**Activity Plan 2024-2025**

* Field visit to some of the ecosystems found in Delhi like Delhi Ridge/ Sanjay lake/ Yamuna river and its floodplains etc., or any nearby lake or pond, explaining the theoretical aspects taught in the classroom.
* Visit any biodiversity park/ reserve forest/ protected area/ zoo/ nursery/ natural history museum in and around Delhi, such as Okhla bird sanctuary/ Asola Bhatti Wildlife Sanctuary/ Yamuna Biodiversity Park/ Sultanpur National Park, explaining the theoretical aspects taught in the classroom. (25th September)
* Visit to a local polluted site (urban/rural/industrial/agricultural), wastewater treatment plants, or landfill sites, etc (Documentary film).
* Webinar/ workshop/ group discussion on relevant topics for enhancing awareness, capacity building, and critical reasoning among students.
* Basic exercise to Calculate and Assess carbon footprint.
* Powerpoint presentation of students on important environmental issues.
* Poster/Collage making.
* Plantation, biocomposting.
* Project Report on local environmental issues.

**CURRICULUM PLAN**

**(Semester I, 2024-25)**

**Name-** Dr. Sunaina

**Subject**- Environmental Sciences (AEC) ( 01 Theory and 02 hours Practical)

|  |  |  |
| --- | --- | --- |
| **Days** | **Units covered/To be covered** | **Topics covered/To be covered** |
| 29/08/2024-20/09/24  (3 weeks) | Introduction to Environmental Studies | Multidisciplinary nature of environmental studies; Components of environment: atmosphere, hydrosphere, lithosphere, and biosphere. Scope and Importance; Concept of sustainability and sustainable development; Brief history of environmentalism |
| 21/09/2024-20/10/2024  (4 weeks) | Ecosystems | Definition and concept of Ecosystem; Structure of ecosystem (biotic and abiotic components). Functions of Ecosystem: Physical (energy flow), Biological (food chains, food web, ecological succession), and Biogeochemical (nutrient cycling) processes. Concepts of productivity, ecological pyramids and homeostasis Types of Ecosystems: Tundra, Forest, Grassland, Desert, Aquatic (ponds, streams, lakes, rivers, oceans, estuaries). Importance and threats with relevant examples from India; Ecosystem services (Provisioning, Regulating, Cultural, and Supporting). Ecosystem preservation and conservation strategies; Basics of Ecosystem restoration |
| 21/10/2024-26/11/2024  (5-6 weeks) | Natural Resources | Land Resources: Minerals, soil, agricultural crops, natural forest products, medicinal plants, and forest-based industries and livelihoods; Land cover, land use change, land degradation, soil erosion, and desertification; Causes of deforestation; Impacts of mining and dam building on environment, forests, biodiversity, and tribal communities. Water Resources: Natural and man-made sources of water; Uses of water; Over exploitation of surface and ground water resources; Floods, droughts, and international & inter-state conflicts over water. Energy Resources: Renewable and non-renewable energy sources; Use of alternate energy sources; Growing energy needs; Energy contents of coal, petroleum, natural gas and biogas; Agro-residues as a biomass energy source. Case studies: Contemporary Indian issues related to mining, dams, forests, energy, etc (e.g., National Solar Mission, Cauvery River water conflict, Sardar Sarovar dam, Chipko movement, Appiko movement, Tarun Bharat Sangh, etc). |
| 27/11/2024-24/12/2024  (4 weeks) | Environmental pollution | Environmental pollution (Air, water, soil, thermal, and noise): causes, effects, and controls; Primary and secondary air pollutants. Air and water quality standards; Nuclear hazards and human health risks. Solid waste management: Control measures for various types of urban, industrial waste, Hazardous waste, E-waste, etc; Waste segregation and disposal. Pollution case studies: Ganga Action plan (GAP), Delhi air pollution and public health issues, Plastic waste management rules, Bhopal gas tragedy, etc. |
| 29/08/2024- 24/12/2024 | Practicals | **Unit 1**  1. Analysis of achievement of Sustainable Development Goals of any country.  2. Gain insights of sustainability framework for an industrial activity using activity worksheets.  **Unit 2**  1. Schematic collection of data for depicting ecological pyramids in the College campus  2. Differentiation of natural and managed ecosystems using Google Earth/Google Map  3. Field visit to terrestrial and aquatic ecosystems (forests, grasslands, wetlands, biodiversity parks, etc.)  4. Develop a working model of any ecosystem.  **Unit 3**  1. Visit to a paper recycling unit/rainwater harvesting plant/solar plant in the College campus  2. Develop and understand working model of renewable/non-renewable sources of energy  3. Mapping of natural resources of a given study area using Google Earth and Time-series analysis of natural resource consumption of a given country using publicly available data  **Unit 4**  1. Determine water quality of a given location using rapid pollution monitoring kits. & Identify suitability of given water samples for various purposes using given kits  2. Assess air quality index (AQI) of any location using real-time air quality parameters  3. Determine magnitude of solid waste generated in a home/college on a monthly basis & Develop and maintain compost/vermicompost using biodegradable waste in the College  4. Prepare a water audit report of the college/house/locality/colony and Map solid and liquid discharge of the college/colony and develop a management plan (show it using schematic diagram, and photographs. |

