



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**  
**An Autonomous Institution**



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## **DEPARTMENT OF CIVIL ENGINEERING**

### **16CEE304 – CONCRETE TECHNOLOGY**

III YEAR VI SEM

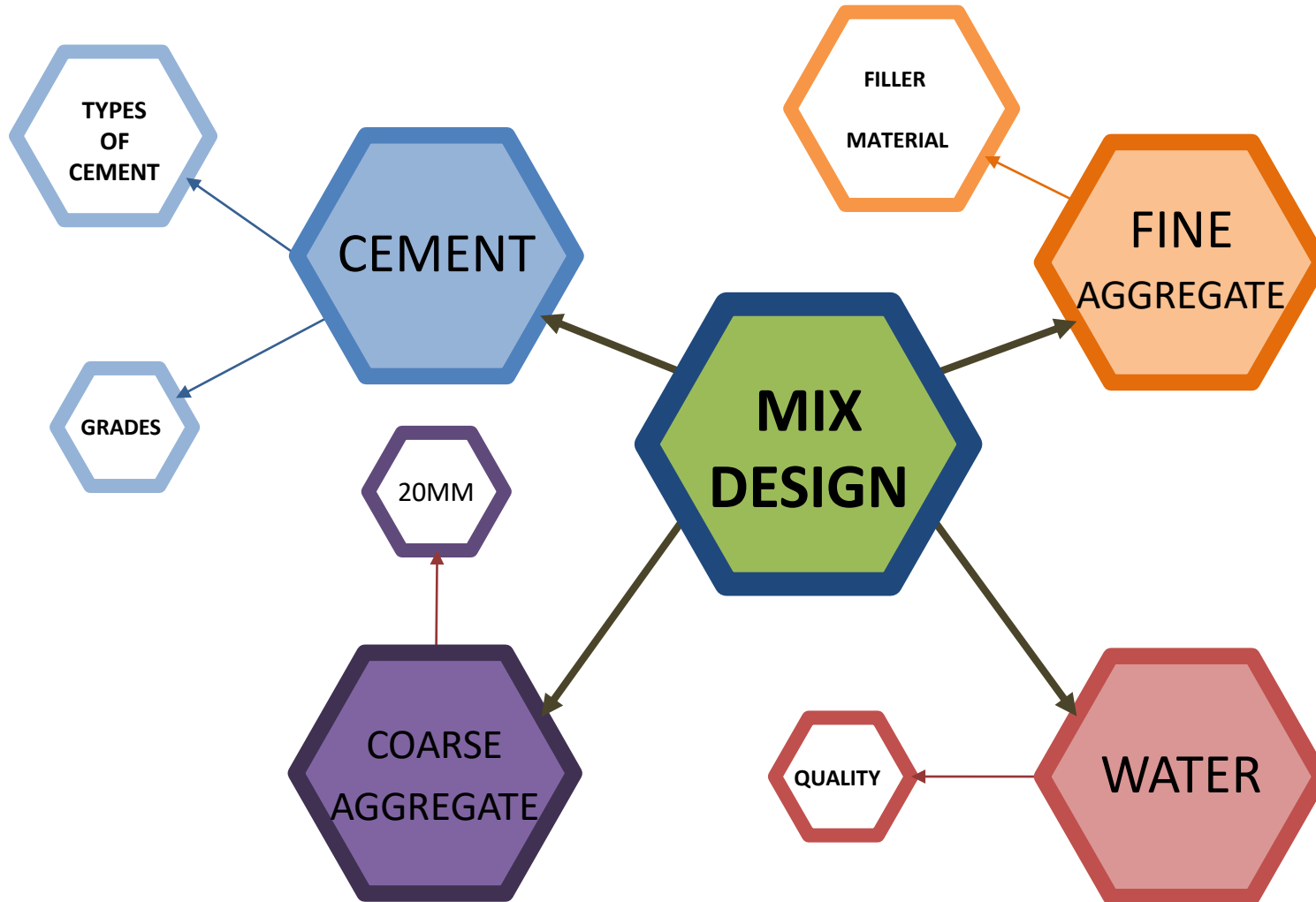
#### **UNIT 2 – MIX DESIGN**

##### **TOPIC 1 – INTRODUCTION TO MIX DESIGN**

Mix design : Introduction, concept of mix design – various mix design methods – batching of ingredients: volume batching, weigh batching – IS method and ACI method of mix proportioning-  
Mix Proportioning of concrete uses admixtures.

# **MIX DESIGN**

# Mind Map – Mix Design



# Concrete

Mixture of

Cement,

Fine Aggregate,

Coarse Aggregate

Water.



# Grade of Concrete

Group	Grade designation	Characteristics compressive strength of 150 mm cube at 28 days, N/mm <sup>2</sup>
Ordinary Concrete	M10	10
	M15	15
	M20	20
Standard Concrete	M25	25
	M30	30
	M35	35
	M40	40
	M45	45
	M50	50
High Strength Concrete	M55	55
	M60	60
	M65	65
	M70	70
	M75	75
	M80	80

# Mix Design

The process of selecting suitable ingredients of concrete and determining their relative amounts with the objective of producing a concrete of the required, strength, durability, and workability as economically as possible, is termed the concrete mix design.

# What is M 20 ?

- M refers to Mix
- 20 refers to characteristic compressive strength of 150 mm cube at 28 days in  $\text{N/mm}^2$
- The minimum Grade of Plain Concrete (PCC) shall be 15  $\text{N/mm}^2$
- The minimum grade of reinforced Concrete (RCC) shall be 20  $\text{N/mm}^2$



# Characteristic Strength

- Defined as the value below which not more than 5 percent of results are expected to fall.

# Concrete Mix Design

- Art of selecting suitable ingredients of concrete and determining their relative proportions with the object of producing concrete of certain minimum strength & durability as economically as possible.



## Objectives :

- To achieve the designed/ desired workability in the plastic stage.
- To achieve the desired minimum strength in the hardened stage.
- To achieve the desired durability in the given environment conditions
- To produce concrete as economically as possible.

# Concept of Mix design

- Relationship b/w Aggregate & Paste, the 2 essential ingredients of concrete.
- Workability is,
  - provided by lubricating effect of paste,
  - influenced by amount & dilution of paste
- Strength of concrete is,
  - Limited by strength of paste,
  - Increased by mineral aggregates.

- Permeability – governed by quality & continuity of paste.



- Paste contributes predominantly in drying shrinkage of concretes.
- More dilute the paste, greater the spacing b/w cement particles & thus weaker will be the paste structure.
- Strength of concrete inversely proportional to W/C ratio.