



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

ADVANCED CONCRETE LABORATORY								
I Semester: ST								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BSTD12	Core	L	T	P	C	CIA	SEE	Total
		0	0	4	2	40	60	100
Contact Classes: Nil	Total Tutorials: Nil	Total Practical Classes: 36			Total Classes: 36			
Prerequisite: Concrete Technology Laboratory								

I. COURSE OVERVIEW:

Advanced concrete laboratory provides a comprehensive coverage of the theoretical and practical aspects of the subject and includes the latest developments in the field of concrete construction. It incorporates the latest Indian standard specifications and codes regulating concrete construction. The properties of concrete and its constituent materials and the role of various admixtures in modifying these properties to suit specific requirements, such as ready mix concrete, reinforcement detailing, disaster-resistant construction, and concrete machinery have been treated exhaustively and also special concrete in addition to the durability maintenance and quality control of concrete structure.

II. COURSE OBJECTIVES:

The student will try to learn:

- I. Design of high-grade concrete and study the parameters affecting its performance.
- II. Non-Destructive Testing methods for evaluating the existing structures.
- III. The engineering principles to understand behavior of structural elements.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

- CO 1 Construct the stress-strain curve of high strength concrete for the design of RC structures.
- CO 2 Develop the correlation between cube strength and cylinder strength for understanding the different codal provisions other than IS.
- CO 3 Determine the relation between compressive strength and split tensile strength for the analysis of concrete in tension.
- CO 4 Identify the relation between the compressive strength and modulus of rupture of concrete for understanding the behavior of concrete in rupture.
- CO 5 Test for the Non-Destructive testing of concrete members using rebound hammer and ultrasonic pulse velocity.
- CO 6 Explain the behavior of beams under flexure, shear and torsion for design purpose.

IV. COURSE CONTENT:

Week-I: STRESS STRAIN CURVE FOR CONCRETE

Study of stress-strain curve of high strength concrete.

Week-II: CORRELATION BETWEEN CUBE STRENGTH AND CYLINDER STRENGTH

Correlation between cube strength and cylinder strength.

Week-III: DETERMINATION OF SPLIT TENSILE CONCRETE

Split tensile strength.

Week-IV: DETERMINATION OF MODULUS OF RUPTURE CONCRETE

Modulus of rupture.

Week-V: RELATION BETWEEN COMPRESSIVE STRENGTH AND SPLIT STRENGTH

Correlation between compressive strength and cylinder strength.

Week-VI: RELATION BETWEEN COMPRESSIVE AND MODULUS OF RUPTURE

Effect of cyclic loading on steel.

Week-VII: NON – DESTRUCTIVE TEST (NDT)

Non-Destructive testing of existing concrete members.

Week-VIII: PERMEABILITY OF CONCRETE TEST

Permeability of concrete test.

Week-IX: SHEAR STRENGTH TEST

Behavior of Beams under Shear.

Week-X: TORSION STRENGTH TEST

Behavior of Beams under Torsion.

V. TEXT BOOKS:

1. Shetty, M. S., "Concrete Technology", S. Chand and Co. Publishers, 3rd edition, 2006.
2. Taylor, Walter Harold. "CONCRETE TECHNOLOGY AND PRACTICE, 4/E." (1967).

VI. REFERENCE BOOKS:

1. Munford, Paul, and Paul Normand. Mastering Autodesk Inventor 2016 and Autodesk Inventor LT 2016: Autodesk Official Press. John Wiley & Sons, 2015.
2. Dr. M.N. Sessa Praksh and Dr. G.S. Servesh, "Computer Aided Design Laboratory", Laxmi Publications, 1st edition, 2016.

VII. ELECTRONICS RESOURCES:

1. <http://kec.edu.np/wp-content/uploads/2017/06/Advanced-Concrete-Technology.pdf>.
2. <http://alphace.ac.in/downloads/notes/cv/10cv81.pdf>.

VIII. MATERIALS ONLINE:

1. Course Template
2. Tutorial Question Bank
3. Assignments
4. Model Question Paper – I
5. Model Question Paper - II
6. Lecture Notes
7. Power point presentation