GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor / Honours Syllabus)

Subject Code : N116AF02

Subject Name : Intelligent Transportation for Smart City

WEF Academic Year :	2025-26
Semester :	6
Category of the Course :	Compulsory

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	00	30	00	100

Course Content :

Unit No.	Course Content	No. of Hours	Mapped CO
1	**Module 1:- Basics of ITS:** Introduction to Intelligent Transportation Systems (ITS) - Definition – Role and Responsibilities, Smart Parking System, Advanced Traveller Information System, Fleet Oriented ITS Services, Electronic Toll Collection, Critical issues, Security, Safety.	09	CO-1
2	**Module 2:- Framework & Hardware for ITS:** ITS Architecture Framework, Hardware Sensors, Vehicle Detection – Techniques, Dynamic Message Sign., GPRS, GPS, Toll Collection.	09	CO-1
3	**Module 3:- Advanced Transportation Management System:** Video Detection – Cameras, Infrared (IR) Lighting, Integrated Traffic Management, Control Centre, Junction Management Strategies- Advance Transport Management System (ATMS), Advanced Traveler Information Systems (ATIS) - Route Guidance, Data Collection – Analysis, Dynamic Traffic Assignment (DTA) – Components – Algorithm, Coordination of multi-modal transport systems, Incident Management.	10	CO-2,CO-3
4	**Module 4:- Advanced Traveller Information System:** Travel Information, Pre Trip and enroute Methods-Basic ATIS Concepts, Smart Route System, Data Collection–Process, Dissemination to Travelers, Evaluation of Information, Value of Information.	09	CO-2,CO-3

5	**Module 5:- Case studies:** Automated Highway Systems, Vehicles in Platoons, Integration of Automated Highway Systems, ITS Programs in the World, Overview of ITS implementations in developed countries, ITS in developing countries.	08	CO-4
	Total Hrs.	**45**	

Reference Book(s) :

1. Thomas Abdallah, (2017), "Sustainable mass transit : challenges and opportunities in urbanpublic transportation", Amsterdam, Netherlands : Elsevier, (ISBN9780128112991).
2. Mintesnot G. Woldeamanuel,(2016), "Concepts in urban transportation planning : the quest for mobility, sustainability and quality of life", Jefferson Mcfarland (ISBN 9780786499663).
3. Eric Christian Bruun,(2014), "Better public transit systems : analyzing investments andperformance", London : Routledge,(ISBN- 9780415706001).
4. Peter White,(2017), "Public transport : its planning, management and operation", Abingdon,Oxon ; New York, NY : Routledge(ISBN-9781138936508).
5. David Bissell, (2018), "Transit life : how commuting is transforming our cities", Cambridge, MA : The MIT Press, (ISBN-9780262037563)
6. Ghosh, S., Lee, T.S.,(2000), "Intelligent Transportation Systems: New Principles andArchitectures", CRC Press.
7. Mashrur A. Chowdhury, and Adel Sadek,(2003), "Fundamentals of Intelligent TransportationSystems Planning", Artech House, Inc.
8. R.P Roess, E.S. Prassas, W.R. McShane, (2004), "Traffic Engineering, Pearson Educational International", Third Edition.

Course Outcome :

After Completion of the Course, Student will able to:

Sr. No.	Course outcome	Marks % weightage
CO-1	Understand the necessity and component of sustainable and smart urban transport.	25
CO-2	Understand strategies to benefit cities from smart mobility solution, its challenges and opportunities.	30
CO-3	Understand Digitalization, Intelligent Transport Systems.	25
CO-4	Learn and apply various ITS technologies according to Local scenario.	20

Suggested Specification table with Marks :
Suggested Specification table (Theory) :

Distribution of Theory Marks (%)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15 %	25 %	20 %	20 %	10 %	10 %

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Suggested Specification table with Marks :

*R: Remember, U: Understand, A: Apply, N: Analyze, E: Evaluate, C: Create

List of Tutorials :

1. Intelligent Transportation system (ITS) implementations.
   - Understanding of ITS in detail.
   - Preparing detailed study of frame work for hardware.
2. Advancement in rapid transport management.
   - Prepare report on Advance Traveler Information system (ATIS) in detail.
   - Study of survey on any stretch to determine spot speed-case study.
3. Advanced Transport Management System study.
   - Detailed study of Advanced Transport Management System (ATMS).
4. Studying Static Preference Survey.
   - Understanding Revealed Preference Survey.
5. Case Studies on Urban transportation infrastructure.
   - Study of Automated Highway systems.
   - Preparing various case studies on advancements in urban transportation system.
   - Learning from Command & control center in urban area.

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