**CURRICULUM PLAN**

**(Semester III, 2024-25)**

**Name-** Dr. Sunaina

**Subject**- Environmental Sciences (AEC) ( 01 Theory and 02 hours Practical)

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| **Days** | **Units covered/To be covered** | **Topics covered/To be covered** |
| 01/08/2024-08/09/24  (5-6 weeks) | Global Environmental issues and Policies | Causes of Climate change, Global warming, Ozone layer depletion, and Acid rain; Impacts on human communities, biodiversity, global economy, and agriculture. International agreements and programmes: Earth Summit, UNFCCC, Montreal and Kyoto protocols, Convention on Biological Diversity (CBD), Ramsar convention, The Chemical Weapons Convention (CWC), UNEP, CITES, etc. Sustainable Development Goals: India’s National Action Plan on Climate Change and its major missions. Environment legislation in India: Wildlife Protection Act, 1972; Water (Prevention and Control of Pollution) Act, 1974; Forest (Conservation) Act 1980; Air (Prevention & Control of Pollution) Act, 1981; Environment Protection Act, 1986; Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. |
| 21/09/2024-20/10/2024  (5-7 weeks) | Biodiversity and Conservation | Definition of Biodiversity; Levels of biological diversity: genetic, species and ecosystem diversity; India as a mega- biodiversity nation; Biogeographic zones of India; Biodiversity hotspots. Endemic and endangered species of India; IUCN Red list criteria and categories; Value of biodiversity: Ecological, economic, social, ethical, aesthetic, and informational values of biodiversity with examples; sacred groves and their importance with examples. Threats to biodiversity: Habitat loss, degradation, and fragmentation; Poaching of wildlife; Man-wildlife conflicts; Biological invasion with emphasis on Indian biodiversity; Current mass extinction crisis. Biodiversity conservation strategies: in-situ and ex-situ methods of conservation; National Parks, Wildlife Sanctuaries, and Biosphere reserves; Keystone, Flagship, Umbrella, and Indicator species; Species reintroduction and translocation. Case studies: Contemporary Indian wildlife and biodiversity issues, movements, and projects (e.g., Project Tiger, Project Elephant, Vulture breeding program, Project Great Indian Bustard, Crocodile conservation project, Silent Valley movement, Save Western Ghats movement, etc) |
| 28/10/2024-28/11/2024  (5-6 weeks) | Human communities and the Environment | Human population growth: Impacts on environment, human health, and welfare; Carbon foot-print; Resettlement and rehabilitation of developmental project affected persons and communities; relevant case studies; Environmental movements: Chipko movement, Appiko movement, Silent valley movement, Bishnois of Rajasthan, Narmada Bachao Andolan, etc; Environmental justice: National Green Tribunal and its importance Environmental philosophy: Environmental ethics; Role of various religions and cultural practices in environmental conservation Environmental communication and public awareness: case studies (e.g., CNG vehicles in Delhi, Swachh Bharat Abhiyan, National Environment Awareness Campaign (NEAC), National Green Corps (NGC) “Eco-club” programme, etc). |
| 01/08/2024- 28/11/2024 | Practicals | **Unit 5**  1. Depict temperature/precipitation trend of a given study area using online data  2. Formulate questionnaire/online surveys for assessment of the impact of climate change on people  3. Assess Nationally Determined Contributions (NDCs) of developed and developing countries  4. Development and simulation of Moot Court for Mock Trials in Negotiation Green Tribunal  5. Identify the carbon footprint of your college. (refer vvvvf@envis.nic.in).  6. Analyze the status of at least 3 sustainable development goals in your neighborhood and write a proposal to help achieve them at global standard (identify environmental problems and its social and economic impact, define objectives, explain methodology, budgetary requirements, and suggest the expected outcome). A PowerPoint presentation to be made based on the project proposal.  **Unit 6**  1. Acquaintance with open-source databases of biodiversity  2. Determine species location in a given study area  3. Depict distribution of biodiversity across latitude and altitude  4. Show species distribution across space and time  5. Quantify species loss across different time periods  6. Sampling of plant and animal biodiversity of the College campus  7. Identification of the floral diversity of Delhi and other states. Documentation of the plants by clicking pictures, finding out the scientific names/ local names through literature or mobile applications, identification of their conservation status (IUCN red book list), medicinal properties, water consumption status, and socio-economic-environmental importance. A short report to be submitted) (Virtual Tour)  8. Exercise to understand the socio-economic-environmental impact of wildlife conservation. (Students can choose any global animal species and identify the relevance of the species for the ecosystem/ society/ culture/ local economy, historic or present range of the species, emerging threats due to human activities, identification of documented events of natural disasters/ conflicts/ poaching of the species in the present range, conservation status (WON red book list), identification of protected areas/ programs of the government/ international organization, and their opinion to further improve the conservations of the species. A short report to be submitted.  **Unit 7**  1. Visit to marginalized localities and students for environmental education and environmental awareness.  2. Formulation of questionnaire/online surveys for assessment of the impact of environmental education  3. Visit to any developmental project affected locality for assessing the impacts of economic development on human lives. |

