



## St. Lawrence Section

THE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

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

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## 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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## Chair:

**Dr. Shane Rogers**, Assistant Professor  
Department of Civil and Environmental Engineering  
Clarkson University  
**E-mail:** srogers@clarkson.edu

## Secretary:

**Dr. Ilya Grinberg**, Professor  
Engineering Technology Department  
SUNY Buffalo State  
**E-mail:** grinbeiy@buffalostate.edu

## Chair-Elect:

**Dr. Kris Schindler**, Teaching Assistant Professor  
Department of Computer Science And Engineering  
University at Buffalo, The State University of New York  
**E-mail:** kds@buffalo.edu

## Awards Committee Chair:

**Dr. Michelle Crimi**, Associate Professor  
Institute for a Sustainable Environment  
Clarkson University  
**E-mail:** mcrimi@clarkson.edu

## Treasurer:

**Dr. Kathryn Dimiduk**, Director  
Engineering Teaching Excellence Institute  
Cornell University  
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## Past Chair:

**Dr. Vladimir Mitin**, SUNY Distinguished Professor  
Department of Electrical Engineering  
University at Buffalo  
**E-mail:** vmitin@buffalo.edu

## Webmaster:

**Dr. Kris Schindler**, Teaching Assistant Professor  
Department of Computer Science And Engineering  
University at Buffalo  
**E-mail:** kds@buffalo.edu

# 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, 2<sup>nd</sup> Floor)
- 2:00 – 5:00** Burchfield Penny Art Center & Smart Grid Laboratory Tour (Meet in E.H. Butler Library, 2<sup>nd</sup> Floor)
- 2:00 – 5:00** Poster Session (E.H. Butler Library, 2<sup>nd</sup> 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 210)
- 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, 2<sup>nd</sup> 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

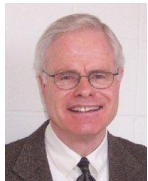
The UB Talker: Communication for Everyone

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](http://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.

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## 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

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## 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

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## 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. Reece, Mohammad Ghasemi, Marina Tsianou, and Paschalis Alexandridis  
Department of Chemical and Biological Engineering, University at Buffalo
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# Technical Session II

Saturday, April 6, 2013, 2:30 – 3:50 p.m.

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## 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

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## 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. Reece 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

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## 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
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### **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

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## Notes

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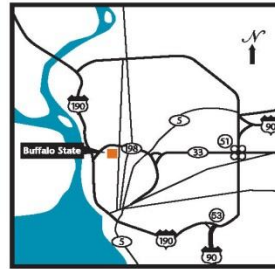
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# SUNY Buffalo State Campus Map



