

GUJARAT TECHNOLOGICAL UNIVERSITY
BRANCH NAME: B. Arch
SUBJECT NAME: Infrastructure-II (Traffic awareness and Road safety)
SUBJECT CODE: 2X95015
5th Year: Semester-IX

Pre requisite: It is assumed that students, taking this elective course, have the basic understanding of civic standards of urban roads and connections in terms of the human safety.

Rationale: To introduce the concepts, principles, tools and aids of Road Safety and Civic Sense to the students. To acquaint them with the design and safety standards for roads. Also inculcate the practice of safe road behaviour and civic sense among them.

Teaching and Assessment Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks	University Exam Type
Field work	Lectures	Studio	C	External Exam		Internal Exam		100	VIVA
1	2	1	04	(ESE) Theory	(ESE) Viva	(PA) Theory	(PA) Viva		
				00	50	00	50		

Content:

Sr. No	Content	Total Hours	Weight age
1	<p>Introduction:Road as an active space, Types of Users, User Behaviour, Sensory Factors like Vision and Hearing in User Behaviour.</p> <p>Types of Vehicles: Heavy Vehicles, Light Motor Vehicle, Two Wheelers, Auto-Rickshaw, Bicycles and Cycle Rickshaw, Non-Motorised Vehicles.</p> <p>Vehicle Characteristics: Dimensions, Weight, Turning Radii, Braking Distance, Lighting System, Tyres, etc. Type of Hazards: Conflicts and Accidents.</p>	08	10%
2	<p>Typology of Roads: Components and Design</p> <p>Road Classification: National Highways, State Highways, District Roads (MDR and ODR), Village Roads.</p> <p>Urban Road Classification: Expressways, Arterial, Sub-Arterial, Collector, Local; Service Roads, One-Way, Two-Way 'etc.</p> <p>Mountainous Roads. Speed Limits Of the Road types.</p> <p>Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Cycling Track, Green Strip, Curbs, Camber, etc. Spatial Standards for the Cross-Section Design. Relationship between Road Design and Road Safety.</p>	12	15%
3	<p>Intersections</p> <p>Types of Road Intersections: Basic Forms of at-grade Junctions (T, Y, Staggered, Skewed, Cross, Scissors, Rotary, etc. Grade Separated Junctions (with or without interchange): Three-Leg, Four-Leg, Multi-Leg, etc.</p> <p>Design of Intersections: Design and Spatial Standards for Traffic Islands, Turns, Turning Radii, Directional Lanes, Pedestrian</p>	12	20%

	<p>Crossings, Median Openings, Traffic Calming Components like Speed Breakers and Table-Top Crossings etc.'</p> <p>Design Considerations for Diverging, Merging, and Weaving Traffic. Location and Design for Traffic Signals</p>		
4	<p>Pedestrian Circulation and Barrier Free Design</p> <p>Requirement of Pedestrian Infrastructure: Sidewalks and Footpaths, Recommended Sidewalk Widths, Pedestrian Crossings, Pedestrian Bridges, Subways, Cycle Tracks, etc.</p> <p>Barrier Free Design: Location and Design Standards for Ramps for Wheel Chair Access, Other Provisions like Tactile for Visually Challenged etc.</p> <p>Safety Provisions: Pedestrian Railings, Anti-skid Flooring, Pedestrian Signal, Walk Button, etc.</p>	12	20%
5	<p>5. Traffic Signs and Road Markings</p> <p>Type for Traffic Signs: Principles and Types of Traffic Signs, Danger Signs, Prohibitory Signs, Mandatory Signs, Informatory Signs, Indication Signs, Direction Signs, Place. Identification Signs, Route Marker Signs, etc. Reflective Signs, LED Signs. Static and Dynamic Signs.</p> <p>Standards for Traffic Signs: Location, Height and Maintenance of Traffic Signs</p> <p>Types of Road Markings: Centre Lines, Traffic Lane Lines, Pavement Edge Lines, No Overtaking Zone Markings, Speed Markings, Hazard Markings, Stop Lines, Pedestrian Crossings; Cyclist Crossings, Route Direction Arrows, Word Messages, Marking at Intersections, etc.</p> <p>Material, Colour and Typography of the Markings. Traffic Control Aids: Roadway Delineators (Curved and Straight Sections), Hazard Markers, Object Markers, Speed Breakers, Table Top Crossings, Rumble Strips, Guard Rails, Crash Barriers etc.</p> <p>Street Lighting: Need for Street Lighting, Type of Lighting, Illumination Standard, Location and Intermediate Distance.</p>	08	10%
6	<p>Road Accidents</p> <p>Nature and Types of Road Accidents (Grievously Injured, Slightly Injured, Minor Injury, Non-Injury, etc.) The situation of Road Accidents in India (Yearly), Fatality Rates, etc.</p> <p>Factors (and Violations) that cause accidents, Prevention and First Aid to Victims</p> <p>Collision Diagrams and Condition Diagrams exercises.</p> <p>Traffic Management Measures and their influence in Accident Prevention</p>	04	05%

7	<p>Road Safety and Civic Sense Need for Road Safety, Category of Road Users and Road Safety Suggestions. Precautions for Driving in Difficult Conditions (Night, Rain, Fog, Skidding Conditions, Non-Functional Traffic Lights, etc.) Types of Breakdowns and Mechanical Failures. Accident Sign (Warning Light, Warning Triangle, etc.) Introduction to Concept of Civic Sense and its relationship to Road Safety: Importance of Civic Sense, Road . Etiquettes and Road User Behaviour, Rules of Road, Right of the Way. Providing Assistance to Accident Victim. Sensitisation against Road Rage</p>	04	05%
8	<p>Traffic Regulations, Laws & Legislations: Indian Motor Vehicles Act (Chapter VIII: Control of Traffic to be discussed in detail) Regulations Concerning Traffic: Cycles, Motor Cycles and Scooters, Rules for Pedestrian Traffic, Keep to the Left Rule, Overtaking Rules, Turning Rules, Priority Rules, Hand Signals, etc. Speed and Hazard Management. Penal Provisions. National Road Safety Policy, Central Motor Vehicle Rules, State Motor Vehicle Rules Introduction to Good Practices.</p>	04	05%

*: indicative

References:

1. Introduction to Traffic Engineering, R Srinivasan Kumar
2. Traffic Engineering and Transport Planning, LR Kadiyali.
3. Book on Road Safety Signage and Signs, Ministry of Road Transport and Highways, Government of India.
4. MORT&H Pocketbook for Highway Engineers, 2019 (Third Revision)
5. Publications by UTTIPEC namely, Street Design Guidelines, UTTIPEC Guideline for Road Markings, UTTIPEC Guideline and Specification for Crash Barriers, Pedestrian Railing and dividers, UTTIPEC Standard Typical Crossing Design .
6. Street Design Standards as provided in Timesavers, Neuters etc.
7. Publications by Indian Road Congress.

List of Projects/Assignments*:

Lectures/Tutorial work shall consist of presentations on various topics of the subject. AV projects may be introduced to students for documenting best practices and advances through case studies. A group discussion or forum may be organized for discussion on various aspects of the subject.

*- this is suggestive for common purpose. Faculty may decide on this, considering student group and institution philosophy.