GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING (Autonomous)
Approved by AICTE, New Delhi and Affiliated to JNTU-Kakinada
Accredited by NBA & NAAC with "A" Grade with a CGPA of 3.47/4.00

DEPARTMENT OF CIVIL ENGINEERING

<u>SCHEME OF COURSE WORK</u>

Course Title	Highway Engineering Laboratory			
Course Code	20CE1110	**L P C**		**: 0 0 3 1.5**
Program:	B. Tech.			
Specialization:	Civil Engineering			
Semester	Professional Core			
Prerequisites	None			
Courses to which it is a prerequisite		None		

Course Outcomes (COs):

At the end of the course, the student will be able to:

CO1: Determine engineering properties of aggregates.

CO2: Evaluate bitumen properties.

CO3: Design a bituminous concrete mix.

CO4: Design the overlay thickness using different methods

CO5: Interpret traffic studies using traffic volume data, spot speed and parking volume data

Program Outcomes (POs):

Graduates will be able to:

1	Apply the knowledge of mathematics, science, engineering fundamentals to solve complex civil engineering problems.
2	Identify, formulate and analyse problems related to civil engineering and substantiate the conclusions.
3	Design solutions for civil engineering and system components and process that meet the specified needs with appropriate consideration to public health and safety.
4	Perform analysis and interpretation of data by using research methods such as design of experiments to synthesize the information and to provide valid conclusions.
5	Select and apply appropriate techniques from the available resources and modern civil engineering and software tools, and will be able to predict and model complex engineering activities with an understanding of the practical limitations.
6	Carry out their professional practice in civil engineering by appropriately considering and weighing the issues related to society and culture.
7	Understand the impact of the professional engineering solutions on environmental safety and legal issues.
8	Transform into responsible citizens by resorting to professional ethics and norms of the engineering practice.
9	Function effectively in individual capacity as well as a member in diverse teams and in multidisciplinary streams.
10	Communicate effectively on complex engineering activities with the engineering community and society.
11	Demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments.
12	Engage themselves in independent and life – long learning in the broadest context of technological change while continuing professional practice in their specialized areas of civil engineering.

PSOs:

1. Collect, process and analyse the data from topographic surveys, remote sensing, hydrogeological investigations, geotechnical explorations, and integrate the data for planning of civil engineering infrastructure.
2. Analyse and design of substructures and superstructures for buildings, bridges, irrigation structures and pavements.
3. Estimate, cost evaluation, execution and management of civil engineering projects.

Course Outcome versus Program Outcomes & Program specific outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	-	-	-	2	-	2	-	-	1	1	2
CO2	3	1	-	-	-	-	-	2	-	2	-	-	1	1	2
CO3	3	-	1	-	-	-	-	2	-	1	-	-	1	2	2
CO4	2	1	1	-	-	-	-	2	-	1	-	-	1	2	2
CO5	3	2	2	-	1	-	-	1	2	1	-	-	1	1	1

3 - Strongly correlated, 2 - Moderately correlated, 1 - Low correlation, Blank - No correlation

Assessment Methods:	Assignment / Viva / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week No.	Topic / Contents	CO	Sample Questions	Teaching-Learning Strategy	Assessment Method & Schedule
1	Introduction to Laboratory	1 to 5		Lecture	
2-8	1. Find the Aggregate Crushing value 2. Calculate the Aggregate Impact Test. 3. Find Specific Gravity and Water Absorption. 4. Perform Los Angeles Abrasion Test. 5. Find Elongation Index, Flakiness Index and Angularity Number from Shape test 6. Find Viscosity Test & Flash and fire point tests of bitumen. 7. Calculate the Ductility value of bitumen. 8. Find the Softening Point Test	1,2	Find the aggregate crushing value of given aggregate Find out the flakiness, Elongation Index & Angularity Number Find the flash & fire point of given bitumen Find the ductility of given bitumen	Experiment	Observation, Record correction and Viva
9	**MID TEST – I**				
10-14	10. Find OBC from Marshall mix design 11. Find Specific Gravity of bitumen 12. Perform Traffic volume studies 13. Find Spot speed studies characteristics 14. Perform Parking study 15. Perform Benkelman beam 16. Perform Unevenness Index by MERLIN	3,4,5	1. Find the softening point of given bitumen specimen. 2. Conduct traffic volume study and analyze the data. 3. Conduct spot speed study and analyse the data.		Observation Record and Viva
15	**MID TEST – II**				
16	**END EXAM**				