

Course code: 464VAC2	Course – II – FUEL GEOLOGY	Credits: -	Hours: 10
Objectives	<ul style="list-style-type: none"> ➤ To learn the various components of fuels. ➤ To learn the petroleum geology, its importance and its advances ➤ To understand the oil prospecting methods 		
Unit: I	Coal Geology: Origin of coal: peat formation and its environments, biochemical petrification, geochemical coalification, causes of coalification, coal maturity and diagenesis – Post depositional changes of coal seams –Coal formation in geological space and time.		
Unit: II	Physical properties of coal – Chemical composition of coal – Chemical analysis of coal: proximate and ultimate analysis – Classification of coal: Indian classification and international classifications (I.S.O. classification) – Classification of coal in terms of rank, grade and type – Outline of underground coal gasification, coal as an oil prone rock, coal as a liquid fuel.		
Unit: III	Petroleum Geology: Petroleum: constituents and composition – Origin of petroleum: organic and inorganic, evidences in their favour and against – Formation and migration of petroleum– Reservoir traps: structural, stratigraphic and combination traps – Oilfield fluids: water, oil and gas- Petroliferous basins of India – Geology of productive oilfields of India.		
Unit: IV	Prospecting methods for oil and gas: geological, geophysical (seismic) and geochemical methods – Micropaleontology in petroleum exploration – Oil and gas reserve estimation – Proved, probable and possible reserves – Deterministic methods – Drilling and logging procedures– Petroleum management and economics – Oil shale – Gas hydrates - Oil policy of India.		
Unit: V	Atomic Energy: Concept of atomic energy – Methods of exploration for atomic minerals – Productive geological horizons of atomic minerals in India – Geothermal energy: Principles of utilization of Earth’s heat – Types of geothermal source – Applications of geothermal sources – Exploration of geothermal sources.		
Reference and Textbooks: <ol style="list-style-type: none"> 1. Aswathanarayana, U (1985). Principles of Nuclear Geology, Oxford Press. 2. Chandra, D., Singh, R.M and M. P. Singh (2000). Textbook of Coal (Indian Context), Tara Book Agency, Varanasi. 3. Chandrasekharam, D (2005). Geothermal Energy Resources of India: Past and the Present, World Geothermal Congress - 2005, pp.1-9. 4. Dhana Raju, R (2005). Radioactive Minerals, Economic Geology series, Geological Society of India, 65p. 5. Boyle, R.W (1982). Geochemical Prospecting for Thorium and Uranium Deposits, Elsevier. 6. Brown, J. C and A. K. Dey (1975). Mineral and Nuclear Fuels of the Indian Subcontinent and Burma, A guide to the Study of the Coal, Oil, Natural Gas, Uranium, and Thorium Resources of the area. India, 533p. 7. Cataldi, R and M. C. S. Arriaga (2020). History of Geothermal Energy in the World to the 20th Century, ThinkGeoEnergy, Iceland. 8. Dahlkamp, F.J (1993). Uranium Ore Deposits, Springer Verlag. 			
Outcomes	<ul style="list-style-type: none"> ➤ To understand the physical and structural components of fuels. ➤ Realized the petroleum geology and its importance ➤ To gain the recent advances of oil exploration methods. 		