**LESSON PLAN (3rd Semester)**

**RAW MATERIALS FOR CERAMIC MAKING**

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| **Sl. No** |  **TOPIC**  | **Reference** | **Assignment** | **Comment/Periods** |
| 1.0 | INTRODUCTION TO ROCK AND MINERALS. |   |  |  |
| 1.1 | Various type of Rock and their use as a ceramic raw material. | R.T | Yes  | Two periods |
| 1.2 | Various types of minerals and their mode of formation by weathering. | R.T | Yes  | Two periods |
| 1.3 | Properties of minerals. | R.T | Yes  | Two periods |
| 1.4 | Economic minerals and their importance. | R.T | Yes  | Two periods |
| 2.0 | CLAY FOR CERAMIC USE. |  |  |  |
| 2.1 | Definition , classification of clay. | R.T | Yes | One period |
| 2.2 | Various types of clay for ceramic use. | R.T | Yes | Two periods |
| 2.3 | Formation of clay. | R.T | Yes | One periods |
| 2.4 | Properties of clay. | R.T | Yes | Three periods |
| 2.5 | Clay minerals. | R.T |  | One period  |
| 2.6 | Effect of heat on clay. | R.T | Yes | One period |
| 3.0 | MAJOR AND MINOR CERAMIC RAW MATERIALS. |  |  |  |
| 3.1 | Major ceramic raw materials. | R.T | Yes | One period |
| 3.2 | List of minor ceramic raw materials. | R.T | Yes | One period |
| 3.3 | Silica bearing minerals and their properties and uses. (quartz, quartzite, Ganister, glass sand) | R.T | Yes | Two periods |
| 3.4 | Alumina bearing minerals Dev properties and uses. 1.Bauxite and other hydrated Alumina naturally available.2. Various type of prepared Alumina. | R.T | Yes | Three periods |
| 3.5 | Anhydrated Alumina silicate mineral and their properties and uses. | R.T | Yes | One period |
| 3.6 | lime and magnesia bearing minerals for ceramic uses. (Limestone, dolomite, magnetite, calcite, gypsum, talc, forsterite & Olivine) | R.T | Yes | Three periods |
| 3.7 | Alkali bearing minerals their properties and uses. ( Potash feldspar and soda feldspar) | R.T | Yes | Two periods |
| 3.8 | Fluorine bearing minerals (cryolite , fluorite) | R.T | Yes | One period |
| 3.9 | Boron minerals for ceramic use borax and boron compounds. | R.T | Yes | One period |
| 3.10 | Graphite and carbon, Zircon & Zirconia.  | R.T | Yes | Two periods |
| 3.11 | Raw materials use for ceramic making. | R.T | Yes | Two periods |
| 3.12 | Raw materials for glass and enamel industry. | R.T | Yes | One period |
| 3.13 | raw material for white ware and special ceramic. | R.T | Yes | Two periods |
| 4.0 | AVAILABILITY OF CERAMIC RAW MATERIALS. |  |  |  |
| 4.1 | Availability of ceramic raw materials in India. | R.T | Yes | Two periods |
| 4.2 | Availability various ceramic raw materials in Odisha. | R.T | Yes | Two periods |
| 4.3 | Ceramic raw material imported from other countries. | R.T | Yes | One period |
| 5.0 | BENIFICIATION AND UTILISATION OF WASTE MATERIAL AS A CERAMIC RAW MATERIAL. |  |  |  |
| 5.1 | Beneficiation of China clay. | R.T | Yes | One period  |
| 5.2 | Beneficiation non plastic ceramic raw material. | R.T | Yes | One period |
| 5.3 | Use of fly ash and blast furnace slag.  | R.T | Yes | One period  |
| 5.4 | Use of redmud, phosphogypsum and rice husk in ceramic making. | R.T | Yes | Two periods |
| 6.0 | BINDERS, ADDITIVES, AND CHEMICALS USED IN CERAMIC MAKING. | R.T |  |  |
| 6.1 | Various type of binder used in ceramic making. | R.T | Yes | One period  |
| 6.2 | Various types of additives used in refractory making. | R.T | Yes | One period |
| 6.3 | Chemical compounds used in ceramic making. | R.T | Yes | One period  |