

Energy Education

Summary of Energy Education Activities throughout the Commonwealth
Facilitated by Institutes of Energy and the Environment – Winter 2021



PennState

Commonwealth Campus

Summary of Energy Education Activities

Dean: Madlyn Hanes

Summary Slide Prepared by: Joe Cuiffi (NK), Joe Ranalli (HN), Laura Guertin (BW), Eric Lipsky (GA), Tai-Yin Huang (LV)

Program	Description	Campus
Clean Energy Smart Manufacturing Innovation Institute	The “Factory 4.0 Toolkit”, a CESMII, sponsored program, that provides educational activities for undergraduates and current workforce on smart manufacturing and energy efficiency optimization.	New Kensington (NK)
BS Engineering – Alternative Energy and Power Generation Option	Undergraduate major focused on alternative energy systems and power transmission. Energy and Sustainability focus in our Undergraduate Research, Senior Design Projects and Industry Guest Lecture Series. The PSU Hazleton Science and Engineering Club often does energy related activities. Several faculty perform research in solar energy and battery storage.	Hazleton (HN)
Earth 104N (Climate, Energy and Our Future). #InstaEnergyStory: Undergraduate Projects	Students crafted stories about an energy topic, along with an image they created in Adobe Spark. Also emphasizes sharing energy knowledge and public communication.	Brandywine (BW)
B.S. in Energy Engineering (ENENG-GA 3+1)	Alternate 3+1 pathway for students seeking B.S. Energy Engineering at University Park. Courses include: EGEE302 – Introduction to Energy Engineering,; AE 469: Photovoltaic Systems Design and Construction; EGEE 437 : Design of Solar Energy Conversion Systems; EGEE 438 : Wind and Hydropower Energy Conversion. Faculty research in <i>Electrocatalytic Conversion of Waste to Fuels</i>	Greater Allegheny (GA)
Integrated Energy Solutions for Entrepreneurs (IESE) - http://sites.psu.edu/iesepslv	Offers research opportunities to students in the area of energy efficiency. Examples include: platform dependent energy efficiency of computer coding, optimization of light wavelengths for plants, solar panel efficiency with weather variations, and green energy trends in construction.	Lehigh Valley (LV)

*This is a [non](#) exhaustive list intended to promote energy education conversation only.

Penn State Behrend

Summary of Energy Education Activities

Dean: Ralph Ford
Summary Slide Prepared by: Greg Filbeck

Certificates	Other Activities
Certificate Program in Energy Finance (https://bulletins.psu.edu/undergraduate/colleges/behrend/energy-finance-certificate/#programrequirements)	Certificate includes Introduction to Energy Finance (FIN 418) course, an elective in the BS in Finance from Penn State Behrend

*This is a non exhaustive list intended to promote energy education conversation only.

Penn State Harrisburg

Summary of Energy Education Activities

Dean: John Mason

Summary Slide Prepared By: Richard Ciocci and Paul Hallacher

Majors	Courses
BS in Electrical Engineering/Electrical Engineering Technology	Power System Analysis I (EET 409) Power System Analysis I (EE 488, 4 Credit Lab Course) Power System Analysis II (EET 410) Power System Analysis II (EE 489, 4 Credit Lab Course) Power Electronics (EE 413) Energy Systems and Conversion (EE 485) Power Systems Control and Operations (EE 488) Smart Grid Control and Dynamics (EE 489) Microgrid Laboratory Internship in Power Engineering (SSET 295)
MSC/MSEE in Electrical Engineering	Smart Grid Control and Dynamics (EE 589)
MSC/MSEE in Electrical Engineering	Power System Operation and Control (EE 588)
BS and MS in Mechanical Engineering/Mechanical Engineering Technology	Energy Systems (ME 408) Building Energy Systems (MET 435) Energy Conversion Systems (MET 436)
Master of Engineering Management (Penn State Great Valley)	Engineering for Energy and the Environment (ENGMT 511)

*This is a [non](#) exhaustive list intended to promote energy education conversation only.



PennState

ENERGY UNIVERSITY FORUM: ENERGY EDUCATION

Penn State School of International Affairs

Summary of Energy Education Activities

Dean: Hari Osofsky

Summary Slide Prepared by: Scott Gartner and Elizabeth Ransom

Majors	Certificates	Clubs & Competitions	Other Activities
Graduate Concentration in International Energy Policy	Graduate Certificate in International Affairs, Graduate Certificate in International Security Studies	School career trip to the US Energy Association	Associate Director, Initiative for Sustainable Energy Policy (ISEP), Johns Hopkins University (Peng)
Elective course offerings: <i>Energy, International Security, and the Global Economy; U.S. Policy in the Middle East; and Science, Technology, and International Policy</i>			Co-director, <u>Center for Climate Risk Management</u> , Earth and Environmental Systems Institute (Peng)
			Placement of students in energy related internships, including: World Future Council, Geneva; Water Resources Action Project, with THG Advisors, Plymouth, MA; Drawdown Institute, University Park.
			Placement of students in energy-related careers and organizations: US Nuclear Regulatory Commission; Japan Science and Technology Agency, Tokyo; Turkish Petroleum Corporation, Ankara; Ministry for investments and Development, Kazakhstan; King Fahd University of Petroleum and Minerals, Saudi Arabia.
*This is a <u>non</u> exhaustive list intended to promote energy education conversation only.			



