

22CY201	ENVIRONMENTAL SCIENCE AND ENGINEERING			Semester		II		
PREREQUISITES			Category	BS	Credit	3		
NIL			Hours/Week	L	T	P	TH	
				3	0	0	3	
Course Learning Objectives								
1	Principles of environmental resources.							
2	Preservation of ecosystem and biodiversity.							
3	Principles of environmental threats and pollution.							
4	Principles of solid waste management.							
5	Environmental issues and ethics.							
Unit I		ENVIRONMENTAL RESOURCES			9	0	0	9
Forest resources – importance, deforestation – water resources – sources - hydrological cycle - Food resources – effects of modern agriculture, fertilizers, and pesticides – Mineral resources – types – mining – environmental effects of extracting and using mineral resources – Land resources – land degradation – soil erosion.								
Unit II		ECOSYSTEM AND BIODIVERSITY			9	0	0	9
Environment – biotic and abiotic components – ecosystem components food chain and food web, tropic levels – energy flow in ecosystem, ecological pyramids – ecological succession, types – Biodiversity- types, values of biodiversity, hot spots of biodiversity, threat to biodiversity, endangered and endemic species, conservation of biodiversity – IN-situ and Ex-situ conservation.								
Unit III		ENVIRONMENTAL POLLUTION			9	0	0	9
Air pollution – classification of air pollutants gaseous, particulates – sources, effects and control of gaseous pollutants, SO ₂ , NO ₂ , H ₂ S, CO and particulates – control methods – cyclone separator, electrostatic precipitator, catalytic convertor – Water pollution – heavy metal ions pollutants – organic pollutants, oxygen demanding waste, aerobic and anaerobic decomposition BOD and COD – experimental determination of BOD only – treatment of domestic and industrial wastewater – Noise pollution – decibel scale – sources, effects and control measures.								
Unit IV		ENVIRONMENTAL THREATS AND SOLID WASTE MANAGEMENT			9	0	0	9
Acid rain, greenhouse effect and global warming, ozone depletion, photo chemical smog, eutrophication, bio-amplification – disaster management – origin, effects and management of earthquake and floods. Solid waste management – solid wastes classification, origin, effects – treatment methods – 3R approach - composting, sanitary land filling – destructive methods – incineration, pyrolysis.								
Unit V		SOCIAL ISSUES AND ENVIRONMENTAL ETHICS			9	0	0	9
From unsustainable to sustainable development - aim and ways of achieving – urban problems related to energy – water conservation and management- rain water harvesting – waste land reclamation – consumerism – human population – population growth – characteristics of population growth – variation of population among nations and based on age structure – population explosion - reason, effects and remedy – family welfare program , family planning program – HIV and AIDS.								
Total = 45 Periods								

Text Books:	
1	Elements of Environmental science and Engineering, P.Meenakshi, Prenitce — Hall of India, New Delhi, 2009.

2	A Textbook of Environmental Chemistry and Pollution Control: (With Energy, Ecology, Ethics and Society), Revised Edition, Dr. S.S. Dara, D.D. Mishra Published by S. Chand & Company Ltd, 20 14.
Reference Books:	
1	Introduction to Environmental Engineering and Science, Gilbert M. Masters; Wendell P. El a Publisher: Prentice-Hall India, 3rd Edition, 2008.
2	Environmental Science, F; Idren D. Enger, Bredley F. Smith, WCD McGraw Hill 14" Edition 2015.
E-References	
1	www.onlinecourses.nptel.ac.in/
2	www.ePathshala.nic.in

COURSE ARTICULATION MATRIX