

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - Civil Engineering
SEMESTER: V

Subject Name: **Highway Engineering**
 Subject Code: **X50601**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (E)	Mid Sem Exam (Theory) (M)	Practical (Internal)
4	0	2	6	70	30	50

Sr. No	Course Content
1.	<p>Highway Planning and Development :</p> <p>Highway planning in India, development, rural and urban roads, road departments in India, road classification, road authorities i.e. IRC, CRRI, CRF, HRB, NHAI, NHDP, PMGSY etc.</p>
2.	<p>Field Surveys:</p> <p>Reconnaissance, aerial surveys, location surveys, location of bridges, problems in rural and urban areas.</p>
3.	<p>Highway Geometric Design :</p> <p>Topography and physical features, cross section elements like pavement widths, carriageway width, formation width, land width, right of way, road boundaries, etc., friction, light reflecting characteristics, roughness, camber, sight distances, horizontal alignment, design speed, minimum and ruling radius, super-elevation, transition curve, gradients, design of summit and valley curves.</p>
4.	<p>Road Sub-Grade:</p> <p>Soil and its classification, soil investigation, CBR, important characteristics, tests.</p>
5.	<p>Road Material:</p> <p>Aggregates and their types, physical and engineering properties, tests, fillers, bitumen, characteristics, emulsions and cutbacks, tests.</p>
6.	<p>Pavements:</p> <p>Design of flexible (G.I. method and CBR method) and rigid pavements (Westergaard method), maintenance of pavements.</p>

7.	Drainage: Surface and sub-surface drainage arrangements and sketches.
8.	Mountain Roads: Elementary principles of alignment in hilly areas and drainage.
9.	Roadside Amenities: Arboriculture, street lighting, road safety.
10.	Traffic Engineering: Road user characteristics, vehicular characteristics, traffic flow characteristics, speed, traffic volume studies, parking studies - definition, purpose, types, survey methods. Accident studies - purpose, types, causes, collision diagram, condition diagram, preventive measures. Traffic control devices like pavement marking, signs, signals etc. traffic management, various types of intersection and their design criteria.

Term Work:

Term work shall be based on the above mentioned course content.

Reference Books:

1. Highway Engineering by Khanna & Justo
2. Traffic Planning and Design by Subhash Saxena
3. Traffic Engineering by L.R. Kadiyali
4. Principles of Transportation Engineering by Animesh Das & Partha Chakroborty