University of Kerala

Discipline	CHEMISTRY				
Course Code	**UK3DSECHE200**				
Course Title	**ENVIRONMENTAL CHEMISTRY I**				
Type of Course	**DSE**				
Semester	3				
Academic Level	200 - 299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical Per week	Total Hours/Week
	4	4 hours	-		4
Pre-requisites	1. Fundamental concept of Environmental Chemistry 2. Terminology associated with Environment				
Course Summary	This course provides students with the knowledge of ecosystem and the different types of pollution caused by human activities. This course enlightens the students about the need to protect and conserve our environment for future generation. The course also highlights the green protocols and methodology being adopted for preserving the Environment.				

Detailed Syllabus:

Module	Unit	Content	Hours
		ENVIRONMENTAL CHEMISTRY I	
I	**ENVIRONMENT AND ITS COMPONENTS**		**9**
	1	Introduction, concepts and scope of environmental chemistry	2
	2	components of environment – biotic, abiotic and energy components	1
	3	Environmental segments- atmosphere, hydrosphere, lithosphere and biosphere-Structure and its composition	3
	4	General Concepts of biological cycles – carbon cycle, nitrogen cycle, and oxygen cycle	2
	5	Environmental perspectives, environment and society	1
II	**ECOLOGY AND ECOSYSTEM**		**9**
	6	Ecology-elementary idea. Food chain- grazer and detritus food chain. Food web. Ecological pyramid.	3
	7	Ecosystem- concept, components, function and classification	2
	8	Productivity in an ecosystem- primary and secondary productivity	1
	9	Biodiversity, sustainable ecosystem.	1
	10	Population and environment: Human population and distribution, urbanization	2
III	**RESOURCES-TYPES AND CLASSIFICATION**		**9**

	11	Natural Resources-classification, Water resources, Forest resources, Land resources, Mineral resources, Energy resources	2
	12	Renewable and non-Renewable energy resources. Renewable energy resources - bio fuel & biomass energy, hydro power, Solar energy Wave energy and Tidal Energy-Mention only	3
	13	Nonrenewable energy resources - nuclear fuels and fossil fuels	1
	14	Hydrogen as a next generation fuel	1
	15	Conservation of natural resources. Future energy resources. Sustainable use of resources	2
IV	**ENVIRONMENTAL POLLUTION, ETHICS AND LAWS**		**18**
	16	Pollution- definition and its classification. Pollutants, classification of pollutants based on source and physical state	4
	17	Causes, effect and control measures of thermal pollution, nuclear pollution, marine pollution and Industrial pollution- Cement, sugar, paper industry, thermal and nuclear power plants	5
	18	Environmental laws-Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Rio declaration, Montreal protocol, Kyoto Protocol-Principles	4
	19	Environmental ethics: Issues and possible solutions	1
	20	Environmental audit -Types Environmental management-objectives and components.	4
V	**OPEN ENDED MODULE: Learning through problem solving, seminars, open discussions, assignment discussions, Quizzes, Open book exams etc**		**15**
	21	Introduction to Environmental Components and segments	
	22	Concept of biological cycles and Food chain	
	23	Classification of Natural Energy Resources and its conservation	
	24	Classification of Pollutants and Types of Pollution	
	25	Introduction to environmental laws and legislation	

References

1 *Introduction to Environmental Chemistry*, Seventh Edition, New Age International Publishers
2 Gray W. van Loon & Stephen J. Duffy, *Environmental Chemistry*: A Global Perspective, Oxford University Press
3 H. Kaur, *Environmental Chemistry*, Pragati Prakashan
4 V.K Ahluwalia, *Environmental Chemistry*, Second Edition, Ane Books Pvt. Ltd.
5 Ronald A. Bailey, Herbert M. Clark, James P. Ferris, Sonja Krause, Robert L. Strong, *Chemistry of the Environment*, Second Edition, Academic Press
6 Asim K. Das, *Environmental Chemistry with Green Chemistry*, Books and Allied (P) Ltd.
7 G S Sodhi, *Fundamentals Environmental Chemistry*, Second Edition, Narosa Publishing House.