GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor Of Engineering (Minor / Honours Syllabus)

Subject Code : N116AF01

Subject Name : Infrastructure for Smart City Planning

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

Teaching and Examination Scheme :

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	2	0	4	70	0	30	0	100

Course Content :

Unit No	Course Content	No of Hours	Mapped CO
1	**Module 1:- Planning of Infrastructure for smart city:** Smart city fundamental model, Characteristics of smart city planning, Framing and assessing of Infrastructure planning for Smart city, Challenges in planning smart city.	09	CO-1
2.	**Module 2:- Infrastructure for Water sector in smart city:** Various water conservation and Recharging techniques, Rainwater harvesting system and automations, Urban flood control management in cities, Flood forecasting and warning through automations, Smart city water logging preventions, Smart toilets for sanitation and hygiene, IoT based water and waste water management for smart city.	13	CO-2
3	**Module 3:- Smart Urban Transportation System Planning:** Effective and eco-friendly MRTS - like BRTS, LRT, Metro Rail, adaptive and coordinated traffic signals, smart road/rail network, smart noise level and emission level measuring system, provision of safe pedestrian and non-motorized vehicle transportation, efficient goods vehicle movement Sustainable traffic signal management, Transport network performance, Impact of transportation on Environment, climate change, Challenges for Health and safety of residents, Mobility and accessibility, Freight movements and logistics performance.	12	CO-3

4.	**Module 4:- Sustainable Smart City Planning:** Concept of Building Information Modeling (BIM) in infrastructure planning for smart city, Principles of green building, sustainable solar energy management and Wind energy management for smart city, Eco-friendly infrastructure management, Sustainable infrastructure for Health sector, Infrastructure development- Case Studies of smart cities in Gujarat, India and world.	11	CO-4
	Total Hrs.	**45**	

Reference Books:

1. Arup Mitra; "Insights into inclusive growth, employment and wellbeing in India"; Springer(2013), New Delhi (ISBN: 978-81-322-0655-2).

2. "Draft Concept Note on Smart City Scheme". Government of India - Ministry of UrbanDevelopment(http://indiansmartcities.in/downloads/CONCEPT_NOTE_3.12.2014_REVISED_AND_LATEST.pdf).

3. Jo Beall (1997); "A city for all: valuing differences and working with diversity"; Zed bookslimited, London (ISBN: 1-85649-477-2).

4. John S. Pipkin, Mark E. La Gory, Judith R. Balu (Editors); "Remaking the city: Social science perspective on urban design"; State University of New York Press, Albany (ISBN: 0- 87395-678-8).

5. UN-Habitat; "Inclusive and sustainable urban planning: a guide for municipalities"; Volume Urban Development Planning (2007); United Nations Human Settlements Programme (ISBN: 978- 92-1-132024-4).

6. William J. V. Neill (2004); "Urban Planning and cultural identity"; Routledge, London (ISBN: 0-415-19747-3).

7. Marta Peris-Ortiz, Dag R. Bennett,Diana Pérez-Bustamante Yábar,(2016) "SustainableSmart Cities" Springer ,(e ISBN: 978-3-319-40895-8).

Course Outcome :

Sr. No.	Course Outcomes	Marks % weightage
CO-1	Understand various aspects of basic principles of infrastructure for smart city planning.	25
CO-2	Study, analyze and improvement water resources management of existing Indian cities planning.	30
CO-3	Understanding sustainable infrastructure for urban transportation in development of smart city.	25
CO-4	Apply principles in designing the new smart city plan and creating sustainable eco-friendly infrastructure.	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)

List of Tutorials:

1. Sustainable and Eco friendly, Green building infrastructure for smart city planning.
   - Understanding standards Eco friendly building.
   - Developing various Green building for smart city.
2. Automations in Rainwater harvesting and government policies.
   - Preparing rain harvesting model for a building.
   - Understanding various recharging structures models.
3. Sewerage system infrastructure Planning and government initiatives.
   - Studying of Smart Toilets initiatives taken by government.
   - Learning Infrastructure for Sanitation and maintaining hygiene in health sectorfor smart city.
4. Implementations of Mass transit in urban transport system for smart city.
   - Studying various rapid mass transportation modes.
   - Understanding various initiatives taken by Government.
5. Various case studies on Smart city initiatives undertaken by Government of Gujarat,India and around the world.
   - Preparing a report on Case studies on smart city in India and world.

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