  E.H. Butler Library, SUNY Buffalo
  Saturday, April 6, 4:00 – 5:00 p.m.

Burchfield Penny Art Center & Smart Grid Laboratory Tour
There will be a tour of SUNY Buffalo State’s Burchfield Penney Art Center and Smart Grid beginning at 2:00 p.m. on Friday, April 5. Attendees must register prior to their tour and are required to wear name badges.
Conference Schedule

Friday, April 5, 2013

1:00 – 5:00  Registration Desk Open (E.H. Butler Library, 2nd Floor)
2:00 – 5:00  Burchfield Penny Art Center & Smart Grid Laboratory Tour (Meet in E.H. Butler Library, 2nd Floor)
2:00 – 5:00  Poster Session (E.H. Butler Library, 2nd Floor)
3:00 – 5:00  E.H. Butler Library, hors d’oeuvres
6:00 – 7:00  Pre-Banquet Cocktail Reception (Salvatore’s Garden Place Hotel)
7:00 – 9:00  Conference Banquet (Salvatore’s Garden Place Hotel)
   Dinner Speaker: Mr. Hugh M. Neeson, Western New York Aviation History

Saturday, April 6, 2013

8:00 – 8:45  Registration Desk Open (E.H. Butler Library, SUNY Buffalo State) and continental breakfast
8:45 – 9:00  Opening Remarks (E.H. Butler Library, Room 210)
9:00 – 10:30 Opening Plenary: Integrating ABET Outcomes with Employability Skills (E.H. Butler Library, Room 210)
10:45 – 11:45 Workshops:
   Critical Thinking for Energy Engineering: Safety and Security of the Smart Grid (E.H. Butler Library, Room 210)
   An Innovative Learning and Visualization Environment for Java Grid (E.H. Butler Library, Room 318)
11:55 – 12:55  Conference Luncheon (E.H. Butler Library, Room 210)
1:00 – 2:20  Technical Sessions I
   I.  Capstone Design Experiences (E.H. Butler Library, Room 314)
   II. Innovations in Engineering & Engineering Technology Education (E.H. Butler Library, Room 316)
   III. Increasing Student Interest in STEM Fields/Increasing Student Engagement (E.H. Butler Library, Room 318)
2:30 – 3:50  Technical Sessions II
   I. Trends/Open Topics in Engineering Education (E.H. Butler Library, Room 314)
   II. Capstone Design Experiences & Increasing Student Interest in STEM Fields (E.H. Butler Library, Room 316)
   III. Undergraduate Research Experiences (E.H. Butler Library, Room 318)
   IV. Open Topics in Engineering Education (E.H. Butler Library, Room 318)
4:00 – 5:00  Closing Reception/Social Hour (E.H. Butler Library, Room 210)
Opening Remarks:
Friday, April 5, 2013: 7:00 – 7:15 p.m.
Salvatore's Garden Place Hotel

Dr. Liesel Folks
Dean, School of Engineering and Applied Sciences, University at Buffalo

Dr. Kevin Railey
Associate Provost & Dean, Graduate School, SUNY Buffalo State

Dinner Speaker: Western New York Aviation History
Friday, April 5, 2013: 7:30 – 8:15 p.m.
Salvatore's Garden Place Hotel

Mr. Hugh M. Neeson
Retired Director of Lockheed Martin's Bell Operation supplying Mobile Gravity and Gravity Gradiometers to the International Natural Resources Exploration

Hugh Neeson received his B.S. from Canisius College in 1955 and his MBA from SUNY Buffalo in 1957.

Mr. Neeson was employed by Bell Aircraft/Bell Aerospace Textron from 1955 through 1995 where he as involved with various engineering and program management assignments in Bell's Guided Missile, V/STOL Aircraft and Air Cushion Vehicle Programs. He was promoted to Vice President of Electronics where he oversaw activities in U.S Navy Aircraft Automatic Landing Systems and Inertial System used in the U.S. Navy's Trident II Fleet Ballistic Missile Program. Mr. Neeson retired as Director of Lockheed Martin's Bell Operation supplying Mobile Gravity and Gravity Gradiometers to the International Natural Resources Exploration Industry.

