Pandit Deendayal Energy University   B. Tech. Petrochemical Engineering/DPE/SoET

22PCM407T					Pollution Control in Petrochemical Industries					
Teaching Scheme					**Examination Scheme**					
L	**T**	**P**	**C**	**Hours/Week**	**Theory**			**Practical**		**Total Marks**
					MS	**ES**	**IA**	**LW**	**LE/Viva**	
2	0	0	2	2	25	50	25	--	--	100

COURSE OBJECTIVES:

➢ Characterization and classification of different types of wastes are discussed along with existing norms for waste disposal.
➢ Treatment methods of specific pollutant arising out of industrial process are explained.
➢ Introduces various concepts of water efficiency and waste minimization in industrial sectors.

UNIT I: Introduction   **6 Hr.**

Biosphere, Hydrological cycle, Nutrient cycle, Consequences of population growth, Pollution of air, Water and soil. Air pollution sources and effects: Classification and properties of air pollutants, Emission sources, Behaviour and fate of air pollutants, Effect of air pollution.

Unit II: Aspects of Air Pollutant Dispersion   **7 Hr.**

Temperature lapse rates and stability, Wind velocity and turbulence, Plume behaviour, Dispersion of air pollutants, Estimation of plume rise. Air pollution sampling and measurement: Types of pollutant sampling and measurement, ambient air sampling, Stack sampling, Analysis of air pollutants.

UNIT III: Control of specific gaseous pollutants   **6 Hr.**

Control of sulphur dioxide emissions, Control of nitrogen oxides, Carbon monoxide control, Control of hydrocarbons and mobile sources. Water pollution: Water resources, Origin of wastewater, types of water pollutants and their effects.

UNIT IV: Waste water sampling analysis and treatment   **7 Hr.**

Sampling, Methods of analysis, Determination of organic matter, Determination of inorganic substances, Physical characteristics, Bacteriological measurement, Basic processes of water treatment, Primary treatment, Secondary treatment, advanced wastewater treatment, Recovery of materials from process effluents.

                                                                    Max. 26 Hr.

COURSE OUTCOMES
On completion of the course, students will be able to,

CO1: Understand the different types of industrial pollution.
CO2: Realize the environmental impact of industrial pollution.
CO3: Analyse an industrial activity and identify the environmental problems.
CO4: Plan the strategies to control and reduce pollution.
CO5: Select the most appropriate technique to control and treat industrial pollution.
CO6: Analyse the characteristics of pollution.

TEXT/ REFERENCE BOOKS:

1. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G. Environmental Engineering, McGraw Hill International, 1985.
2. Metcalf & Eddy, Wastewater Engineering, Tata McGraw-Hill Education Private Limited, 2009.
3. Masters, G.M., Introduction to Environmental Engineering and Science, Prentice Hall off India, 2008.
4. Rao, C.S., Environmental Pollution Control Engineering, Wiley Eastern, 2010.
5. De Nevers, N., Air Pollution Control Engineering, McGraw-Hill, 2000.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100	**Exam Duration: 3 Hr.**
Part A: 10 Questions each carrying 5 marks	50 Marks
Part B: 5 Questions each carrying 10 marks	50 Marks