

## ADVANCED CONCRETE LABORATORY

<b>I Semester: ST</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
<b>BSTC12</b>	<b>Core</b>	L	T	P	C	CIA	SEE	Total
		0	0	4	2	30	70	100
<b>Contact Classes: Nil</b>		<b>Total Tutorials: Nil</b>		<b>Total Practical Classes: 36</b>		<b>Total Classes: 36</b>		
<b>I. COURSE OVERVIEW:</b>								
<p>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.</p>								
<b>II. COURSE OBJECTIVES:</b>								
<b>The student will try to learn:</b>								
<ol style="list-style-type: none"> <li>I. Design of high grade concrete and study the parameters affecting its performance.</li> <li>II. Non Destructive Testing methods for evaluating the existing structures.</li> <li>III. The engineering principles to understand behavior of structural elements.</li> </ol>								
<b>III. COURSE OUTCOMES:</b>								
<b>After successful completion of the course, students should be able to:</b>								
CO 1	Construct the stress-strain curve of high strength concrete for the design of RC structures.						Apply	
CO 2	Develop the correlation between cube strength and cylinder strength for understanding the different codal provisions other than IS.						Analyze	
CO 3	Determine the relation between compressive strength and split tensile strength for the analysis of concrete in tension.						Analyze	
CO 4	Identify the relation between the compressive strength and modulus of rupture of concrete for understanding the behavior of concrete in rupture.						Analyze	
CO 5	Test for the Non-Destructive testing of concrete members using rebound hammer and ultrasonic pulse velocity.						Analyze	
CO 6	Explain the behavior of beams under flexure, shear and torsion for design purpose.						Understand	
<b>IV. SYLLABUS:</b>								
<b>Week-I: STRESS STRAIN CURVE FOR CONCRETE</b>								
Study of stress-strain curve of high strength concrete.								
<b>Week-II: CORRELATION BETWEEN CUBE STRENGTH AND CYLINDER STRENGTH</b>								
Correlation between cube strength and cylinder strength.								
<b>Week-III: DETERMINATION OF SPLIT TENSILE CONCRETE</b>								
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, 3<sup>rd</sup> Edition, 2006.

**VI.REFERENCE BOOKS:**

1. Mastering Auto cad 2016 and Auto Cad LT 2016 from AUTO Desk.
2. Dr. M.N. SessaPraksh and Dr. G.S. Servesh, “Computer Aided Design Laboratory”, Laxmi Publications, 1<sup>st</sup> Edition, 2016.

**VII. WEB REFERENCES:**

1. <http://kec.edu.np/wp-content/uploads/2017/06/Advanced-Concrete-Technology.pdf>.

**VIII. E-TEXT BOOKS:**

1. <http://alphace.ac.in/downloads/notes/cv/10cv81.pdf>.