Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Science
Department of Chemistry
Generic Elective Courses
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*
GUCH503	UG	Industrial Chemicals and Environment	3	0	0	3	60	20	20	00	00

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST -Mid Sem Test.
***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/ Participation in class, given that no component shall exceed more than 10 marks.

Course Objective:

- To give basic knowledge to make students aware of the concepts of different gases and their industrial production, uses, storage, and hazards.
- To promote the preparation of Ultra-Pure metals for semiconducting technology
- Aware of Air and Water pollution, and control measures for Air and Water Pollutants.
- To develop an understanding of Catalyst and Biocatalyst, Energy and Environment.

Course Outcomes

After completion of the course, the students will be able to understand:

- The different toxic gases and their toxicity hazards.
- Safe design systems for large-scale production of industrial gases.
- The requirement of ultra-pure metals for semiconducting technologies.
- Different industrial effluents and their treatment methods.

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Unit-I Industrial Gases:
Large-scale production uses storage and hazards in handling of the following gases: oxygen, nitrogen, hydrogen, carbon monoxide, chlorine, fluorine, and sulfur dioxide.

Inorganic Chemicals: Manufacture, applications, analysis, and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulfuric acid, caustic soda, bleaching powder, and potassium permanganate.

Unit-II: Industrial Metallurgy:
Preparation of ultrapure metals for semiconductor technology.

Unit-III: Environmental Segments:
Ecosystems. Biogeochemical cycles of carbon, nitrogen, and sulfur.
Air pollutants: types, sources, particle size, and chemical nature; Photochemical smog. Major sources of air pollution, Effects of air pollution on living organisms and vegetation.

Unit-IV: Water Pollution:
Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological cycle and ecosystems. Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, agro fertilizers. Water quality parameters for wastewater, industrial water, and domestic water

Unit-V: Energy & Environment:
Sources of energy: coal, petrol, and natural gas. Nuclear fusion/fission, solar, hydrogen, geothermal, tidal and hydel. Atomic Pollution: Disposal of nuclear waste, nuclear disaster, and its management.

Reference Books:
1. Manahan, S.E. (2017), Environmental Chemistry, CRC Press

2. Buchel, K.H.; Moretto, H.H.; Woditsch, P.(2003), Industrial Inorganic Chemistry, Wiley-VCH.

3. De, A.K. (2012), Environmental Chemistry, New Age International Pvt., Ltd.

4. Khopkar, S.M. (2010), Environmental Pollution Analysis, New Age International Publisher.

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