**LESSON PLAN (4th semester)**

 **FUELS AND CERAMIC KILNS**

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| SL.No |  TOPIC | Reference | Assignment | Comment/Periods |
| 1.0 | I INTRODUCTION TO FUEL AND COMBUSTION | O. P gupta  |  |  |
| 1.1 | state and explain introduction to solid liquid and gaseous fuels. | O. P gupta  |  | One period |
| 1.2 | Explain non conventional source of energy for burning ceramic kiln. | O. P gupta  |  | One period |
| 1.3 | State and explain combustion of fuels. | O. P gupta  |  | One period |
| 1.4 | Conservation of fuels. | O. P gupta  |  | One period |
| 1.5 | terms and definitions related to fuel testing. | O. P gupta  |  | One period |
| 2.0 | SOLID LIQUID AND GASEOUS FUELS |  |  |  |
| 2.1 | State various types of solid fuels. | O. P gupta  |  | One period |
| 2.2 | Classify solid fuels. | O. P gupta  |  |  One period |
| 2.3 | Describe methods of formation of coal and types of coal. | O. P gupta  |  | One period |
| 2.4 | State and explain the properties of coal. | O. P gupta  |  | One period |
| 2.5 | Describe in detail how Coke is prepared in Coke oven. | O. P gupta  |  | One period |
| 2.6 | State the properties of coke. | O. P gupta  |  | One period |
| 2.7 | Describe the procedure for storage of coal. | O. P gupta  |  | One period |
| 2.8 | State the reasons for washing of coal. | O. P gupta  |  | One period |
| 2.9 | Describe briefly the gradation of coal. | O. P gupta  |  | One period |
| 2.10 | Testing of solid fuel. | O. P gupta  |  | Two periods |
| 2.11 | Classify liquid fuels. | O. P gupta  |  | One period |
| 2.12 | describe the process of refining crude petroleum. | O. P gupta  |  | One period |
| 2.13 | state and explain the properties of various liquid fuels and petroleum by products( introduction only). | O. P gupta  |  | One period |
| 2.14 | State the advantages of liquid fuels over solid fuels. | O. P gupta  |  | One period |
| 2.15 | testing of liquid fuels such as flash point ,fire point ,pour point ,smoke point, dew point etc. (General ideas only). | O. P gupta  |  | One period |
| 2.16 | Describe the procedure for storage of liquid fuels. | O. P gupta  |  | One period |
| 2.17 | Classify gaseous fuel | O. P gupta  |  | One period |
| 2.18 | state and explain the properties of various gaseous fuels and their application in industries and blast furnace gas, Coke oven gas,BOF gas, coal gas, oil gas mixed gas. | O. P gupta  |  | Two periods |
| 2.19 | Explain in details the manufacturing method of procedure gas and water gas. | O. P gupta  |  | One period |
| 2.20 | List the advantages of gaseous fuel over liquid and solid fuel. | O. P gupta  |  | One period |
| 2.21 | Describe the manufacturing methods of biogas. | O. P gupta  |  | One period |
| 2.22 | Testing gaseous fuel (introduction only) | O. P gupta  |  | One period |
| 2.23 | Rocket fuel and Nuclear fuel. | O. P gupta  |  | One period |
| 3.0 | CERAMIC KILNS |  |  |  |
| 3.1 | Define kiln, furnace and oven. | O. P gupta  |  | Two periods |
| 3.2 | Classify ceramic kiln in details. | O. P gupta  |  | Two periods |
| 3.3 | describe the operation and uses of the following kilns in details:-a) downdraft kilnb) updraft kilnc) chamber kilnd) tunnel kiln and roller Hearth kilne) muffle kilnf)shaft kilng) glass pot furnaceh) glass tank furnacei) electric furnace for glass meltingj) rotary kilnk) Coke oven | O. P gupta  |  | One periodOne periodOne period one periodOne periodOne periodOne periodOne periodOne periodOne periodOne period |
| 3.4 | List the advantages of continuous kiln over period kiln. |  |  | One period |
| 3.5 | Describe various type of kiln furniture used in ceramic kilns. |  |  | One period |
| 3.6 | Describe various types of furnace and kilns accessories used in kiln operation. |  |  | One period |
| 4.0 | FURNACES (introduction only) | O. P gupta  |  |  |
| 4.1 | Classification of furnaces. | O. P gupta  |  | One period |
| 4.2 | Furnaces used in iron and steel plant. | O. P gupta  |  | One period |
| 4.3 | Fuels used in steel plant furnaces and their characteristics. | O. P gupta  |  | One period |
| 4.4 | Sketch the following furnaces showing various section and explain their uses. | O. P gupta  |  | One period |
| 5.0 | PYROSCOPE AND PYROMETER |  |  |  |
| 5.1 | Define pyroscope and pyrometer. | O. P gupta  |  | One period |
| 5.2 | Disuses various type of pyroscopes. | O. P gupta  |  | One period |
| 5.3 | Describe various types of cones used in ceramic kiln firing. | O. P gupta  |  | One period |
| 5.4 | state the requirements of Pyroscope and pyrometer in kiln firing. |  |  | One period |
| 5.5 | Describe various pyrometers used in ceramic kiln firing. |  |  | One period  |