**BUFFALO STATE**  
The State University of New York

1300 Elmwood Avenue • Buffalo, NY 14222-1095  
(716) 878-4000 • www.buffalostate.edu

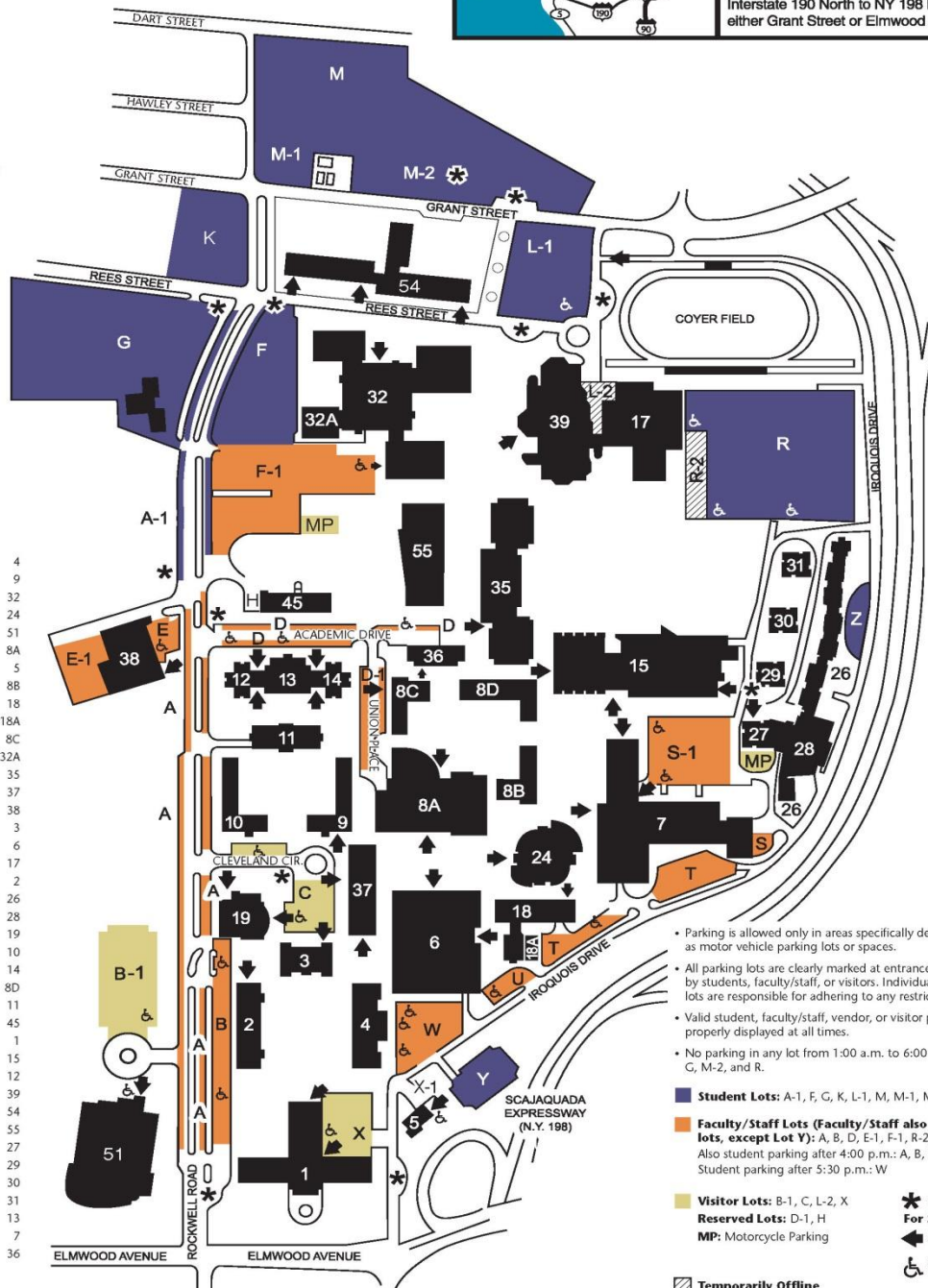


## How to get to Buffalo State by car:

**From the east (via the NYS Thruway/Interstate 190):** Take Exit 51 (NY 33 West) to NY 198 West. Exit NY 198 at Elmwood Avenue South. The college is immediately on the right. **From the west or south (via the NYS Thruway/Interstate 190):** Take Exit 53 (Interstate 190) to NY 198 East; exit at either Grant Street or Elmwood Avenue. **From the north/Niagara Falls:** Take Interstate 190 South (over the Grand Island Bridge) to NY 198 East; exit at either Grant Street or Elmwood Avenue. **From the Peace Bridge/Canada:** Take Interstate 190 North to NY 198 East; exit at either Grant Street or Elmwood Avenue.

## Map Legend

Bacon Hall	4
Bishop Hall	9
Buckham Hall	32
Bulger Communication Center	24
Burchfield Penney Art Center	51
Campbell Student Union	8A
Campus House	5
Cassidy Hall	8B
Caudell Hall	18
Caudell Hall Annex	18A
Chase Hall	8C
Child Care Center	32A
Classroom Building	35
Cleveland Hall	37
Clinton Center	38
Donald Savage Building	3
E. H. Butler Library	6
Houston Gym	17
Ketchum Hall	2
Moore Complex	26
Moore Hall	28
Moot Hall	19
Neumann Hall	10
North Wing	14
Perry Hall	8D
Porter Hall	11
Power Plant	45
Rockwell Hall	1
Science and Mathematics Complex	15
South Wing	12
Sports Arena	39
Student Apartment Complex	54
Technology Building	55
Tower 1	27
Tower 2	29
Tower 3	30
Tower 4	31
Twin Rise	13
Upton Hall	7
Weigel Health Center	36



- Parking is allowed only in areas specifically designated as motor vehicle parking lots or spaces.
- All parking lots are clearly marked at entrances for proper use by students, faculty/staff, or visitors. Individuals using parking lots are responsible for adhering to any restrictions.
- Valid student, faculty/staff, vendor, or visitor permits must be properly displayed at all times.
- No parking in any lot from 1:00 a.m. to 6:00 a.m. except in lots C, M-2, and R.
- Student Lots:** A-1, F, G, K, L-1, M, M-1, M-2, R, Y, Z
- Faculty/Staff Lots (Faculty/Staff also can park in student lots, except Lot Y):** A, B, D, E-1, F-1, R-2, S, S-1, T, U, W  
Also student parking after 4:00 p.m.: A, B, D, F-1, R-2, S-1, T, U  
Student parking after 5:30 p.m.: W
- Visitor Lots:** B-1, C, L-2, X
- Reserved Lots:** D-1, H
- MP:** Motorcycle Parking
- Temporarily Offline**
- Bus Services**
- For Special Needs:**
  - Accessible Entrances
  - Accessible Entrances
  - Parking Spaces