

Branch Name:	Civil engineering
Program Code:	ET401
Course Name:	Concrete Technology
Course Code:	2ET4010502
Pre-requisite Course:	---

COURSE OBJECTIVE:

The content should be taught and implemented with the aim to develop skills so that students are able to acquire following competencies:

1. Evaluate physical properties of cement, sand and aggregates.
2. Describe proper method for making and curing of concrete.
3. Measure important properties of fresh and hardened cement concrete including NDT.
4. Design Concrete Mix as per IS method.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment
03	-	02	04	60	40	20	30

DETAILS OF COURSE CONTENTS:

S.NO.	TOPIC	Total Hrs.	WEIGHTAGE
1	Materials for Concrete 1.1. Importance of cement in preparation of concrete Chemical compound of ordinary Portland cement, Bougue's compounds and its functions. 1.2. Types and Grades of cement. 1.3. Physical properties- Fineness, consistency of Cement, IST & FST, Soundness & Compressive Strength of cement and its I.S. Requirements, Its Importance & their related Test as per Indian Standards. 1.4. Role of Coarse & Fine Aggregates in Concrete & their related Test as per Indian Standards. 1.5. Admixtures and its benefits 1.6. Over view of different IS code of concrete making material	10	24%

2	Fresh Concrete 2.1. Fresh concrete and it's properties Workability, harshness, Segregation and bleeding. 2.2. Factors affecting workability. 2.3. Methods of measurement of workability like Slump Test & Compaction Factor Test, flow table test. 2.4. Relation between workability and strength of concrete. 2.5. Methods of mixing of concrete in Technical terms. 2.6. Methods of compaction of concrete and its suitability. . 2.7. Factors affecting compaction. 2.8. Curing and its importance, its methods and suitability.	10	24%
3	Hardened Concrete 3.1. Hardened Concrete and its Properties. 3.2. Factors affecting Compressive Strength. 3.3. Creep of Concrete & its effect, factors affecting Creep. 3.4. IS Test Procedure to find Compressive & Tensile Strength of Concrete, Acceptance Criteria, Mean Strength & Standard Deviation. 3.5. Durability of Concrete & factors affecting it. 3.6. Economy of Concrete & factors affecting it 3.7. Methods of Non Destructive Test of Concrete.	10	20%
4	Concrete Mix Design 4.1. Factors affecting quality of concrete, Advantages of quality control. 4.2. Concrete Mix Design and its importance. 4.3. Nominal Mix and Design Mix. 4.4. Factors affecting concrete mix design. 4.5. Different methods of Mix Design and its suitability. 4.6. I.S. method to design a Concrete Mix As per IS 10262-2009 4.7. Example of Mix design as per I.S. method.	08	18%
5	Special Concrete & Concreting Techniques 5.1. Light weight Concrete. 5.2. Plum concrete. 5.3. Fiber reinforced concrete. 5.4. Polymer concrete. 5.5. High density concrete. 5.6. Vacuum Processed Concrete 5.7. Ready mix concrete. 5.8. Pumped Concrete. 5.9. Recycled aggregate concrete and status in India.	04	14%

LIST OF PRACTICAL:

Sr. No.	Experiment / Exercises
1	Determine standard consistency, initial and final setting times of cement.
2	Determine compressive strength of cement.
3	Determine workability of concrete by slump cone test.
4	Determine workability of concrete by compaction factor test.
5	Determine workability of concrete by flow table test.
6	To prepare concrete mix of a particular grade and determine compressive strength of concrete for 7 and 28 days.
7	Demonstration of NDT equipment.

LIST OF REFERENCES:

Sr.no.	Title	Author
1	Concrete Technology	M.S. Shetty
2	Concrete Technology	Dr. K.T. Krishna swami
3	Concrete Technology	R.S. Vashney
4	Concrete Technology	Dr. R.P.Rethaliya

LIST OF OPEN SOURCE SOFTWARE/LEARNING WEBSITE:

- 1) www.academia.edu
- 2) www.nptel.iitm.ac.in
- 3) "https://en.wikipedia.org/w/index.php?title=Dumbwaiter_(elevator)&oldid=621761813"
- 4) www.bis.org.in/sf/nbc.htm
- 5) cpwd.gov.in/Units/handbook.pdf
- 6) <https://www.civilengineeringnews.tk/2014/07/methods-of-demolition-of-building.html>
thecontractor.org

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Identify the functional role of ingredients of concrete and apply this knowledge to mix design	1 Remembering
CLO2	Ability to perform various tests on concrete ingredients and also on concrete	2 Understanding, 3 Applying
CLO3	Basic knowledge of Nondestructive testing.	2 Understanding
CLO4	Ability to analyze various special concrete and their applications.	3 Applying, 2 Understanding
CLO5	Understand the factors influencing concrete mix & know the BIS method of mix design.	3 Applying 4 Analyze 5 Evaluate

Course Learning Outcomes	Program Outcomes(Pos)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	L											
CLO2	M	M										
CLO3	H		M				H					
CLO4	H	H			I	L				I	L	
CLO5	L		L				H					

H: High, M: Medium, L: Low