

Course Name:

Construction Materials and Concrete Technology

Course Number:

20208

Credit:

3

Prerequisite:

Solid Mechanics

Course Description (Objectives):

In this Course, various materials commonly used in constructing structures are introduced. Properties of materials, such as chemical, strength and durability are explained and application of each material in various structures is demonstrated. Special attention is given to concrete as is used more than other materials in construction. The concrete ingredients including fine and coarse aggregates, cement, water and additives and role of each in concrete mix are defined. Knowledge of concrete making and curing, influencing short and long-term behavior is attained. Experiments will be conducted to familiarize students with ASTM standards for evaluating aggregates and cement behavior and also concrete strength under compression and tension.

Course Content (outline):

- Bricks (Classical and Modern)
- Ceramic and Tile
- Building blocks
- Stones
- Gypsum
- Lime
- Bituminous Materials

- Concrete Technology
 - Fundamentals
 - Portland Cements
 - Concrete Mix Water
 - Aggregates
 - Air-entrained Concrete
 - Additives for Concrete
 - Concrete Mix Design
 - Concrete Making and Transportation
 - Casting and Finishing
 - Concrete Curing
 - Hot and Cold Weather Concreting
 - Quality Control of Concrete
 - Special Concretes

References:

- Construction Materials Notes, Dr. Khaloo.
- Design and Control of Concrete Mixtures, Khaloo and Irajian.
- Guidelines for Experiment on Construction Materials and Concrete Technology, Dr. Khaloo.