SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology
Civil Engineering

B. Tech. III Semester VI

Subject Name : Urban Environment and Sustainability **Subject Code:** BTCL14610
Type of course : PEC III
Prerequisite : Environmental Engineering BTCL13503
Rationale : This course focuses on urban environmental issues and assesses the attempts that are being made to develop cities in ways which reduce environmental damage and improve quality of life both now and in the long term so as to achieve environmental sustainability in urban areas.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
3	0	0	3	60	25	15	-	-	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	**Introduction:** Concept of sustainability, goals and objectives of sustainability, Environmental sustainability and its importance, urbanization and its impact, Urban Environment, scenario of sustainability at micro and macro level, approach towards sustainability, Case studies, Eco city, Sustainable city	8	15 %
2	**Urban Environmental Issues and sustainable Urban Planning:** urban heat island, climate change, GHG emission, Socio economics impact, diseases associated with urban environment, wastelands, river pollution impacts of transportation, sustainable transportation: Mass transportation and green fuel, green zone, green building and energy efficient building, ISO 14000, Carbon Footprint, Ecological footprint, Sustainable lifestyle assessment and behavioural modifications at household levels	15	35 %
3	**Urban Air and Noise Pollution, Issues and Management:**Evaluation of ambient air quality, air quality index, vehicular emissions, indoor air quality, odour evaluation and control, Noise Pollution issues, impact of noise, noise control	7	15 %

4	**Urban Water, Wastewater, solid waste Management:** urban water and wastewater management, water conservation techniques, Rain water harvesting, reuse and recycling of water and waste water, zero liquid waste discharge, integrated municipal solid waste management, management of plastic waste, E-waste and Biomedical waste, segregation at waste at source, 5 R's Management, waste to energy, wastelands and its utilization	15	35%

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
15	25	25	20	10	5

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **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 Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Problems & Issues in Urban Environmental Management	Toral Kobawala, Narendra Modi, Hiren Mandalia	LAP Lambert Academic Publishing 978-6200229359	2020	1st
2.	The Urban Heat Island	Iain Stewart Gerald Mills	Elsevier 9780128150177, 9780128156902	2021	1st
3.	Cradle to Cradle: Remaking the Way We Make Things	Michael Braungart	North Point Press ISBN-10: 0865475873	2002	1st
4.	Rainwater Harvesting and Soil Water Conservation Technique	Liliana Lizarraga .	Intelliz Press 1682511456	2016	1st
5.	Catch Water Where It Falls - Toolkit on Urban Rainwater Harvesting	Gita Kavarana, Sushmita Sengupta	Center for Science and Environment 978-81-86906-65-1	2018-	1st
6.	Environmental Carbon Footprints: Industrial case studies	Subramanian Senthilkannan Muthu	Butterworth Heinemann 978-0-12-812849-7	2018	1st
7.	Introduction to E-Waste Management	Lakshmi Raghupathy	TERI 9789386530196	2019	-

8.	Handbook of Electronic Waste Management: International Best Practices and Case studies	Majeti Narasimha Vara Prasad, Meththika Vithanage and Anwesha Borthakur	Butterworth Heinemann 978-0-12-817030-4	2019	1st

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Study basic concept of sustainability and urban environment *(R,U – Cognitive level)*	15
CO-2	Study the urban environmental issues, challenges and management*(R,U, A, N – Cognitive level)*	20
CO-3	Prepare plan and strategies to control and reduce Urban environmental pollution *N, E, C – Cognitive level)*	30
CO-4	Study approaches for waste reduction and reuse of waste as resource*(A, N,E, C – Cognitive level)*	20
CO-5	Interprete resource recovery and conservation*(U, A, E – Cognitive level)*	15

Rationale*: The study of issues of urban environment helps civil engineers to plan for sustainable living in urban areas.

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	2	1	2	1	3	2	3	1	2	2	2	3	2	1	2
CO-2	2	1	2	3	3	2	1	2	2	2	2	1	1	3	1
CO-3	2	3	2	2	2	2	2	1	2	2	2	2	2	1	2
CO-4	1	2	1	3	2	2	1	3	1	2	2	2	2	2	2
CO-5	1	1	1	2	1	3	1	3	1	2	2	2	3	2	1
Rationale *	**8**	**8**	**8**	**11**	**11**	**11**	**8**	**10**	**8**	**10**	**10**	**10**	**10**	**9**	**8**

Rationale*: The study of urban environment, issues associated to it and various methods for its management shall help to develop an insight for achieving urban sustainability

List of Open Source/learning website:
Module 1:Introduction to Sustainable Development:https://www.youtube.com/watch?v=DNUYxyaYh3g
Module 4:Rainwater Harvesting
:https://nptel.ac.in/content/storage2/courses/105101010/downloads/Lecture10.pdf
Module 4:Waste recoveryhttps://nptel.ac.in/courses/120/108/120108005/
Module 4: Waste to Energyhttps://onlinecourses.nptel.ac.in/noc20_ch16/preview

PEC III: Professional Elective Course III