

A “Boot Camp” Experience in Sustainable / Alternative Energies at Rose-Hulman Institute of Technology

Funded by: STEM Teach Indiana

Hosted by: The PRISM Project

Rose-Hulman PRISM will be facilitating A “Boot Camp” Experience in Sustainable / Alternative Energies on the RHIT campus. This is a residential program for 4th – 12th grade Indiana teachers of science, mathematics, and technology / pre-engineering interested in learning content knowledge, pedagogy, and practical applications of sustainability / alternative energies. Topics covered include current state of energy and production (including the U.S. power grid / distribution systems), solar technologies, geothermal, nuclear, hydro, biomass, wind, and other emerging sources, as well as social action and public policy for influencing conservation.

During the institute, teachers are to be developing standards-based, practical and comprehensive lessons for units on sustainable alternative energies. Time will be given each day to help guide the development of lesson plans. Teachers will also be given time to share their ideas and collaborate each day. All participants have free use of PRISM’s Learning Management System (Moodle) in their classrooms, as well as access to a curated library of energy-related digital resources and contributed lesson plans from previous Boot Camp participants.

Room and board is at no cost. All participants are housed in a modern residence hall (single occupancy, with ensuite bath and kitchenette) on the RHIT campus during the on-site workshop. Meals are provided in the campus dining room (Bon Appetit food service). Participants are responsible for travel costs to the RHIT campus.

Teachers completing the *Boot Camp* receive 45 Professional Growth Plan (PGP) points. This workshop can also count toward at least 15 hours of professional development related to work force needs. Teachers will also receive a new iPad. Industry experts at each production facility give in-depth plant tours and career awareness information.

Eligibility Requirements:

- Teachers must be active Indiana STEM teachers teaching units on sustainable energies in grades 4-12.

Main Topics

U.S. Power Grid
Energy Conservation
Solar Energy
Wind Energy
Coal-fired Power Plants
Natural Gas Combined-Cycle Power Plants

Site visits could include:

Hoosier Energy Merom Power Plant, Merom, IN
MISO Headquarters, Carmel, IN
Sheridan Community Schools, Sheridan, IN
NIPSCO Sugar Creek Generating Station, W. Terre Haute, IN
Benton County Wind Farm, Fowler, IN

Apply online at: [STEM Teach Indiana](#)

PRISM Team Members:

Dr. Patricia Carlson, Project Director & Principal Investigator
Ryan Smith, System Administrator & PRISM Project Lead

Bob Jackson, K-12 Educational Liaison



hosted by



(Tentative)

2020 Sustainable Energy Summer Institute

funded by STEM Teach Indiana

A “Boot Camp” Experience in Sustainable Alternative Energies Tentative Schedule

Sunday Orientation / Room Check In

TIME	ACTIVITY	Room
5:30 – 6:15 PM	Registration	Mussallem Union
5:45 – 6:15 PM	Make Your Own Deli Sandwich	HMU 265 Heritage Room
6:20 – 6:30 PM	Opening Remarks – Dr. Patricia Carlson	Mussallem Union HMU 265 Heritage Room
6:30 – 7:00 PM	Rose-Hulman Guest Speaker	Mussallem Union HMU 265 Heritage Room
7:15 – 7:30 PM	Room Check-In	Lakeside Residence Hall

DAY ONE: Monday Theme: U.S. Power Grid / Energy Conservation / Hydropower

TIME	ACTIVITY	Room
7:45 AM	Light Breakfast	Myers M111
8:00 – 8:50 AM	Introductions / Plans for the Week / Organization / Moodle Courses	Myers M111
9:00 – 9:55 AM	Dr. Andrew Mech, Professor of Mechanical Engineering U.S. Power Grid / Energy Conservation	Myers M111
9:55 – 10:00 AM	Break	
10:00 – 10:40 AM	Moodle Training / Course Setup	Myers M11
		Myers

(Tentative)

10:45 – 11:20 AM	Lab Activity: Home Energy Audit / Light Bulbs / Kill-A-Watt Meters	M107
11:30 – 12:10 PM	Lunch	Mussallem Union
12:10 – 1:00 PM	Dr. Andrew Mech, Professor of Mechanical Engineering Hydropower	Myers M107
1:00 – 1:20 PM	Dr. Andrew Mech, Professor of Mechanical Engineering Hydropower Demonstrations	KIC
1:30 – 2:20 PM	Guest Speaker – Dr. Robert Bunch, Professor of Physics and Optical Engineering and Innovation Fellow. – Lighting / Energy Conservation	Myers M111
2:20 – 2:40 PM	Break	
2:45 – 5:15 PM	Lab Activity: Finish Energy Audit / Light Bulbs Start Solar Cell Lab	Myers M107
5:15 – 5:30 PM	Challenge Question: How are you going to integrate the U.S. Power Grid and Energy Conservation and Hydropower concepts and activities into your curriculum? Assignment: Develop a Units/Subunits on the U.S. Power Grid, Energy Conservation and Hydropower. Add resources to a Moodle course.	Myers M111
5:30 PM	Dinner	Mussallem Union

DAY TWO: Tuesday
Theme: Coal-Fired Power Plants

TIME	ACTIVITY	Room
7:45 AM	Light Breakfast	Myers M111
8:00 – 8:50 AM	Reflection Time: How are you going to integrate the U.S. Power Grid, Energy Conservation and Hydropower concepts and activities into your own curriculum?	Myers M111
9:00 – 9:55 AM	Dr. Andrew Mech, Professor of Mechanical Engineering Coal-Fired Power Plants	Myers M111
9:55 – 10:00 AM	Break	
10:00 – 11:30 AM	Lab Activity: Windmills / Windmill Math	Moench F101

