CEPC2001 FUEL & ENERGY TECHNOLOGY (3-0-0)

Module I: **(08hrs)**

Fuels: Solid Fuels: Coal - Origin, chemical composition, calorific value, classifications,Characteristics& distribution of Indian coals, storage and spontaneous combustion ofcoal,

Module II: **(07hrs)**

Coal washing and blending, petrographic constituents of coal, carbonization ofcoal,manufacture and properties of metallurgical coke, recovery of by-products.

Module III: **(12hrs)**

Liquid Fuels: Origin and composition of crude oil, crude oil distillation and its productswith special reference to gasoline, kerosene and diesel oil, cracking and reforming, coaltardistillation products,Shale oil.
Gaseous Fuels: Natural gas, coal gas,coke oven and blast furnace gas, manufacture of water-gas and producer gas, carburetted water gas.

Module IV: **(10hrs)**

Synthetic Fuels: Hydrogenation of coal, Fischer–Tropsch synthesis.
Nuclear Fuels: Introduction, nuclear fuels and nuclear reactors, moderators and structural materials.Introduction to renewable energy sources.

Module V: **(08hrs)**

Combustion: Combustion of solids fuels, calculation of volumes and weights of airnecessary for combustion of fuels, gas analysis.

Text Books:

1. Elements of Fuels, Furnaces & Refractories by O P Gupta, Khanna.

Reference Books:

1. Fuels and Combustion, 3rd ed. by S Sarkar, Universities Press.
2. The Elements of Fuel Technology, 2nd ed. by G W Himus, L Hill.
3. Fuel Solid, Liquid and Gaseous, 4th ed. by J S SBrame and J G King, Edward Arnold

Web learning resources:

1. Fuel and Combustion Technology by Prof. JayantaKumar Basu, Department ofChemical Engineering, IITKharagpur, Prof. SonaliSenguptaDepartment ofChemicalEngineering, IIT Kharagpur (Link: https://nptel.ac.in/courses/103/105/103105110/)