Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program	**B.A. / B.Sc. (LIBERAL EDUCATION)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Environmental Pollution, Monitoring and Control**	**Course Code:**	**EVA201**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**40 Marks**		**End Term Exam:**	**35 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	1. Understand environmental problems and establish a clear link between pollution sources, exposure pathway and impact on environment and human health. 2. Increase knowledge on various approaches facilitating mitigation of environmental challenges. 3. Learn methods to analyze and manage the environmental pollution.				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	**Attributes**
CO1	Identify the potential air pollutants, source of emission, and impact of deteriorated air quality on human and ecosystem, and practical approach for its mitigation.
CO2	Learn how human activities cause water pollution, resulting in disruption of ecosystems and know about pollution monitoring and control.
CO3	Understand how daily activities impact soil quality and cause solid waste generation, leading to food insecurity and contamination of environment. Students also learn approaches to manage solid waste generation and safe disposal.
CO4	Students learn about sources and effect of noise and radioactivity exposure, and evaluate the need to limit dependency on sources leading to noise and radioactivity pollution.
Pedagogy	Interactive, discussion-based, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 20 Marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Air pollution and its control** ● Air Pollution: Sources, causes, effects, and control ● Principal air pollutants: Particulate Matter (PM_{10} and $PM_{2.5}$), CO_2, CO, NOx, SOx, aerosols and methane ● Smog, greenhouse effect, ozone layer depletion, & acid rain ● Ambient air quality: Monitoring and standards, Air Quality Index (AQI) and control measures. ● Case study: War and air quality in Ukraine	15	CO1

Unit 2	**Water pollution and its control** ● Water pollution: Sources, causes, effects, and control ● Eutrophication and algal growth ● Case study: Minamata disease, pacific garbage patch ● Water quality monitoring: Water quality parameters and standards; ● Water and wastewater treatment	15	CO2
Unit 3	**Soil pollution and solid waste management** ● Soil pollution: sources, causes, effects, and control measures ● Case study: DDT and Birds ● Solid waste, types and pollution; case study-Love canal tragedy ● Solid Waste management ● Methods of solid waste disposal	15	CO3
Unit 4	**Noise and radioactive pollution** ● Noise pollution: Source, effects and control measures ● Noise exposure level; Permissible ambient noise levels ● Radioactive Pollution: Types, sources and effects of radiation ● Case study: Chernobyl nuclear disaster	15	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	3	1	2	2		3		3	3	3	
CO2	3	2	3	3	1	2	2		3		3	3	3	
CO3	3	2	3	3	1	2	2		3		3	3	3	
CO4	3	2	3	3	1	2	2		3		3	3	3	

Strongcontribution-3,Averagecontribution-2, Lowcontribution-1,

Suggested Readings:

Text- Books

1. Purohit, S.S. & Ranjan, R. 2007. Ecology, Environment & Pollution. Agrobios Publications.
2. Dara, S. S., A text book of environmental chemistry and pollution control, S. Chand & Company Ltd, New Delhi.

Reference Books

1. Hester, R.E. & Harrison, R.M. 1998. Air Pollution and Health. The Royal Society of Chemistry, UK.
2. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2006. Environmental and Pollution Science. Elsevier Academic Press.
3. Principles of Environmental Chemistry, 3rd edition, J. E. Girard, Jones & Bartlett Learning, Company, Burlington.

Para Text

Unit 1:

1. AQI-https://www.youtube.com/watch?v=xm76nqGIhDY&ab_channel=DecodeTrend

Unit 2:

1. Water Quality standards in India- https://cpcb.nic.in/wqm/BIS_Drinking_Water_Specification.pdf
2. Concept and working of ETP- Waste treatment https://www.youtube.com/watch?v=s8IVjQg7yno

Unit 3:

1. Vermicompost- https://www.youtube.com/watch?v=mGxfzR_Rx7E&ab_channel=EPC_MasterGardeners

Unit4:

1. **Chernobyl disaster: radioactive pollution-** https://www.youtube.com/watch?v=J8F1aMkxpIk

Recapitulation & Examination Pattern		
Internal Continuous Assessment:		
Component	**Marks**	**Pattern**
Mid-term Exam	20	**Section A:** Contains **10** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **0.5 marks.** **Section B:** Contains **07** descriptive questions out of which **05** questions are to be attempted. Each question carries **03 marks**.
Class Test	05	Contains **05 descriptive questions.** Each question carries **01** marks.
Online Test/ Objective Test	05	Contains **10 multiple choice questions.** Each question carries **0.5** marks.
Assignment/ Presentation	05	Assignment to be made on topics and instruction given by subject teacher.
Attendance	05	As per policy.
Total Marks	**40**	

Course created by: Dr. Swati Sachdev **Signature:**	**Approved by: Prof. Venkatesh Dutta** **Signature:**