Since retirement in 1999 he has served as Development Director & Trustee of the Niagara Aerospace Museum. He is a Past President of the Aero Club of Buffalo the Lawrence D, Bell Chapter of the Air Force Association. He has served as the President of the Canisius College Alumni Association and as a Regent of College.
**Poster Session**

**Friday, April 5, 2013: 2:00 – 5:00 p.m.**  
E.H. Butler Library, 2nd Floor

- **Xylem Inc. Tapping Machine Redesign**  
  Philip N. Graziadei, Michael Lasker, Justin Scott, SUNY Buffalo State; graziapn01@mail.buffalostate.edu

- **Capstone Design Course and its Role in Meeting TAC/ABET Outcomes**  
  David J. Kukulka, SUNY Buffalo State; kukulkdj@buffalostate.edu

- **Cost effective Enclosure Design for a FS Elliott P500 Compressor**  
  Sharayah L. Walker, S.M Omar Faurk, and Thomas Schneider SUNY Buffalo State; sharayahlwalker@gmail.com

- **The UB Talker: Communication for Everyone**  
  Eric Lehner; ericj@buffalo.edu

**Opening Plenary:** *Integrating ABET Outcomes with Employability Skills*

**Saturday, April 6, 2013: 9:00-10:30 a.m.**  
E.H. Butler Library, Room 210 · SUNY Buffalo State

**Dean C. Millar**

*Director of the Engineering Career Institute & Business Relations*

Dean C. Millar is an Assistant Dean and Director of the Engineering Career Institute and Co-op Programs in the School of Engineering and Applied Sciences at the University at Buffalo, State University of New York. In 1994, following 28 years in industry, he joined UB to start the Engineering Career Institute (ECI), a program that complements engineering coursework with personal and professional skills. This supplementary professional success classwork, plus internship/co-op experience is highly sought by industry, engineering schools’ ABET accreditation, and ultimately, the student’s ability to obtain a good job at graduation. In the past 19 years he has helped over 2500 engineering students launch their careers through the Engineering Career Institute, Internships and Co-op Programs. He has received a SUNY Chancellors Award for Excellence in Professional Service and awards for Positive Influence on Students who were surveyed by UB one year after graduation. Dean Millar is the author of *Ready for Takeoff!—A Winning Process for Launching Your Engineering Career*, published by Pearson/Prentice Hall.
Workshops:

**Critical Thinking for Energy Engineering: Safety and Security of the Smart Grid**

Saturday, April 5, 2013: 10:45 – 11:45 a.m.
E.H Butler Library, Room 210 · SUNY Buffalo State

Mr. William J. Miller
MaCT USA

This is a learning activity to apply critical thinking to the requirements evaluation for energy engineering required for applications of the Smart Grid. This workshop will look at various use cases from the prospective of safety and security. The participants will apply a learning process methodology that can be used in course development and derive the critical questions that will engage learners and facilitate assessment of learner activities. This workshop will discuss recent work at SUNY/Buffalo State College in a new course called FOUNDATIONS IN SMART GRID and how the methodology can be applied to accelerate learner’s retention of information and engagement in a learning process activity. This type of activity can be used at all levels of learning and applied in any area of use. The Smart Grid has many use cases that can be discussed to apply critical thinking from the prospective of safety and security, which have evolved independently. The result is that people and assets are at greater risk since there is a disconnection between in concepts and understanding of the problems. The approach discussed provides a rational and holistic approach to define the requirements applying critical thinking to the problem for energy engineering.

