

Mohamed Sathak A.J college of Engineering, Chennai.

DEPARTMENT OF Civil Engineering

LESSON PLAN

Course/Branch	:	B.E Civil Engineering	Total no. of hours given in syllabus:		
Subject Code	:	CE8404	Lecture	:	45
Subject Title	:	CONCRETE TECHNOLOGY	Tutorials	:	0
Year/Semester	:	III/VI	Practical	:	0
Faculty Name	:	S.Hemavathi	TOTAL	:	45
Regulation	:	2017	Credits	:	03

COURSE OBJECTIVES :

The student should be made to:

To impart knowledge to the students on the properties of materials for concrete by suitable tests, mix design for concrete and special concretes.

COURSE OUTCOMES:

Upon completion of the course, the student should be able to:

- ☐ The various requirements of cement, aggregates and water for making concrete
- ☐ The effect of admixtures on properties of concrete
- ☐ The concept and procedure of mix design as per IS method
- ☐ The properties of concrete at fresh and hardened state
- ☐ The importance and application of special concretes.

PREREQUISITE :

Basic knowledge in concrete design and mixing of concrete.

Note: Prepare the above three items based on details given in syllabus

Sl.No	Topic	No. of Periods	Text /Reference Books	Page No	Method
UNIT I CONSTITUENT MATERIALS					9
Objective:					
To know the constituent materials used for making concrete.					
1	Introduction to Cement, Classification, properties of each type	1	T2	pg.1-27	Chalk and Board and PPT
2	Different Types of Cement – Its chemical composition and Properties	1	T2	pg.28-47	Board and PPT
3	Tests on Cement Based on IS Specifications – Field test and Laboratory Test. Lab Test – Fineness and setting time test	1	T2	pg.47-53	Board and PPT
4	Strength test, soundness test, heat of hydration test and chemical composition test	1	T2	pg.53-65	Board and PPT
5	Classification of Aggregates, source, size, shape, texture, strength, specific gravity and bulk density, moisture content	1	T2	pg.67-79 5 – pg.63-95	Board and PPT
6	bulking factor, cleanliness, soundness, Chemical properties, thermal properties, durability, sieve analysis, grading	1	T2	pg.80-107 5 – pg.63-95	Board and PPT
7	Tests on aggregates as per BIS grading requirements-determination of flakiness index, elongation index, clay, fine silt and fine dust, organic impurities, specific gravity, bulk density and voids.	1	T2	pg.108-112 5 – pg.63-95	Board and PPT
8	Mechanical Properties – determination of aggregate crushing value, ten percent fines value, aggregate impact value, aggregate abrasion value.	1	T2	pg.113-117 5 – pg.63-95	Board and PPT
9	Quality of water for use in Concrete	1	T2	pg.119-123	Board and PPT
Outcome: Able to know the property of material.					

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1. properties of raw material
2. Practice of code book

Sl.No	Topic	No. of Periods	Text /Reference Books	Page No	Method
UNIT II CHEMICAL AND MINERAL ADMIXTURES					9
Objective:					
To know the properties and effect of chemical and mineral admixtures in concrete					
1	Chemical Admixtures – accelerators–their effects on concrete properties	1	T2	pg.149-173,pg. 104-133	Board and PPT
2	Chemical Admixtures – retarders –their effects on concrete properties	1	T2	pg.148-149 pg. 104-133	Board and PPT
3	Chemical Admixtures – Plasticisers –their effects on concrete properties	1	T2	pg.126-129 pg. 104-133	Board and PPT
4	Chemical Admixtures – super plasticizers, water proofers – their effects on concrete properties	1	T2	pg.129-147 pg. 104-133	Board and PPT
5	Chemical Admixtures –water proofers –their effects on concrete properties	1	T2	pg.149-173 pg. 104-133	Board and PPT
6	Mineral Admixtures – Fly ash– their effects on concrete properties	1	T2	pg.174-183 pg. 134-140	Board and PPT
7	<u>Mineral Admixtures –silica Fume –their effects on concrete properties</u>	1	T2	pg.183-186 pg.142	Board and PPT
8	Mineral Admixtures – Ground granulated blast furnace slag– their effects on concrete properties	1	T2	pg.189-192 pg. 141	Board and PPT
9	<u>Mineral Admixtures – metakaoline –their effects on concrete properties</u>	1	T2	pg.188	Board and PPT
Outcome:					
Able to know the properties of admixtures and chemicals used in concrete.					

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1. properties of Chemicals and admixtures.

