CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF CIVIL ENGINEERING

FEEDBACK ON CURRICULUM -2018-19

ANALYSIS AND ACTION TAKEN REPORT

Structured feedbacks on curriculum are obtained from stakeholders. The suggestions are analyzed and corrective measures suggested by stakeholders are considered.

Sr. No.	Suggestions/Comments	Actions taken
1	Complete process of Mix design, casting and testing to be known to students.	The BoS members accepted the suggestion and mix design exercise was included in Concrete Technology Laboratory.
2	The importance of precast elements and design of end zones in PSC was emphasized to make students aware of the increasing trend in the field.	Topics like precast elements and Anchorage stresses /zones are added in the Prestressed Concrete Course
3	Special concretes used in field production of concrete should be included	Geopolymer concrete and self-curing concrete has been added into the syllabus.

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16CE C21

CONCRETE TECHNOLOGY

Instruction	3 Hours per week
Duration of Semester End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course objectives: To enable the students

1. Learn the properties of various ingredients of concrete.
2. Understand the behaviour of concrete in fresh and hardened states.
3. Understand concrete mix design and compare the quantities using various design methods.
4. To acquire knowledge on the properties and effective usage of various admixtures.
5. Gain knowledge of various special concretes and their applications.

Course outcomes: At the end of the course, the students will be able to

1. Determine the properties of the ingredients of concrete and adjudge their suitability.
2. Determine the properties of fresh and hardened concretes.
3. Carryout concrete mix design and apply statistical quality control techniques for quality assurance.
4. Use admixtures in suitable doses for improvement in various properties of concrete and for use in ready-mix concrete preparation.
5. Employ a special type of concrete depending on the purpose.

UNIT-I:

Constituents of concrete- review: Manufacture of Cement, Types of cements, tests on cements and aggregates.

Properties of Fresh concrete: Batching and Mixing, Workability, factors affecting workability, Measurement of workability using slump cone, compaction factor and V-B time tests, Segregation and bleeding, Compaction of concrete and Types of vibrators.

UNIT-II:

Hardened concrete: Strength of concrete and influencing factors, water- cement ratio, Gel, space ratio, Role of water in the mix, Short term and long term properties of concrete - shrinkage & creep, Types of Shrinkage, Factors affecting shrinkage & creep, Relationship between various mechanical strengths of concrete, Curing of concrete, Methods of curing, Maturity concept, Stress-Strain behaviour of concrete, Durability of concrete.

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UNIT-III:

Mix design of concrete: Basic considerations, Factors to be considered in the choice of mix proportions, Quality control, various methods of mix design- I.S. code method, British and ACI methods.

UNIT-IV:

Admixtures: Classification of admixtures, Mineral and Chemical admixtures, Influence of various admixtures on properties of concrete, Applications, Ready mix concrete (RMC), Fly ash concrete – properties and applications.

UNIT-V:

Special Concretes: High strength concrete, High density concrete, Light weight concrete, Ferro cement, Recycled aggregate concrete, Self compacting concrete (SCC).

Fiber Reinforced Concrete: Need, Mechanism and properties of Fiber reinforced concrete (FRC), Types of Fibers and applications of FRC.

Text Books:

1. A.M Neville., "Properties of Concrete", English Language Book Society / Longman Publications, 1996.
2. M.S. Shetty, "Concrete Technology", S. Chand Publishers, 2005.
3. A. R. Santhakumar, "Concrete Technology", Oxford University, Press 2006.

Suggested Reading:

1. A.M. Neville and J.J. Brooks, "*Concrete Technology*", Dorling and Kindersley Publications, 2006.
2. P. K. Mehta, and J. M. M. Paulo, "*Concrete- Microstructure – properties and Material*", Mc. Graw Hill Publishers, 1997.
3. N. Krishnaraju, "*Design of Concrete Mixes*", CBS Publishers, 2010.

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With Effect from academic year 2018-19

CBIT (A)

16CE C25 **CONCRETE LABORATORY**

Instruction	3 Hours per week
Duration of semester End Examination	3 Hours
Semester Examination	50 Marks
CIE	25 Marks
Credits	2

Course objectives:

1. To understand properties of constituent materials of concrete
2. To comprehend the behaviour of fresh concrete
3. To understand mechanical behaviour hardened concrete
4. To acquire knowledge of conducting Non-Destructive testing on concrete structures

Course outcomes: At the end of this course, students will be able to:

1. Test different concrete mixing materials and issue test reports
2. Assess the workability of field concrete and guide the site supervisor in preparing a good concrete
3. Perform tests on mechanical characteristics of concrete and issue test reports.
4. Handle NDT equipment's and evaluate concrete by NDT methods