**An Innovative Learning and Visualization Environment for Java**

Saturday, April 5, 2013: 10:45 – 11:45 a.m.
E.H Butler Library, Room 318 · SUNY Buffalo State

Dr. Bharat Jayaraman
Professor of Computer Science & Engineering, University at Buffalo

JIVE is a state-of-the-art interactive learning environment for Java. It can be used as an effective pedagogic teaching and learning tool, and has been used in undergraduate and graduate instruction at UB. JIVE gives insight into the working of a Java program by clarifying the run-time object structure and interaction between objects. Its rich visualizations also help in debugging Java programs. JIVE is available as a plug-in for Eclipse and can be obtained from www.cse.buffalo.edu/jive. It enhances Eclipse's debugging features with interactive visualizations, query-based debugging, dynamic slicing, and forward as well as reverse stepping.
Technical Session I
Saturday, April 6, 2013, 1:00 – 1:20 p.m.

Capstone Design Experiences
E.H. Butler Library, Room 314  Moderator: Shane Rogers
1:00  Product Design for Chemical Engineers
Paschalis Alexandridis, Andrew M. Bodratti, Zhiqi He, Aikaterini Tsoutsoura, Emmanouhl S. Tzanakakis, and Chong Cheng, University at Buffalo; palexand@buffalo.edu

1:20  Optimizing The Effectiveness Of ADCs In The Presence Of Large Unwanted Signals
Paul B. Crilly, United States Coast Guard Academy; uscga.edu

1:40  An Industrial 6-DOF Flight Simulator Via A Multidisciplinary Capstone Senior Design Experience
Jason R. Kolodziej, Larry Hall, Heather Hussain, and Agamemnon L. Crassidis, Rochester Institute of Technology; jrkeme@rit.edu

2:00  Implementing a Capstone Course – It’s Not Always About the Design
James R. Mallory and David L. Lawrence, Rochester Institute of Technology; james.mallory@rit.edu

Innovations in Engineering & Engineering Technology Education
E.H. Butler Library, Room 316  Moderator: Ilya Grinberg
1:00  The Evolution of Student Interaction with an Infinitely Explorable Online Learning System
Franco M. Capaldi, Merrimack College; capaldif@merrimack.edu

1:20  Development of a New Lecture/Lab Course on Electromagnetic Fields and Waves
Vladimir Mitin, Nizami Vagidov, Joseph Zawicki, and Athos Petrou, University at Buffalo; vmitin@buffalo.edu

1:40  Sophomore Engineering Entrepreneurship Education: Goals and Methods
Gautam Pillay, Rowan University; pillay@rowan.edu

2:00  Manhole Access Detection System
Justin Manning, Faly Sy, and Michael Groves, SUNY Buffalo State; mannjm40@mail.buffalostate.edu

Increasing Student Interest in STEM Fields / Increasing Student Engagement
E.H. Butler Library, Room 318  Moderator: Michelle Crimi
1:00  Introducing Computer Programming Using Wearable Technology
Jeanne W. Christman, Rochester Institute of Technology; jxciee@rit.edu
1:20  iLearns: A Student Designed Interactive Learning Environment for Elementary Education
Kris Schindler, Andrew Westcott, Ryan Gudis, Crystal Wong, Vladimir Jovkovski, Thornton Haagwolf, Kayla Weixlmann, Stephanie Brown, Thomas Sabbag, Jonathan Yung, Brian Haag, Steven Ostertag, Troy Koss, Louissa Grizzard, University at Buffalo; kds@buffalo.edu

1:40  Community-Based Engineering Project: Core Theme in First-Year Engineering Seminar
Karinna M. Vernaza, Kasey Cyrus, Matthew McCarthy, Robert DiPlacido; Gannon University; vernaza001@gannon.edu

2:00  Biomass Processing with Green Chemistry for a Sustainable Future: Getting K-12 Students Excited about Chemical Engineering
Michelle A. Reele, Mohammad Ghasemi, Marina Tsianou, and Paschalis Alexandridis
Department of Chemical and Biological Engineering, University at Buffalo
Technical Session II
Saturday, April 6, 2013, 2:30 – 3:50 p.m.