Sl.No	Topic	No. of	Text	Page No	Method
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		Periods	/Reference Books		
UNIT III		PROPORTIONING OF CONCRETE MIX			9
Objective: To design a concrete mix.					
1	Principles of proportioning	1	T2	pg.458-462 pg.239-240 pg. 2-5	Board and PPT
2	Properties of concrete related to Mix Design.	1	T2	pg.489-494 pg.241 pg. 2-5	Board and PPT
3	Physical properties required for mix design	1	T2	pg.489-494 pg.241-252 pg. 2-5	Board and PPT
4	Design Mix and nominal Mix – BIS method	1	T2	pg.489-498 pg.283-295 pg. 2-8	Board and PPT
5	Design Mix and nominal Mix – BIS method	1	T2	pg.489-498 pg.283-295 pg. 2-8	Board and PPT
6	Method of mix Design	1	T2	pg.489-494 pg.283-295 pg. 2-8	Board and PPT
7	Method of mix Design	1	T2	pg.489-494 pg.283-295 pg. 2-8	Board and PPT
8	Design Examples	1	T2	pg.489-494 pg.305-306 pg. 6-8	Board and PPT
9	Design Examples	1	T2	pg.489-494 pg.305-306 pg. 8-11	Board and PPT
Outcome: Able to know the mix proportion of concrete and grades of concrete.					

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1. Mix proportion for various grade of concrete.

Sl.No	Topic	No. of Periods	Text /Reference Books	Page No	Method
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UNIT IV FRESH AND HARDENED PROPERTIES OF CONCRETE					
9					
Objective: To know the properties and tests as per IS specifications for Concrete in fresh and hardened state.					
1	Tests for fresh concrete – workability- factors affecting workability	1	T2	pg.218-221 pg.146-148	Board and PPT
2	Tests for fresh concrete – slump test	1	T2	pg.222-224 pg.148-149	Board and PPT
3	Tests for fresh concrete – compacting factor test	1	T2	pg.227-228 pg.149-150	Board and PPT
4	Tests for fresh concrete – segregation	1	T2	pg.233-236 pg.159	Board and PPT
5	Tests for fresh concrete – bleeding	1	T2	pg.233-236 pg.159	Board and PPT
6	Tests on Hardened concrete – Determination of Compressive strength	1	T2	pg.420-428 pg.179-180	Board and PPT
7	Tests on Hardened concrete – Determination of flexural strength	1	T2	pg.428-433 pg.180-183	Board and PPT
8	Stress-strain curve for concrete	1	T2	pg.432 pg.190-192	Board and PPT
9	Determination of Young's Modulus	1	T2	pg.432 pg.192-194	Board and PPT
Outcome: Able to know the properties of fresh and harden concrete.					

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1. Properties of fresh and harden concrete
2. Tests on fresh and harden concrete.

Sl.No	Topic	No. of Periods	Text /Reference Books	Page No	Method
UNIT V		SPECIAL CONCRETES			9

Objective:					
To know the properties of special concretes.					
1	Light weight concrete	1	T2	pg.504-514 pg.463-474	Board and PPT
2	High strength concrete	1	T2	pg.318-321	Board and PPT
3	Fibre reinforced concrete	1	T2	pg.526-531 pg.506-531	Board and PPT
4	Ferrocement	1	T2	pg.566-570 pg.495-505	Board and PPT
5	Ready mix concrete	1	T2	pg.248-250	Board and PPT
6	SIFCON, Polymer concrete	1	T2	pg.532-542 pg.532-540	Board and PPT
7	Shotcrete	1	T2	pg.119-123 pg.488-494	Board and PPT
8	High Performance Concrete	1	T2	pg.321-323 pg.576-579	Board and PPT
9	Geo polymer concrete	1	T2	pg.599-602	Board and PPT
Outcome:					
Able to know the properties of special concrete.					

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1. Properties of special concrete

TEXTBOOKS:

1. Gupta.B.L., Amit Gupta, "Concrete Technology", Jain Book Agency, 2010.
2. Shetty,M.S, "Concrete Technology", S.Chand and Company Ltd, New Delhi, 2003
3. Bhavikatti.S.S, “ Concrete Technology”, I.K.International Publishing House Pvt. Ltd., New

Delhi, 2015

4. Santhakumar. A.R., “Concrete Technology”, Oxford University Press India, 2006.

REFERENCES:

1. Neville, A.M; "Properties of Concrete", Pitman Publishing Limited, London, 1995
2. Gambhir, M.L; "Concrete Technology", 3rd Edition, Tata McGraw Hill Publishing Co Ltd, New Delhi, 2007
3. IS10262-2009 Recommended Guidelines for Concrete Mix Design, Bureau of Indian Standards, New Delhi, 1998.
4. Job Thomas, “Concrete Technology”, Cengage Learning India Pvt. Ltd., Delhi, 2015
5. Kumar P Mehta., Paulo J M Monterio., “Concrete - Microstructure, Properties and Materials”, McGraw Hill Education (India) Private Limited, New Delhi, 2016

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