Earth and Mineral Sciences

Summary of Energy Education Activities

Dean: Lee Kump

Summary Slide Prepared by: Zuleima Karpyn

Majors	Minors	Certificates	Clubs & Competitions	Other Activities
BS in Energy Engineering; Petroleum and Natural Gas Engineering; Mining Eng	UG minor in Energy Eng; Petroleum and Natural Gas Eng; Mining Eng	Graduate certificate in sustainability management and policy (online)	Society of Energy Engineers	Energy for the future seminar series
BS in Energy Business and Finance	UG minor in Energy Business and Finance	Graduate certificate in solar energy (online)	Society for Energy Business and Finance; Penn State Energy Marketing Association	Energy and Mineral Engineering Research showcase
BS in Meteorology and Atmospheric Science, option in Weather Risk Management	UG minor in Electrochemical engineering		Weather Risk Management student club	Multiple UG Energy and Geo-environmental engineering courses
MPS in Renewable Energy and Sustainability Systems (online)	Graduate minor in Electrochemical science and engineering		Society of Petroleum Engineers; Mining Society	METEO 561: The Global Carbon Cycle; METEO 332N: Science and Policy of Greenhouse Gas Emissions
MS & PhD in Energy and Mineral Engineering with options in: ESysE, FSc, MMPE, PNGE				

*This is a [non](#) exhaustive list intended to promote energy education conversation only.



PennState

ENERGY UNIVERSITY FORUM: ENERGY EDUCATION

Penn State Law in University Park

Summary of Energy Education Activities

Dean: Hari Osofsky

Summary Slide Prepared by: Hannah Wiseman, Ross Pifer, Lara Fowler, Jill Engle, Dan Walters

Majors	Clubs & Competitions	Other Activities
<p>Courses in Energy Law & Policy, Climate Law, Land Use (energy siting issues), Oil and Gas, Shale Law and Policy</p> <p>Joint course in Energy Transitions with Earth & Mineral Sciences</p> <p>Planned courses in Energy Infrastructure and Renewable Energy/Energy Justice</p>	<p>Environmental Law Society</p> <p>Several students have received competitive scholarships from Energy & Mineral Law Foundation</p>	<p>Rocky Mountain Mineral Law Foundation constituent law school (draft application pending)</p> <p>Energy & Mineral Law Foundation member</p> <p>Numerous outreach presentations on solar leasing and regulation issues</p> <p>Weekly publication of <i>Shale Law Weekly Review</i> addressing emerging legal developments</p> <p>Variety of legal resources are maintained on the website for the Center for Agricultural and Shale Law – aglaw.psu.edu</p> <p>Center for Energy Law and Policy</p>

*This is a [non](#) exhaustive list intended to promote energy education conversation only.



PennState

ENERGY UNIVERSITY FORUM: ENERGY EDUCATION

Bellisario College of Communication

Summary of Energy Education Activities

Dean: Marie Hardin

Summary Slide Prepared by: Lee Ahern

Certificates	Other Activities
<p>Science Communication module for STEM graduate majors. Developed by science communication expert Matt Swayne as part of his master's thesis, this flexible, four-module Canvas course can be strategically added to appropriate STEM majors across the university to ensure students have some exposure to the study and practice of science communication.</p>	<p>Science Communication research collaborations; Undergraduate focus in science communication</p>

*This is a non exhaustive list intended to promote energy education conversation only.



PennState

ENERGY UNIVERSITY FORUM: ENERGY EDUCATION

College of Engineering, University Park

Summary of Energy Education Activities

Dean: Justin Schwartz

Summary Slide Prepared by: Peter Butler & Susan Stewart

Majors & Certificates	Example Courses	Clubs & Competitions
Wind Energy Graduate Certificate	AERSP 583: Wind Turbine Aerodynamics AERSP 880: Wind Turbine Systems AERSP 886: Engineering of Wind Project Development	Wind Energy Club Collegiate Wind Competition
Architectural Engineering	AE 456: Solar Energy Building System Design AE 551: Combined Heat and Power System Design for Buildings AE 553: Building Energy Analysis AE 878: Solar Project Development and finance AE 880: Facility Energy Management	Solar Decathlon/Race to Zero Green Energy Challenge, National Electrical Contractors Association
Chemical Engineering	CHE 220 Intro to CHE Thermo CHE 320 Phase and Chemical Eq. CHE 423 Chemical Energy Tech.	Engineers for a Sustainable World Hybrid Electric Vehicle Team
Engineering Science	ESC 501: Solar Cell Devices	Women in Nuclear
Mechanical Engineering	ME 408: Energy Systems ME 400: Thermodynamics of Propulsion and Power Systems ME 551: High Power Energy Storage ME 552: Optimal Control of Energy Systems	
Nuclear Engineering	NUCE 302: Introduction to Reactor Design	



PennState

*This is a [non](#) exhaustive list intended to promote energy education conversation only.

ENERGY UNIVERSITY FORUM: ENERGY EDUCATION