

# GUJARAT TECHNOLOGICAL UNIVERSITY

## Diploma in Transportation Engineering

Semester: 4

**Subject Name** HIGHWAY ENGINEERING

Sr. No.	Course content
1.	<b>Introduction</b>  Importance of Transportation, Difference modes of Transportation, Characteristics of Road Transport, Importance of Road in India, Scope of Highway Engineering
2.	<b>Highway Development and Planning</b>  Historical Development of Road Construction, Highway Development in India, Necessity of Highway Planning, Classification of Roads, Road Patterns, Planning Surveys, Preparation of Plans, Interpretation of Planning Surveys, Preparation of Master Plan and its Phasing, Highway Planning in India
3.	<b>Highway Alignment and Surveys</b>  Introduction, Engineering Surveys for Highway Location, Drawing and Report, Highway Project
4.	<b>Highway Geometric Design</b>  Introduction, Highway Cross-Section Elements, Camber, Kerb, Width of Pavement, Traffic Separator or Median, Road Margin, Formation Width, Right of Way, Sight Distance, Stopping Site Distance, Overtaking Site Distance, Sight Distance at Intersection, Design of Horizontal Alignment, Horizontal Curve, Design Speed, Super Elevation, Widening of Pavement on Horizontal Curve, Setback Distance on Horizontal Curve, Horizontal Transition Curve, Design of Vertical Alignment, Gradient, Vertical Curve, Summit Curve, Valley Curve
5.	<b>Highway Pavement</b>  Introduction, Design Factors, Types of Pavement Structure, Flexible Pavement, Rigid Pavement, Semi-rigid Pavement, Functions of Pavement Components, Factors to be Considered in Design of Pavement
6.	<b>Soil Stabilized Roads</b>  Introduction, Mechanics of Soil Stabilization, Investigation for Soil Stabilized Road, Soil Stabilization Methods, Mechanical soil Stabilization, Soil-Cement Stabilization, Soil-Lime Stabilization, Stabilization of soil using Bituminous Materials, Special Problems in Soil Stabilization, Problems in Selection of Stabilization technique, Problems in Mix Design, Problems in thickness design of Stabilized layers, Stabilization of Black Cotton Soils, Stabilization

	of Desert Sand
<b>7.</b>	<b>Highway Drainage</b> Introduction, Importance, Types of Drainage, Surface Drainage, Sub-Surface Drainage, Drainage of Hill Roads, Maintenance of Drainage of Hill Roads, Drainage of Slope and Erosion Control, Road Construction in Water-Logged Areas
<b>8.</b>	<b>Road side Development</b> Introduction, Road Side Development and Arboriculture, Planning of Plantation, Species and their Selection, Care of Trees
<b>9.</b>	<b>Highway Economics and Finance</b> Introduction, Highway User Benefits, Highway Costs, Economic Analysis, Highway Finance

#### **REFERENCES BOOK:**

1. Highway Engineering by S.K.Khanna and C.E.G.Justo, Nem chand Bros. Roorkee.
2. Highway Engineering by S.P.Bindra Dhanpat Rai & Sons, Delhi
3. Principles and Practice of Highway Engineering by S.C.Sharma and C.C.Sharma ,  
Asia Publishing House ,Delhi
4. Highway Engineering By L.R.Kadiyali
5. Highway Engineering & Airports By K.L.Bhagat & S.B.Bhagat ,S.Chand & Co., Delhi
6. Highway Engineering by S.C. Rangwala
7. Transportation Engineering Vol. I & II By Vazirani & Chandola