GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3173522

Semester – VII
Subject Name: SUSTAINABLE DEVELOPMENT AND GREEN TECHNOLOHGY

Type of course: Professional Elective Course

Prerequisite: Basic Concepts regarding nanotechnology and some basic knowledge of sustainability.

Rationale: This subject introduces concepts of nanotechnology and different techniques to achieve sustainability.

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	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1.	Nanotechnology in Environmental Applications, Green Synthesis of Ecofriendly Nanoparticles and Their Applications, Role of Phytoremediation in Maintaining Environmental Sustainability, Microbial fuel cell (MFC) technology, Biodegradable polymers	10
2.	Green technology for sustainable agriculture : agricultural productivity, need of green Technology, Fertilizers Use and Deterioration of Soil Environment, Organic Manures: A Boon for Soil Health, The role of phytoremediation in maintaining environmental sustainability, Biofuels for Sustainable Development, Six steps methodology for CP, Concept of Cleaner Production	10
3.	Sustainable Development : Principles of sustainable developments, waste prevention and minimization of waste generation, The Sustainability Issue , Sustainabilty goals, Objectives of Sustainable Development	08
4.	Recycling & Reuse: Concept and application, Recycling and reuse of liquid industrial waste in different industries	08

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
21	**14**	**16**	**11**	**8**	**0**

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.

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Reference Reference Books:

1) An Introduction to Green Chemistry Matlack A.S., Marcel Dekker, 2001
3) Cleaner Production and its implementation in Industries , Dr Bharat Jain, GCPC
4) NCPC manual
5) Environmental Sustainability Using Green Technologies,By V. Sivasubramanian
6) Green Technologies and Environmental Sustainability,Editors: Singh, Ritu, Kumar, Sanjeev
7) Green Technology : SS Purohit

Note: Apart from above references one can use some other books and material if required.

Course Outcomes: After learning this course students will be able to

Sr No	CO Statement	Marks Weightage%
CO-1	Understand and choose the different principles of sustainable development for various applications	15
CO-2	Explain the concepts of Cleaner Technologies.	20
CO-3	Define reuse and recycle	15
CO-4	Construct Sound knowledge of nano technology and its various applications	15
CO-5	Assess CP Methodology.	15
CO-6	Evaluate Classification of Green Productivity and emerging technology	20

List of experiments

1. Atom economical reactions
2. Acetylation of primary Amine.
3. Base catalyzed aldol condensation.
4. Halogen addition to C=C bond.
5. [4+2] Cycloaddition Reaction.
6. Green Photochemical Reaction.

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