

## PHYS 6030 Syllabus - 2015

Class Day	Date	Day of Week	Session	Title	Reading Assignment Chapter (Sects)	Homework Videos	Homework Due
1	Sept. 7	M	1	Why is Energy Important?	1-1, 1-2, 1-3	<i>Powering the Planet</i> . 54 minute video. Two files.	
2	Sept. 9	W	2	The Issues and Challenges of Energy	1-3 to 1-7	<i>Switch</i> . 98 min video. Three files.	
3	Sept. 11	F	3	Fossil Fuels	4-1 to 4-3	<i>Why is the US Dependent of Fossil Fuels?</i> video <i>Fossil Rock Anthem</i> video <i>BP US Energy Outlook 2035: America's Energy Future-2014</i> video BP <i>Energy Outlook 2035: A view from 2014</i> video <i>How Fossil Fuels are Greening the Planet</i> video	
4	Sept. 14	M	4	Coal Production	4-4A	<i>Coal Mining Documentary</i> video	HW 1
5	Sept. 15	W	5	Oil Production	4-4BCD	<i>Petroleum: Geology &amp; Exploration</i> video; <i>New Oil and Gas Exploration</i> video; <i>Oil and Gas Wells - Start to Finish</i> video;	
6	Sept. 18	F	6	Alternative Oil Sources	4-4E	<i>Shale Oil-The Rush for black Gold</i> ; <i>Canada's Oil Sands - Come see for yourself</i> ; <i>The Story of the Alberta Sands</i> ; <i>Colorado State of Mind: Oil Shale Extraction in Colorado</i> ; <i>The Lifecycle of an Onshore Well</i> ; <i>Fracking Hell: The Untold Story</i> ; <i>Oil and Ice: The Risks of Drilling in Alaska's Arctic Ocean</i> ;	
7	Sept. 21	M	7	Natural Gas, Pipelines, Refining	4-4FGH	<i>A History of Natural Gas</i> ; <i>CNG 101: An Introduction to Compressed Natural Gas</i> ; <i>The Bloom Box</i> ; <i>Bloom Energy</i> ; <i>Ceramic Fuel Cells BlueGen SOFC</i>	HW 2
8	Sept. 23	W	8	Consumption, Production, Reserves	4-5		

9	Sept. 25	F	9	Fossil Fuel Finale; Carbon Emissions	4-6	<i>The Greenhouse Effect, Types of Greenhouse Gases; The Skeptic's Case about Climate Change; Carbon Capture; Carbon Capture and Storage; Smoke Precipitator (optional); Carbon Tax and Cap and Trade; The Story of Cap and Trade; Twin Sides of the Fossil Fuel Coin.</i>	
10	Sept. 28	M	10	Work and Energy	2-1 to 2-5		HW 3
11	Sept. 30	W		<b>Midterm Exam 1 Sessions 1-9</b>			
12	Oct. 2	F	11	Heat and Temperature; Ideal Gas Law	2-6 to 2-8	<i>Heat Exchange</i> video	
	Oct. 5	M		No Class - Reading Days			
13	Oct. 7	W	12	Thermodynamics and Heat Engines	2-9 to 2-11	<i>Animated Engines</i>	HW 4
14	Oct. 9	F	13	Electricity	3-1 to 3-4		
15	Oct. 12	M	14	Magnetism	3-5 to 3-7	<i>Magnetism: Motors and Generators</i> video; <i>Thermal Energy from Ontario; Electricity _FossilFuels ; Energy 101: Electricity Generation ;</i>	
16	Oct. 14	W	15	Hydropower	5-1	<i>SmallHydroPower; Hydropower: an introduction; (US Corps Engineers)</i>	<i>Hydropower</i> HW 5
17	Oct. 16	F	16	Solar Power Basics	5-2	<i>The Basics of Solar Energy - From the Green Economy</i>	
18	Oct. 19	M	17	Concentrated Solar Power	5-3	<i>Concentrated Solar Thermal with Molten Salt Storage; Solar Reserve Concentrated Solar Power Technology</i>	HW 6
19	Oct. 21	W	18	Photovoltaics	5-4	<i>SolarEnergy/SolarPhotovoltaicEffect (3D animation) SolarPowerBasics from PacificEnergyCenter</i>	
20	Oct. 23	F	19	Wind Power Basics	6-1 to 6-4	<i>Easiest Homemade Windmill Plans for Wind Power; Homemade Wind Generator; Mini WindTurbine</i>	
21	Oct. 26	M	20	Wind Turbine Placement	6-4 to 6-6	<i>What's Inside a Wind Turbine; For Wind Energy's Future, Reaserachers look High in the Sky</i>	HW 7

