

# GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Civil Engineering

Academic Year: **2017-18**

Semester: **EVEN**

## COURSE PLAN

Semester: **IV**

Subject Code& Name: **15CV44 & Concrete Technology**

Name of Subject Teacher: **ARCHANA GOUTHAMAN**

Name of Subject Expert (Reviewer): **SHREYAS H.C.**

For the Period: From: 06-02-17 to 02-06-17

### Details of Book to be referred:

Text Books	<b>TB 1: Properties of Concrete-</b> Neville, A.M. - ELBS Edition, Longman Ltd., London <b>TB 2: Concrete Technology-</b> M.S. Shetty <b>TB 3: Concrete Technology-</b> A.R. Santhakumar,-Oxford University Press <b>TB 4: ACI Code for Mix Design</b> <b>TB 5: IS 10262-2004.</b>
Reference Books	<b>RB 1: Concrete Mix Design-</b> N. Krishna Raju - Sehgal Publishers <b>RB 2: Advanced Concrete Technology Processes-</b> John Newman, Ban Seng Choo, - London.

Lecture No	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	<b>Module-1</b> Introduction	<b>Objective:</b> To know the	TB 1, 9 TB 2,15	20/02/2017				

2.	Cement - Manufacturing process	importance of Concrete, the process of Manufacturing of Cement, Hydration of Cement, Physical properties, types of cement along with chemical and mineral admixtures.  <b>Application:</b> For building various structures like bridges, roads, residential/commercial buildings.	TB 1, 25 TB 2, 22	20/02/2017				
3.	Cement – Chemical Composition and Hydration		TB 1, 26	20/02/2017				
4.	Cement - Characteristics of Hydration of the Cement Compounds		TB 1, 31	21/02/2017				
5.	Cement- Physical Properties and Testing of Cement		TB 2, 329	22/02/2017				
6.	Cement- Types of Cement ; Water– qualities of water		TB 2, 387	23/02/2017				
7.	Chemical Admixtures		TB 2, 124	27/02/2017				
8.	Chemical Admixtures - Air Entraining admixtures		TB 2, 126-129	28/02/2017				
9.	Mineral Admixture – Fly Ash		TB 1,255 and 257	1/03/2017				
10.	Mineral Admixtures - High Performance Concrete		TB 2,132	2/03/2017				
11.	Mineral Admixtures – Techniques of producing HPC		TB 3, 82	3/03/2017				
12.	Mineral Admixtures – GGBS, Metakaolin, Rice husk Ash		TB 4, 2	4/03/2017				
13.	Recycled Aggregates, Alternatives to River Sand		TB 2, 3	6/03/2017				
14.	<b>Module-2 - Fresh Concrete Workability-</b> factors affecting workability		<b>Objective:</b> To understand the fundamentals of workability.  <b>Application:</b>	TB 1, 2	7/03/2017			
15.	Measurement of workability– Slump, Flow Test	TB 4, 5		8/03/2017				
16.	Measurement of	TB 4, 5		13/03/2017				

	workability - Compaction factor Test	To prescribe the concrete with a said workability to various types of constructions.  <b>OUTCOME:</b> Measure workability, Improve the workability and adopt best practices in the construction of civil engineering structures.						
17.	Measurement of workability – Vee-Bee Consistometer test		TB 4, 5	14/03/2017				
18.	Segregation and bleeding		TB 4, 5	15/03/2017				
19.	Process of manufacturing of concrete- Batching, Mixing, Transporting, Placing and Compaction		TB 2, 349-351	16/03/2017				
20.	Process of manufacturing of concrete- Batching, Mixing, Transporting, Placing and Compaction		TB 2, 354 TB 2, 389	17/03/2017				
21.	Curing – Methods of curing – Water curing, membrane curing, steam curing, accelerated curing		TB 1, 505 and 506	20/03/2017				
22.	Curing – Methods of curing – Water curing, membrane curing, steam curing, accelerated curing		TB 1, 148	21/03/2017				
23.	Good and Bad practices of making and using fresh concrete		TB 1, 148	22/03/2017				
24.	Good and Bad practices of making and using fresh concrete		TB 2, 394	23/03/2017				
25.	Effect of heat of hydration during mass concreting at project sites to be discussed		TB 1, 214	24/03/2017				
26.	Effect of heat of hydration during mass concreting at project sites to be discussed	TB 2, 238-251	27/03/2017					
27.	<b>Module-3</b> - Hardened Concrete Factors influencing strength - W/C	TB 1, 217 and 219, 224	28/03/2017					