Trends/Open Topics in Engineering Education
E.H. Butler Library, Room 314  Moderator: Kathryn Dimiduk

2:30  Experiential Learning for Honors Freshman Engineers: Concepts and Methods
Gautam Pillay, Rowan University; pillay@rowan.edu

2:50  Opening the Door for non-traditional students: Building a Direct Educational Path from Operations to Management in the Nuclear Industry
Samantha J. Henrikson, Andrew PG Wheeler, and Adrian M. Skinner, Excelsior College; shenrikson@excelsior.edu

3:10  Connect Engineering: A Comprehensive Online, Learning, and Assessment Solution
Lynne M Niclair, McGraw-Hill Higher Education; lynne_niclair@mcgraw-hill.com

3:30  Development of Undergraduate Power Engineering Teaching and Learning for future smart grid
T. Bujanovic, M. N. Mojdehi, L. Sun, P. Ghosh and C. Mohan, Syracuse University; tbujanov@syr.edu

Capstone Design Experiences & Increasing Student Interest in STEM Fields
E.H. Butler Library, Room 316  Moderator: Ilya Grinberg

2:30  Chem-E Car Racing Helps Chemical Engineering Undergraduates Apply Science and Engineering Principles and Develop Professional Skills
Michelle A. Reele and Marina Tsianou, University at Buffalo; mtsianou@buffalo.edu

2:50  CAPSTONE DESIGN: AN ENTREPRENEURIAL MIND SET APPROACH
Sabah Abro and Ken Cook, Lawrence Tech University; sabro@ltu.edu

3:10  Foundations in Smart Grid; a course to develop Technological Literacy
Steve M. Machos and Ilya Grinberg, SUNY Buffalo State; Machos@buffalostate.edu

Undergraduate Research Experiences
E.H. Butler Library, Room 210  Moderator: Shane Rogers

2:30  Turning to Suspension for Success
Eugenia Episcopo, Zachary Sutton, Patrick Daigler, Richard Fedele, Christopher Blakowski, and Steven Czekowski, SUNY Buffalo State; epise28@mail.buffalostate.edu

2:50  Undergraduate Student-Led Research and Development of an Electric Vehicle Charging System
Joseph Calogero, Gautam Pillay, Ryan Bandura, Adam Wentzel, Charlotte Cecere, and Steven Rieger, Rowan University; caloge46@students.rowan.edu
3:10  Control Panel Mounting System with Vibration Isolation  
Bill H. Gross and Tom Poppenberg, SUNY Buffalo State; grosswhol@mail.buffalostate.edu

3:30  Revitalizing Engineering Education through Practical Applications of Advance Energy Systems  
Kang Wang, Ryan Falkenstein-Smith, and Jeongmin Ahn, Syracuse University; rlfalken@syr.edu

Open Topics in Engineering Education  
E.H. Butler Library, Room 318  
Moderator: Michelle Crimi

2:30  Alternative Approaches to Assessing ETAC of ABET Student Outcome Criteria  
Anthony P. Dalessio, Katherine H. Hill, Matthew M. Best, and Elena V. Brewer; dalessio@ecc.edu

2:50  TiPi Scholars’ Program for Transfer Students from Two-Year Colleges  
Surendra Kumar Gupta, Vincent J. Amuso, Daniel P. Johnson, Michael G. Eastman, and John Morelli, Rochester Institute of Technology; skgeme@rit.edu

3:10  Through the Systems Curriculum via Mobile App Development  
Robert J. Irwin, Syracuse University; rjirwin@syr.edu

3:30  Development of an Incremental Digital ‘Digital Badge’ Approach to Professional Certification  
John J. Earshen, SUNY Buffalo State; earshenjj@buffalostate.edu