BUILDING MATERIAL II

ENAR 203

Lecture : 3 **Year : II**
Tutorial : 1 **Part : I**
Practical : 0

Course Objectives:
The objective of this course is to provide knowledge of different building materials, develop understanding of properties, quality and uses of materials and their testing methods to determine their qualities. This course introduces students to various building materials used in the building construction industry.

1 Introduction (1 hours)

1.1 Building materials and their types
1.2 Importance of building materials in architecture and engineering field

2 Timber (9 hours)

2.1 Timber and wood as building materials
2.2 Classification of trees (Exogenous and endogenous trees) and species available in Nepal
2.3 Structure of exogenous tree
2.4 Conversion of timber
2.5 Seasoning of timber (Natural and Artificial seasoning)
2.6 Decay and preservation of timber
2.7 Defects in timber
2.8 Commercial timber products (veneers, plywood, laminates)

3 Metals (9 hours)

3.1 Metals, uses, properties and extraction of iron
3.2 Rolled structural steel (Hot rolled and cold rolled)
3.3 Ferrous metals (Pig iron, cast iron, wrought iron, mild steel, TOR steel, TMT, stainless steel)
3.4 Non-ferrous metals (Aluminum, copper, zinc, tin, lead, brass, bronze)
3.5 Commercial steel products (Standard section of MS used for construction purpose (Market forms of MS)

4 Paints and Varnish (9 hours)

4.1 Use, constituent and characteristics of paints and varnishes
4.2 Process of painting
4.3 Process of painting on different old and new surfaces (Wood work, metallic surfaces, plastered surfaces, concrete surfaces, floor surfaces, damp walls)
4.4 Defects in painting
4.5 Impacts of paints (Health and well-being)

5 Insulators (3 hours)

5.1 Thermal insulator
5.2 Sound insulator

6 Plasters (3 hours)

6.1 Cement plaster
6.2 Lime plaster
6.3 Mud plaster

7 Wall and Floor Finishing (5 hours)

7.1 Importance and role of finishing
7.2 Types of wall finishes, its properties and uses (Cement plastered and textured finish, plaster of Paris, cement putting, pebbles finish, tile cladding, wood paneling, wallpaper, ACP)
7.3 Types of floor finishes, its properties and uses (Tile, marble, granite, wood, brick, stone, PVC)

8 Miscellaneous Materials (3 hours)

8.1 Ferro cement
8.2 Fire protective materials and techniques

9 Current Trend and Creativeness in Materials (3 hours)

9.1 Sustainable and eco-friendly materials (Biodegradable, recycled)
9.2 Carbon negative materials
9.3 Energy efficient materials

Tutorial (15 hours)

1. Market survey discussion
2. Preparation of questionnaire (Types, properties, cost, application)

Assignment

Market survey and sample collection of different types of materials, its use, price and standard sizes.

Final Exam

The questions will cover all the chapters in the syllabus. The evaluation scheme will be as indicated in the table below:

Chapters	Hours	Marks distribution*
1&2	10	12
3	9	12
4	9	12
5,6,7	11	14
8,9	6	10
Total	**45**	**60**

* There may be minor deviation in marks distribution.

References

1. Singh, G. (2006). Building Materials. Delhi: Standard Publishers Distributors.
2. Kumar, S. (2006). Building Construction. Delhi: Standard Publishers Distributors.
3. Frampton, K., Cava, J. (2001). Studies in tectonic culture: the poetics of construction in nineteenth and twentieth century architecture. MIT Press.
4. Hegger, M., Drexler, H., Zeumer, M. (2006). Basics Materials. Basel: Birkhäuser.
5. Deplazes, A., (2005). Constructing Architecture: Materials, Processes, Structures. Basel: Birkhäuser.
6. Schröpfer, T. (2010). Material Design: Informing Architecture. Basel: Birkhäuser Architecture.
7. Dirk, E., Hebel, D.E., Wisniewska, M.H., Heisel, F. (2014). Building from Waste: Recovered Materials in Architecture and Construction. Basel: Birkhäuser.