

Panipat Institute of Engineering & Technology

Department of Civil Engineering

For Lecture's in **B. Tech. Civil Engineering 7th Semester**

Course No.	Title of the Course	Course Structure	
ES-212A	Energy Science & Engineering	L-T-P	3-0-0
COURSE OUTCOMES (CO)			
CO1	To provide an introduction to energy systems and renewable energy resources		
CO2	It will explore fossil fuels and nuclear energy, and then focus on alternatives, renewable energy sources such as solar, biomass (conversions), wind power, waves and tidal, geothermal, ocean thermal, hydro and nuclear		
CO3	It will explore society's present needs and future energy demands, examine conventional energy sources.		
CO4	Energy conservation methods will be emphasized from Civil Engineering perspective		
UNIT NO`	Topics To Be Covered	Lecture Nos	
I	Introduction to Energy Science: Introduction to Energy,	01	
	sustainability & the environment, Energy systems and resources	02	
	Scientific principles and historical interpretation of energy use in critical societal	03-04	
	environmental and climate issues.	05	
II	Energy Sources: Fossil fuels	06-08	
	Coal, oil, oilbearing shale and sands, coal gasification	09	
	past, present & future, Remedies & alternatives for fossil fuels	10	
	biomass, wind, solar, nuclear, wave, tidal and hydrogen	11-12	
	Sustainability and environmental tradeoffs of different energy systems	13	
III	possibilities for energy storage or regeneration.	14-15	
	Energy & Environment	16	
	Energy efficiency and conservation	17	
	introduction to clean energy technologies and its importance in sustainable development	18	
	Carbon footprint, energy consumption and sustainability	19	
IV	Economics of energy.	20	
	Civil Engineering Projects connected with the Energy Sources: Coal mining technologies	21-22	
	Oil exploration off shore platforms, Underground and undersea oil pipelines, solar chimney project, wave energy caissons	23-25	
	Coastal installations for tidal power, wind mill towers	26	
	Hydro power stations aboveground and underground along with associated dams	27-28	
Tunnels, penstocks, etc	29-32		

Sr. No.	Course Coordination	Name	Contact No	E-Mail Id
1.	Course Coordinator	Mr. Ajeet Rathee	8708171615	ajeet.civil@piet.co.in