(Tentative)

11:30 – 12:10 PM	Lunch	Mussallem Union
12:15 – 1:00 PM	Travel/Site Visit to Hoosier Energy’s Merom Power Plant Kriss Miller, Manager of Regulatory Compliance, kmiller@HEPN.com ; Becky Cox, Information Coordinator, BECKYCOX@HEPN.com	Merom, IN
1:00 – 3:30 PM	Merom Power Plant presentation and tour of facility.	Merom, IN
3:30 – 4:30 PM	Drive time back to Rose-Hulman	
4:30 – 5:30 PM	Lab Activity: Finish Windmills / Windmill Activities Discuss Windmill Math Lessons	Myers M107
5:30 PM	Challenge Question: How are you going to integrate Coal-fired Power Plant concepts into your curriculum? Assignment: Develop a Unit/Subunit on Coal-fired power plants. Add resources to a Moodle course.	Myers M111
5:30 PM	Dinner	Mussallem Union

DAY THREE: Wednesday
Theme: Solar Energy / MISO Grid Management

Time	Activity	Room
7:45 AM	Light Breakfast	Myers M111
8:00 – 8:50 AM	Reflection time: How are you planning to effectively integrate Coal-fired Power Plants into your current curriculum?	Myers M111
9:00 – 9:55 AM	Dr. Andrew Mech, Professor of Mechanical Engineering Solar Energy	Myers M111
10:00 – 11:20 AM	Guest Speaker: Dr. Robinson / John Aidoo – Catapult Tour	Myers M111
11:00 – 11:50 PM	Lunch	Mussallem Union

(Tentative)

12:00 – 1:30 PM	Drive to MISO, Carmel, IN	
1:30 – 2:30 PM	Talk and tour of MISO. Contact: Emily Kahren, EKahren@misoenergy.org	Carmel, IN
12:30 – 3:00 PM	Drive to Sheridan Community Schools	Sheridan, IN
3:00 – 4:30 PM	Talk and tour of the solar arrays at Sheridan Community Schools – Middle / High School and Elementary Schools	Sheridan, IN
4:30 – 6:30 PM	Drive time back to Rose-Hulman campus.	
	<p>Challenge Question: How are you going to integrate solar energy (and MISO) into your current curriculum?</p> <p>Evening Assignment: Develop a Unit / Subunit on Solar Energy and MISO. Add resources to a Moodle course.</p>	Myers M111
	Dinner will not be provided at Bon Appetit this evening. They close before we can get back from Sheridan Community Schools. Participating teachers will need to make plans on their own on this evening for dinner. We will gladly suggest good places in town.	
<p>DAY FOUR: Thursday Theme: Combined-Cycle Gas Power Plants</p>		
TIME	ACTIVITY	Room
7:45 AM	Light Breakfast	Myers M111
8:00 – 8:50 AM	Reflection Time: How can the Solar Energy and MISO concepts and activities be integrated into your current curriculum effectively?	Myers M111
9:00 – 9:55 AM	Dr. Andrew Mech, Professor of Mechanical Engineering Combined-Cycle Gas Power Plants	Myers M111
9:55 – 10:00 AM	Break	
10:00 – 11:30 AM	Lab Activity: Wind and Solar Energy Problems for Students Finish up all lab activities.	Myers M111

(Tentative)

11:30 – 12:00 PM	Drive time to NIPSCO	Darwin Road, WTH
12:00 – 12:30 PM	Lunch at NIPSCO	Darwin Road, WTH
12:30 – 3:00 PM	NIPSCO conference room at the plant. Contacts: Darrell Boyll, Plant Manager, dboyll@nisource.com ; Donnie Maffioli, Plant Superintendent, DMaffioli@nisource.com and Karen McCoy, Public Relations Rep., KarenMcCoy@nisource.com Heather Rollins, hrollins@nisource.com	Darwin Road, WTH
3:00 – 3:30 PM	Travel time to Rose-Hulman.	
3:30 – 5:00 PM	Lab Activity: Economics of Wind, Solar, and other alternative energy sources. Pack up kits for teachers. Clean up Labs and Pack Up Kits.	Myers M111 Moench F101
5:00 – 5:15 PM	Challenge Question: How are you going to integrate combined-cycle power plants into your current curriculum? Evening Assignment: Develop a Unit / Subunit on Combined Cycle Power Plants. Add resources to a Moodle course.	Myers M111
5:30 PM	Dinner	Mussallem Union

DAY FIVE: Friday

Theme: Wind Energy

TIME	ACTIVITY	Room
7:45 AM	Light Breakfast	Myers M111
8:00 – 8:30 AM	Reflection Time: How can Combined-Cycle Gas Power Plants be integrated into your current curriculum effectively?	Myers M111
9:00 – 9:55 AM	Dr. Andrew Mech, Professor of Mechanical Engineering Wind Energy	Myers M111

(Tentative)

10:00 – 10:55 AM	Chad Weber, Director of Facilities	Myers M111
11:00 – 11:30 AM	Surveys / Evaluations	Myers M111
11:30 – 12:10 PM	Lunch	Mussallem Union
12:15 – 1:45 PM	Drive time to Benton County	
1:45 – 4:00 PM	Benton County Wind Farm Presentation and Tour Contacts: Jenny Wilson, Administrative Asst. Benton County Economic Development, JWilson@bentoncounty.in.gov	Benton County, IN
4:00 – 5:30 PM	Travel time back to Rose-Hulman	
~ 5:30 PM	Wrap Up and Check Out	Myers M111