

OBJECTIVES:

To study ferrous and non ferrous materials in construction.

To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials such steel and steel alloys, aluminum and aluminum alloys.

To inform the innovations in the steel industry and the standards and accepted industrial practices involved.

To inform the properties, characteristics and application of plastics in the construction industry as well as other light weight roofing materials.

UNIT I FERROUS METALS: STEEL 9

Iron ore: definition, introduction, manufacture of iron ore, types- pig iron, wrought iron and cast iron-their properties and uses.

Steel - definition, properties, Manufacture, casting, heat treatment, mechanical treatment process of steel, market forms of steel, fire protection of steel - Corrosion of ferrous metals (Causes, factors of corrosion and prevention).

UNIT II STEEL ALLOYS AND INNOVATIONS IN STEEL INDUSTRIES 9

Steel alloys- properties and uses. Structural steel-definition and protection. Steel sheeting- types of sheeting. Stainless steel in building Industry as a structural entity by studying codes. Study of innovations in steel industry. Design and construction parameters developed by INSDAG.

UNIT III NON-FERROUS METALS 9

Aluminium and Aluminums Alloys (Manufacture, properties, durability, and uses) - Aluminium products (extrusions, foils, castings, sheets etc.) - Other non-ferrous metals copper, lead, zinc (Manufacture, grades, forms, sizes) - Study of protection to non-ferrous metals and products such as anodizing, powder coating, painting, stove enamelling, chromium plating, varnishing, melamine treatments.

UNIT IV PLASTICS 9

Polymerisation, thermoplastics, thermosetting plastics, elastomers, properties of plastics, strength, plastic forming process, uses of plastics and decorative laminates - Plastics in construction (polythene, poly propylene, PVC, ethylene, polycarbonate, acrylic flooring, PVC tiles)

UNIT V OTHER MATERIALS 9

Light-roofing materials (Recent trends in roofing materials like Corrugated GI Sheets, Pre-coated metal sheets, Polycarbonate sheeting, Teflon coated sheets, PTFE Steel alloys properties and uses) - Adhesives, Sealants and joint fillers (Relative movement within buildings, types of sealants- elasto-plastic, elastic sealants- joint design- fire resistant sealants- gaskets- adhesives, epoxy, wall paper, bitumen, plastic pipe) - Materials for flooring finishes such as epoxy, oxy-chloride, hardeners, PVC, carpets.

**TOTAL: 45
PERIODS**

OUTCOMES:

An Understanding of ferrous and Non-ferrous metals in terms of its properties, manufacture and their applications in architectural construction.

The students are made to be aware of plastics and its applications in building industry as well as light roofing materials adhesives, Sealants and fillers apart from flooring finishes.

REQUIRED READING:

S.C.Rangwala, "Engineering Materials", Charotar Publishing House, India, 1997.

S.K Duggal, "Building Materials", Oxford and IBM Publishing Co, Pvt. Ltd., 1997.
P.C Varghese, "Building Materials", Prentice Hall of India Pvt. Ltd., New Delhi, 2005

REFERENCES:

1. Don A.Watson, "Construction Materials and Process", McGraw Hill Co., 1972.
2. Arthur Lyons, "Materials for Architects and Builders", An introduction Arnold, London, 1997.
3. Gorenc, Tinyou, Syam, "Steel Desinger's Handbook", CBS Publishers and Distributors, New Delhi, Bangalore, 2005
Ralph Monletta, "Plastics in Architecture" – A guide to acrylic and Polycarbonate, Marcel Dekker Inc, New York, 1989
Jack M Landers, "Construction Materials, Methods, Careers", Good Heart - WilCox Company, Inc Publishers, Homewood, IL, 1983