	ratio	<p><b>Objective:</b> To understand the hardened concrete properties by factors influencing strength, durability of concrete.</p> <p><b>Application:</b> Preparing the concrete mix taking care of the durability and factors affecting the same.</p>							
28.	Hardened Concrete Factors influencing strength - Gel/space ratio		TB 2, 180	30/03/2017					
29.	Maturity concept		TB 4 TB 3, 353						
30.	Testing of hardened concrete		TB 2, 572	31/03/2017					
31.	Creep –factors affecting creep		TB 2, 526	1/04/2017					
32.	Shrinkage of concrete – plastic shrinking and drying shrinkage		TB 2, 536	3/04/2017					
33.	Factors affecting shrinkage.		TB 2, 539	4/4/2017					
34.	Definition and significance of durability		TB 3, 472-475	5/4/2017					
35.	Internal and external factors influencing durability		TB 2, 568	6/4/2017					
36.	Mechanisms- Sulphate attack – chloride attack, carbonation, freezing and thawing		TB 2, 566	7/4/2017					
37.	Corrosion, Durability requirements as per IS-456		TB 2, 570	10/4/2017					
38.	In-situ testing of concrete- Penetration and pull out test, rebound hammer test, ultrasonic pulse velocity		TB 1, 148	11/4/2017					
39.	Core extraction – Principal, applications and limitations		TB 2, 394	12/4/2017					
40.	<b>Module-4</b> : Concrete Mix Proportioning Concept of Mix Design with admixtures	<b>Objective:</b> Designing of the	TB 2, 504	13/4/2017					

41.	Concrete Mix Proportioning Concept of Mix Design with admixtures	<p>concrete mix with and without admixtures.</p> <p><b>Application:</b> Using these designs we are able to proportion the mix by IS:456 for the required constructions.</p>	TB 2, 510	24/4/2017				
42.	Concrete Mix Proportioning Concept of Mix Design without admixtures		TB 2, 520					
43.	Concrete Mix Proportioning Concept of Mix Design - variables in proportioning and Exposure conditions		TB 2, 323 TB 3, 295	25/04/2017				
44.	Selection criteria of ingredients used for mix design		TB 2, 504	26/04/2017				
45.	Procedure of mix proportioning		TB 2, 510	27/04/2017				
46.	Numerical Examples of Mix Proportioning using IS-10262-2009.		TB 2, 520	28/04/2017				
47.	Numerical Examples of Mix Proportioning using IS-10262-2009.		TB 2, 521	2/5/2017				
48.	Numerical Examples of Mix Proportioning using IS-10262-2009.		TB 2, 522	3/5/2017				
49.	Numerical Examples of Mix Proportioning using IS-10262-2009.		TB 2, 523	4/5/2017				
50.	Numerical Examples of Mix Proportioning using IS-10262-2009.		TB 2, 524 TB 3, 295	5/5/2017				
51.	Numerical Examples of Mix Proportioning using IS-10262-2009.		TB 3, 296	6/5/2017				
52.	<b>Module 5:</b> Introduction to Special Concretes RMC		TB 1, 214	8/5/2017				

53.	Manufacture and requirement as per QCI-RMCPCS	<p><b>Objective:</b> To study ready mix concrete, self compacting concrete and light weight concrete.</p> <p><b>Application:</b> More durable and sustainable structures</p> <p><b>OUTCOME:</b> Reduction in the quantity of cement, less environmental pollution and more durable structure.</p>	TB 2, 238-251	9/5/2017				
54.	RMC Properties		TB 1, 217 and 219, 224	10/5/2017				
55.	RMC Advantages and disadvantages		TB 2, 180					
56.	Self-Compacting concrete-concept,		TB 4 TB 3, 353	11/5/2017				
57.	Self-Compacting concrete-materials,		TB 2, 572	12/5/2017				
58.	Self-Compacting concrete-tests		TB 2, 526	15/5/2017				
59.	Self-Compacting concrete-properties, application and typical mix		TB 2, 536	16/5/2017				
60.	Fiber reinforced concrete - Fibers types, properties		TB 2, 539	17/5/2017				
61.	Application of FRC		TB 3, 472-475	18/5/2017				
62.	Light weight concrete-material properties and types		TB 2, 568	20/5/2017				
63.	Typical light weight concrete mix	TB 2, 566	22/5/2017					
64.	Applications - light weight concrete mix	TB 2, 567	23/5/2017					

Prepared By: \_\_\_\_\_  
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(Sub. expert)  
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