List of Experiments:

1. Determination of specific gravity and bulk density of cement.
2. Determination of normal consistency and initial setting time of cement.
3. Determination of compressive strength of cement.
4. Determination of fineness of cement by sieving and by air permeability methods.
5. Determination of specific gravity, bulk density, voids ratio and porosity of fine aggregate.
6. Determination of Bulking of sand by field and laboratory methods of coarse aggregate.
7. Determination of fineness moduli of fine & coarse aggregates.
8. Measurement of workability of design concrete mixes by slump & compaction factor tests.
9. Determination of Compressive, split tensile and flexural strengths of design concrete mixes.
10. Non-Destructive testing of concrete using Rebound hammer & UPV tests.

References:

1. Relevant IS codes and Specifications

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16CE E18

PRE-STRESSED CONCRETE
(ELECTIVE - VIII)

Instruction	3 Hours per week
Duration of Semester End Examination	3 Hours
Semester End Examination	70 Marks
CIE	30 Marks
Credits	3

Course Objectives: To enable the student to

1. The aim of this course is to introduce students to the basic principles about structural behaviour, of pre stressed concrete structures, with reference to IS 1343 code
2. The objective is to equip the students with a thorough understanding of the behaviour and analysis, design of prestressed concrete beam, slab and column.
3. Various time dependent factors, such as cracking, creep and shrinkage of concrete, and prestress losses, are discussed thoroughly.
4. Background to design equations and relevant modern research will also be discussed to provide the students with solid understanding of the topics covered.
5. To provide students with an opportunity to enhance their skills in pre stressed concrete design and applications. The specific implication, to the serviceability and ultimate limit states are covered.

Course outcomes: On successful completion of this course

1. Students will understand the general mechanism of pre stressed concrete members, types of pre stressing, losses in pre stressing, short and long term deflections in P.S.C members.
2. Students will be able to evaluate the behaviour of pre stressed concrete structures,
3. Students will be able to analyze and design of pre stressed concrete structures using serviceability limit states.
4. Student will be able to analyze and design for shear in P.S.C members.
5. Student will be able to analyze the stresses in anchorage zones and design the end anchorages

UNIT-I:

General Principles of Pre Stressed Concrete:

Introduction: Basic concepts – Materials - permissible stresses – Advantages – pre-tensing and post tensing – Pre Stressing by straight Concentric, Eccentric bent and Parabolic Tendons – Different methods of Pre stressing – Hoyer System

– Freyssinet system – Magnel – Blaton system – Lee Mecal system – Use of IS 1343 code, concepts of precast and post tensioned elements.

Losses of Pre stress: Losses in P.S.C. members due to elastic shortening – Shrinkage – Creep in Concrete – Relaxation of Steel – Slip in anchorage – Frictional Loss – Computation of losses.

UNIT – II:

Analysis: Analysis of sections for pre stress and flexure. Deflections of P.S.C members: Importance of deflections - factors influencing deflections, short term and long term deflections – IS code requirements for Maximum deflections – Computation of deflection due to pre stressing force – Dead and live loads – Different cases of loading.

UNIT – III:

Design of Section for Flexure: Allowable stresses – Elastic Design and Limit state method of Design of Rectangular – I Section beams for Flexure – Kern of section – Pressure Line – Cable Profile – IS 1343 Codal Provisions – Check for ultimate flexural strength.

Design of Section for Shear and Torsion: Shear and principal stresses – Cracked and uncracked sections – Codal provisions – Ultimate shear resistance – Design of shear reinforcement in beams – Design of torsional reinforcement in beams.

UNIT – IV:

Anchorage Zone stress in post tensioned members: Stress distribution in End block – A analysis by Magnel and Guyon's methods – IS 1343 code provisions – Bursting Tensile force – Design of anchorage zone reinforcement.

UNIT – V:

Continuous beams: Advantage and Disadvantages – Primary and Secondary moment – P and C lines– Liner transformation concordant and Non concordant cable profile - Analysis and Design of Continuous beams.

Floor slabs: Analysis and design of one way slab and two way slab.

Text Books:

1. N. Krishna Raju, "*Prestressed Concrete*", Tata Mc Graw Hill,2018
2. G.S. Pandit and S.P. Gupta, "*Prestressed Concrete*", CBS Pub., 2009.

Suggested Reading:

1. Arthur H. Nilson, "*Design of Prestressed Concrete*", John Wiley 1987.
2. T.Y Lin and Burn," *Design of prestressed Concrete*",Wiley India Private Limited, 2010.

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