GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology		Branch/Spec.	Civil Engineering	
Semester	VII		Version	2.0.0.0	
Effective from Academic Year	2016-17		Effective for the batch Admitted in	2014-15	
Subject code	2CI715	Subject Name	**Elective Paper – I (Environment Pollution & Control – I)**		

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3		1		4	Theory	40	60	100
Hours	3		2		5	Practical	35	15	50

Pre-requisites:

ENVIRONMENT ENGINEERING-I & II

Learning Outcome:

Students will learn about the Basic Chemistry and Microbiology of the Water and Waste Water. They also understand the different advance techniques of environment Engineering Laboratory. Also this subject content with the industrial waste Water treatment.

Theory syllabus

Unit	Content	Hrs
1	**Physicochemical Treatment Process:** Theory, principles and types of aeration and gas transfer. Gas stripping, filtration through porous media, softening, disinfection, desalination, ion exchange, adsorption, membrane processes, electro dialysis, tertiary treatments of wastewater. physicochemical removal of dissolved organics, nutrient stripping, sludge dewatering and disposal, miscellaneous treatments like deflouridation etc.	10
2	**Industrial Water and Wastewater:** Water quality requirement for various industries, relevant IS standards and their significance. Composition and characteristics of following industrial wastewaters: Textile, dairy, food and fruit processing, brewery, pulp and paper mill, steel mill, fertilizer manufacturing unit, petrochemical, refinery, thermal power plants.	10
3	**Instrumental Methods of Analysis:** Advance instrumental methods of analysis, turbidity meter, colorimeter, spectrophotometer, flame photometer, AAS, Polaro graph, chromatograph, etc. principles, calibration, range and applicability.	8
4	**Environmental Chemistry:**	5

	General chemistry, oxidation reduction equations in wastewater treatment, chemical precipitation, common ion effect, ion exchange chemistry.	
5	**Environmental Microbiology:** Microbial growth & food requirements, various types & classification of microbes, microbiology of water & sewage, microbiology of milk, Environmental & Industrial microbiology, microbiology of air, Aquatic microbiology.	6

Practical content
Term work shall be based on laboratory experimental work, tutorials, detailed designs of appropriate units and shall include a seminar.

Text Books	
1	Environmental Chemistry By Sawyer & McCarty
2	Physicochemical Treatment BY Weber & Weber

Reference Books	
1	Industrial Wastewater Treatment By Eckenfelder
2	Wastewater Treatment By Metcalf & Eddy