Program : **Diploma in Civil Engineering**	
Course Code : **3015**	Course Title: **Concrete Technology Lab**
Semester : **3**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0, T:0, P:3)**	Periods per semester: **45**

Course Objectives:

- To impart knowledge to the students to identify the physical properties of cement, fine aggregate and coarse aggregate by performing laboratory tests.
- To enable students to prepare concrete of desired compressive strength and specifications by maintaining the quality of concrete
- To enable them to alter the properties of concrete according to the different conditions by learning the characteristics of admixtures

Course Prerequisites:

Topic	Course code	Course name	Semester
Properties of ingredients of concrete		Concrete technology	3
construction materials		Building construction and construction materials	3

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Determine different properties of cement	9	Applying
CO2	Determine the physical properties of fine aggregate	13	Applying
CO3	Determine the physical properties of coarse aggregate	9	Applying
CO4	Prepare concrete of desired compressive strength and specification	10	Applying
	Lab Test	4	

CO – PO Mapping:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1				3			
CO2				3			
CO3				3			
CO4			3				3

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline:

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Determine different properties of cement**		
M1.01	Determine fineness of cement (sieve test) and specific gravity	3	Applying
M1.02	Determine standard consistency, initial and final setting times of cement	3	Applying
M1.03	Determine soundness and compressive strength of cement.	3	Applying
CO2	**Determine the physical properties of fine aggregate**		
M2.01	Determine silt content in sand.	2	Applying
M2.02	Determine bulking of sand.	3	Applying
M2.03	Determine bulk density of fine aggregate	3	Applying
M2.04	Determine water absorption of fine aggregate	2	Applying
M2.05	Determine Fineness modulus of fine aggregate by sieve analysis	3	Applying
	Lab Test I	2	
CO3	**Determine the physical properties of coarse aggregate**		
M3.01	Determine bulk density of coarse aggregate	3	Applying
M3.02	Determine water absorption of coarse aggregate	3	Applying
M3.03	Determine Fineness modulus of coarse aggregate by sieve analysis	3	Applying

CO4	Prepare concrete of desired compressive strength and specification		
M4.01	Determine workability of concrete by slump cone test and compacting factor test	3	Applying
M4.02	Prepare concrete mix of a particular grade	3	Applying
M4.03	Determine compressive strength of concrete for 7 and 28 days.	2	Applying
M4.04	Demonstration of Non Destructive Testing (NDT) equipments.	2	Understanding
	Lab Test II	2	

Text /Reference:

T/R	Book Title/Author
T1	Concrete Technology, Gambhir, M.L, Tata McGraw Hill Publishing Co. Ltd., Delhi
R1	Concrete Technology, Shetty, M.S, S. Chand and Co. Pvt. Ltd., Ram Nagar, Delhi
R2	Concrete Technology, Santhakumar, A. R., Oxford University Press, New Delhi
R3	Laboratory Manual in Concrete Technology, Sood, H., Kulkarni P. D., Mittal L. N., CBS Publishers, New Delhi.
R4	Concrete Technology, Neville, A. M , Pearson Education Pvt. Ltd., New Delhi.

Online Resources:

Sl.No	Website Link
1	https://civiltoday.com/civil-engineering-materials/cement/111-properties-of-cement-physical-chemical-properties
2	https://civilread.com/14-different-types-cement-must-know/
3	https://theconstructor.org/concrete/workability-of-concrete-types-strength/11739/
4	https://theconstructor.org/concrete/types-concrete-admixtures/5558/
5	https://civiconcepts.com/wp-content/uploads/2019/01/IS-10262-2.pdf