

OBJECTIVES:

To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such as soil, lime, rocks and stones.

To inform the properties, characteristics and use of bamboo, palm, straw, etc. and methods of preservation and treatment.

To sensitize the students to the use of these naturally occurring materials in the context of creating a green architecture.

UNIT I SOILS 9

Fundamentals of Soil Science, Types of soils, Principles of Soil Stabilization, Characteristics of core, Types of Stabilizers, Requirements and Types of mudwall building and surface protection.

UNIT II LIME 8

Types of lime, Classification of lime, comparison between fat lime and hydraulic lime, Manufacturing process slaking, Hardening – Testing and Storage, Lime putty, Precautions in handling and uses of lime.

UNIT III BAMBOO AND OTHER MATERIALS 10

Bamboo – Bamboo as plant classification, species, geographical distribution, Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo.

Cane, gate, coir, coconut - Growth, Form, Shape, Leaves, Flowering, Propagation Roofing materials – Thatch, grass, Bamboo, reeds – Basics – Case studies and applications.

UNIT IV STRAW BALES 6

Straw as a building material-physical aspects - Basics, Fire, moisture, insects and pests proof. Plastering straw bale walls, straw bale roof.

UNIT V ROCKS AND STONES 12

Classification of rocks, Sources, Seasoning, Quarrying of stones, Dressing, Characteristics of stones, Testing of stones, Common building stones and their uses. Masonary and paving. Stone veneering, preservation of stones Deterioration of stones, Durability, Preservation, Selection of stones, Artificial stones.

REQUIRED READINGS:

Varghese P.C., "Building Materials", Prentice Hall of India put Ltd New Delhi, 2005.

Dunkelberg (K), "Bambus – Bamboo, Bambo as a Building Material", Karl Kramer Verlag Stuttgart, 2000.

Gernot Minke and Friedemann Mahlke "Building with straw: Design and Technology of a Sustainable Architecture", Birkhauser, Publisher for Architecture Berlin, Bostan, 2005.

REFERENCES:

Duggal S.K., "Building materials", Oxford and IBH publishing Co, put, Ltd, New Delhi, 1997.

Spence R. F. and Cook D.J., "Building Materials in Developing Countries", John Wiley and sons 1983.