



# Shri Vaishnav Vidyapeeth Vishwavidyalaya

## Shri Vaishnav Institute of Science

### Department of Chemistry

#### Generic Elective Course

#### Choice Based Credit System (CBCS)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
GPCH104	PG	Environmental Issues and Applications of Green Chemistry	3	0	0	3	60	20	20	0	0

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

**\*Teacher Assessment shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.**

#### Course Objectives: -

- To give basic knowledge Environmental Issues
- To understand and apply the knowledge of Green Chemistry.

#### Course Outcomes: -

After completion of this course the students are expected to be able to demonstrate following knowledge, skills, and attitudes. The student will demonstrate capability of

CO1. Theoretical understanding of Environmental Issues

CO2. Became aware of the importance of Applications of Green Chemistry.

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#### UNIT I:

##### **A. Air Pollution:**

Definition and sources of pollution; Different types of pollution and their global, regional and local aspects. Types and sources of air pollutants; Reaction of pollutants in air forming smog, PAN, Acid rain; Atmospheric diffusion.

##### **B. Water Pollution:**

Sources of water and their contamination; Types of pollutants, various industrial effluents such as pulp and paper mills, oil exploration and refinery, petrochemicals, iron and steel industries, domestic wastes

#### UNIT II: Soil pollution

Causes of soil pollution, Effects of Fungicides and weedicides on soil components, residual toxicity, and pollution. Different kinds of synthetic fertilizer (N, P, K), and their interactions with different components of soil, their toxicity and pollution

#### UNIT III

E-waste sources of generation, Effects and Control measures, Global Strategy. Project on E-waste handling.

#### Unit-IV:

Overview, Principle, concepts, and Tools of Green Chemistry: Overview of green chemistry, Chemistry of the atmosphere, principles of sustainable and green chemistry. Basic principles of green technology, concepts of atom economy and carbon trading, tools of green technology.

#### Unit-V:

##### **A: Green Chemistry applications I:**

Biocatalysis, green chemistry in industries, fuel cell and electric vehicles, solar energy and hydrogen production.

##### **B. Green technology applications II:**

Biofuel production (bio-ethanol and biodiesel), Biomass, prevention/minimization of hazardous/toxic products. Agricultural related practices and food processing.

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**Recommended Texts:**

1. M.H.Fulekar (2005) Environmental Biotechnology Oxford IBH Publishing cooperation.
2. M.H.Fulekar (2010) Bioremediation technology recent advances, springer
- 3 Lynn Goldman, Christine Coussens, Implications of nanotechnology for environmental health research, National Academic Press, Washington, 2007
4. Matlack, A. S. Introduction to Green Chemistry. Marcel Dekker: New York, 2001

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