GUJARAT TECHNOLOGICAL UNIVERSITY

Minor Degree (BE) : Next Generation Smart Village

Subject Code : N116AD01

Semester - 6 (w.e.f. AY 2025-26)

Subject Name : Concepts of Green & Smart Village

Type of course : Compulsory

Prerequisite : Basic Concept of Smart Village and Infrastructural Gap analysis.

Rationale : To develop basic understanding about developing various infrastructure using smart and sustainable technologies.

Teaching and Examination Scheme :

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	00	00	00	70

Content :

Sr. No.	Content	Total Hrs
1	**Introduction of Green & Smart Village:** Importance and Technological Requirements for Green & Smart Village, Objectives & Various application areas, Managerial Implications, Strategies & technologies suggested in SAGY for Adarsh Gram.	02
2	**Green & Smart Building Construction:** Zero-Energy Buildings, Water & Energy efficient buildings, Waste Reduction, Passive lighting, Passive Heating, Use of local available materials.	03
3	**Green & Smart Environment:** Green Environment, Green Products, Green Technologies, Environment Spheres.	03
4	**Green & Smart Healthcare:** Green Hospital Building Design, Energy Management, Water and Waste management, mHealth and pHealth Systems, eLearning for Green Healthcare.	03
5	**Climate Change and Village action Plan:** Climate change and mitigation, Disaster management practices, Prevention of soil erosion, Agro forestry.	02
6	**Green & Smart Education:** Advanced Technologies, Smart Learner, Smart Teacher, Smart Pedagogy, Smart Learning Environment.	03

7	**Green & Smart Agriculture:** Smart Monitoring, Automation, Smart crop management, Precision farming, Smart Greenhouses, Smart water distribution networks.	04
8	**Smart Security:** RFID, Wireless Sensor Networks, Cloud Computing, Applications for Securing Application and Transactions.	04
9	**Transportation:** DRT - Demand Responsive Transport, ISS – Interchange shuttle service, DRS – Dynamic ridesharing service, Strategy & Management, Mobility-as-a-Service (MaaS) Strategy, Use of clean fuels like Bio-fuels and CNG, electric and solar powered vehicles, Use of Non-motorized and Animal drawn vehicles.	05
10	**Green & Smart Energy Management:** Efficient Distribution and Transmission of Electricity, Waste Heat, Networking Solutions, Routers, Connectivity and Cloud Services.	04
11	**Green & Smart Water, Waste water and Solid Waste Management:** Smart water distribution grids, Quality and Quantity of Water, Collection of waste: Liquid and Solid, Wet and Dry waste Management, Disposal Vs. Management, Vermicomposting, **4Rs:** Refuse, Reduce, Reuse & Recycle.	05

Suggested Specification table with Marks (Theory) :

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

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

Note : This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books :

1. Smart Village Technology: Concepts and Developments By Srikanta Patnaik, Siddhartha Sen, Magdi S. Mahmoud, Springer International Publishing
2. Smart Villages of Tomorrow: The Road to Mori, Solomon Darwin, Independently Published.
3. Green and Smart Technologies for Smart Cities edited by Pradeep Tomar, Gurjit Kaur, CRC Press, Taylor & Francis Group.
4. IoT and Analytics for Agriculture edited by Prasant Kumar Pattnaik, Raghvendra Kumar, Souvik Pal, S. N. Panda.

Course Outcomes :

Sr. No.	CO statement	Marks % weightage
01	Students will learn about concept and need of Green & Smart Village.	20%
02	Students will know and learn about various technologies to develop smart infrastructures in rural areas.	55%
03	Students will recognize importance of waste management while developing smart village.	25%

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