

|| Jai Sri Gurudev||  
**Sri Adichunchanagiri Shikshana Trust (R)**  
**ADICHUNCHANAGIRI UNIVERSITY**  
**BGS Institute of Technology**

**B. E. CIVIL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**

<b>18CVL57</b>	<b>Course Code</b>	<b>CONCRETE AND HIGHWAY MATERIAL TESTING LAB</b>	<b>Course Title</b>	<b>V</b>	<b>Semester</b>
<b>2</b>	<b>Credits</b>	<b>1- 0 - 2 -3</b>	<b>L - T - P -TL*</b>	<b>42 Hours</b>	<b>Teaching Period</b>
<b>100 Marks</b>	<b>Total</b>	<b>60 Marks</b>	<b>SEE*</b>	<b>40 Marks</b>	<b>CIE*</b>
*NOTE: L – Lecture; T – Tutorial; P – Practical; TL – Total; <b>CIE – Continuous Internal Evaluation; SEE – Semester End Examination</b>					

<p><b>Course Learning Objectives:</b>  This course will enable students</p> <ol style="list-style-type: none"> <li>1. To learn the procedure of testing concrete ingredients and properties of concrete as per standard code recommendations.</li> <li>2. To learn the procedure of testing bituminous materials as per standard code recommendations.</li> <li>3. To relate material characteristics to various application of construction.</li> </ol>	<p><b>Number of Lecture Hours/Week</b></p>
<p><b>Module 1: Experiments on Cement and Concrete</b></p> <ol style="list-style-type: none"> <li>a. Test on cement: Normal Consistency, Setting time, Compressive strength and Specific gravity</li> <li>b. Design of concrete mix as per IS-10262</li> <li>c. Tests on fresh concrete: Slump, Compaction factor and Vee-Bee test</li> <li>d. Tests on hardened concrete: Compressive strength test, Split tensile strength test and Flexural strength test</li> </ol> <p><b>Module 2: Experiments on Highway materials</b></p> <ol style="list-style-type: none"> <li>a. Tests on Aggregates: Aggregate Crushing value, Los Angeles abrasion test, Aggregate impact test, Aggregate shape tests (combined index and angularity number)</li> <li>b. Tests on Bituminous Materials: Penetration test, Ductility test, Softening point test, Specific gravity test and Viscosity test by tar viscometer</li> <li>c. Tests on Soil: Sieve analysis and CBR test</li> </ol>	<p><b>03 Hours (1 Hour Instruction + 2 Hours Laboratory)</b></p>
<p><b>Course outcomes:</b>  During this course, students will develop expertise in;</p> <ol style="list-style-type: none"> <li>1. Able to interpret the experimental results of concrete and highway materials based on laboratory tests.</li> <li>2. Determine the quality and suitability of cement.</li> <li>3. Design appropriate concrete mix Using Professional codes.</li> <li>4. Determine strength and quality of concrete.</li> <li>5. Test the soil for its suitability as sub grade soil for pavements.</li> </ol>	
<p><b>Question paper pattern:</b></p> <ul style="list-style-type: none"> <li>• All are individual experiments</li> <li>• Instructions as printed on the cover page of answer script for split up of marks to be strictly followed</li> </ul>	

- All exercises are to be included for practical examination.

**Reference Books:**

1. M.L.Gambir, "Concrete Manual", Danpat Rai and sons, New Delhi
2. Shetty M.S, "Concrete Technology", S. Chand & Co. Ltd, New Delhi.
3. Mehta P.K, "Properties of Concrete", Tata McGraw Hill Publications, New Delhi.
4. Neville A M, "Properties of Concrete", ELBS Publications, London.
5. Relevant BIS codes.
6. S K Khanna, C E G Justo and A Veeraragavan, "Highway Materials Testing Laboratory Manual ", Nem Chand Bros, Roorkee
7. L R Kadiyali, "Highway Engineering ", Khanna Publishers, New Delhi