

Course code	Course Name	L-T-P-Credits	Year of Introduction
CH374	PROCESS DESIGN FOR POLLUTION CONTROL	3-0-0-3	2016
Prerequisite : CH301 Environmental engineering			
Course Objectives:			
<ul style="list-style-type: none"> To impart knowledge in various pollution prevention and control techniques 			
Syllabus			
Environmental regulations, definition of pollutant, types of pollution, process design of water pollution control equipments, process design of water pollution control equipments, process design of air pollution control equipments, bio medical waste			
Expected Outcome			
The students will be able to			
<ol style="list-style-type: none"> understand the importance of protection and improvement of the environment to monitor and design air ,water& biomedical pollution control systems to select and use suitable waste treatment technique 			
Text Books			
<ol style="list-style-type: none"> Freeman.H.M, "Industrial Pollution Prevention Hand Book", McGraw Hill,1995 Ray T.K., " Air Pollution Control in Industries", Volume I, TBI, New Delhi 			
Reference Books			
<ol style="list-style-type: none"> C S Rao, Environmental Pollution Control Engineering, New age International C. C. Lee, Shun Dar Lin, Handbook of Environmental Engineering Calculations, Second Edition, McGraw Hill S.P.Mahajan Pollution Control in process industries, Tata McGraw Hill, 1990 Connwell & Devis, Introduction to Environmental Engineering, TMH. Frank R. Spellman, Handbook of Water and Wastewater Treatment Plant Operations, CRC Press Metcalf & Eddy, Wastewater Engg. TMH S.J.Arceivala, Wastewater treatment for pollution control, TMH 			
Course Plan			
Module	Contents	Hours	Sem. exam marks
I	Prevention vs control of industrial pollution, Environment policies and Regulations to encourage pollution prevention, Environment friendly chemical processes, Regulations for clean environment and implications for industries	7	15%
II	Definition of pollutant, types of pollution; Air, Water, Land, noise- adverse effects of pollutants eco system and human health - need for effluent treatment and toxicity, control. Water standards for portable, agricultural and left-off streams- air standards for cities, industrial areas, resorts.	8	15%
FIRST INTERNAL EXAMINATION			
III	Design of Equalization Tank, Sedimentation tank, Oil and grease removal unit, aerator and settling tank of an Activated sludge process, Trickling filter, secondary clarifier, Design of Rotating Biological Contactor.	8	20%
IV	Design of Oxidation pond and Oxidation Ditch, Anaerobic	8	20%

	Filter, Two step Anaerobic Digestion System, Design of Sludge Digester and Sludge Thickener, Air stripping tower		
SECOND INTERNAL EXAMINATION			
V	Process design of cyclone separators, fabric filters and Electrostatic precipitators, Baghouses, gravity settler, SO ₂ Scrubbers.	6	15%
VI	Characterization of medical waste- Bio-medical wastes, biomedical waste categories. Environmental pollution, Treatment methods. Process design of Incinerator, Microwave.	5	15%
END SEMESTER EXAMINATION			

Question Paper Pattern

Maximum Marks: 100

Exam Duration: 3 Hours

Part A : There shall be **Three questions** uniformly covering Modules 1 and 2, each carrying 15 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in each main question with a total of 15 marks for all the subdivisions put together. (2 x15= 30 Marks)

Part B: There shall be **Three questions** uniformly covering Modules 3 and 4, each carrying 20 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in each main question with a total of 20 marks for all the subdivisions put together. (2 x20= 40 Marks)

Part C: There shall be **Three questions** uniformly covering Modules 5 and 6, each carrying 15 marks, of which the student has to answer any **Two questions**. At the most 4 subdivisions can be there in each main question with a total of 15 marks for all the subdivisions put together. (2 x15= 30 Marks)