22	Oct. 28	W	21	How Wind Turbines Operate	6-6 to 6-10 Skim 6-7		
23	Oct. 30	F	22	Geothermal Option	7-1	<i>Alternate Energy Sources.</i> <i>What is Geothermal Heating?</i>	HW 8
24	Nov. 2	M	23	Geothermal Energy	7-1	<i>NordicDeepHeat;</i> <i>Geothermal Energy in Iceland;</i> <i>Geothermal Energy, driving an Italian town.</i>	
25	Nov. 4	W	24	Bioenergy	7-2	<i>25 MW Biomass Plant</i> <i>Biomass Fuels Energy Supply</i> <i>Energy from Biomass</i> <i>NREL Research on Converting Biomass to Liquid Fuels;</i> <i>The Global Biofuel Disaster.</i>	
26	Nov. 6	F	25	Ocean Energy-Tidal	7-3	Homework: Before lecture read the assigned parts of the latest Ocean Energy annual report. Chapters (or Sections) 4, 5(country reports for Portugal, UK, Ireland, Canada, USA, Australia), 6 Video: <i>Energy From the Ocean</i>	HW 9
27	Nov. 9	M	26	Ocean Energy-Other	7-4	Tidal Energy Pty Video: Tidal Project Signals New Shift in Clean Energy: Water Power	
28	Nov. 11	W	27	Nuclear Energy Basics	8-1 to 8-3	The Eye of Nye-Nuclear Energy	
29	Nov. 13	F	28	Nuclear Power Evolution	8-4 to 8-5	The FLEX Solution: America's Nuclear Industry Responds to Fukushima	HW 10
30	Nov. 16	M		<b>Midterm Exam 2</b> <b>Sessions 10-26</b>			
31	Nov. 18	W	29	Nuclear Energy Future	8-5 to 8-6	Bill Gates Sees Future in Nuclear Energy Does the world need nuclear energy? A Ted debate	
32	Nov. 20	F	30	Hydrogen Economy	9-6	<i>Bloom Box;</i> <i>Ceramic Fuel Cells BlueGen SOFC;</i> <i>FUEL CELLS Clean Energy for the Future</i>	

33	Nov. 23	M	31	Electrical Infrastructure	9-1 to 9-4	<i>BrokenFoundation-US power grid nation's biggest danger How Power Gets to your Home The Smart Grid - The Big Picture Smart Grid Application</i>	HW 11
	Nov. 25	W		No Class - Thanksgiving			
	Nov. 27	F		No Class - Thanksgiving			
34	Nov. 30	M	32	Energy Storage 1	9	<i>RWE Power: ADELE - Adiabatic compressed air energy storage for electricity. How Battery Energy Storage Systems Can Improve Overall Performance of the Grid</i>	
35	Dec. 2	W	33	Energy Storage 2	9	<i>Areva Solar - Molten Salt Energy Storage; Energy Storage, the Holy Grail of Renewable Energy. Canada's First Utility-Scale Energy Storage System Supports Islands Remote Town During Outages.</i>	
35	Dec. 4	F	34	The Future	9		
36	Dec. 7	M					HW 12
	Dec. 10-11	Thur Fri		<b>Final Exam Sessions 1-34</b>			