**CURRICULUM PLAN**

**(Semester I, 2024-25)**

**Name-** Dr. Akansha Rai

**Subject**- Environmental Sciences (AEC) ( 01 Theory and 02 hours Practical)

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| **Days** | **Units covered/To be covered** | **Topics covered/To be covered** |
| 29/08/2024-12/09/24  (2 weeks) | Introduction to Environmental Studies | Multidisciplinary nature of environmental studies; Components of environment: atmosphere, hydrosphere, lithosphere, and biosphere. Scope and Importance; Concept of sustainability and sustainable development; Brief history of environmentalism |
| 13/09/2024-20/10/2024  (5 weeks) | Ecosystems | Definition and concept of Ecosystem; Structure of ecosystem (biotic and abiotic components). Functions of Ecosystem: Physical (energy flow), Biological (food chains, food web, ecological succession), and Biogeochemical (nutrient cycling) processes. Concepts of productivity, ecological pyramids and homeostasis Types of Ecosystems: Tundra, Forest, Grassland, Desert, Aquatic (ponds, streams, lakes, rivers, oceans, estuaries). Importance and threats with relevant examples from India; Ecosystem services (Provisioning, Regulating, Cultural, and Supporting). Ecosystem preservation and conservation strategies; Basics of Ecosystem restoration |
| 21/10/2024-26/11/2024  (5-6 weeks) | Natural Resources | Land Resources: Minerals, soil, agricultural crops, natural forest products, medicinal plants, and forest-based industries and livelihoods; Land cover, land use change, land degradation, soil erosion, and desertification; Causes of deforestation; Impacts of mining and dam building on environment, forests, biodiversity, and tribal communities. Water Resources: Natural and man-made sources of water; Uses of water; Over exploitation of surface and ground water resources; Floods, droughts, and international & inter-state conflicts over water. Energy Resources: Renewable and non-renewable energy sources; Use of alternate energy sources; Growing energy needs; Energy contents of coal, petroleum, natural gas and biogas; Agro-residues as a biomass energy source. Case studies: Contemporary Indian issues related to mining, dams, forests, energy, etc (e.g., National Solar Mission, Cauvery River water conflict, Sardar Sarovar dam, Chipko movement, Appiko movement, Tarun Bharat Sangh, etc). |
| 27/11/2024-24/12/2024  (4 weeks) | Environmental pollution | Environmental pollution (Air, water, soil, thermal, and noise): causes, effects, and controls; Primary and secondary air pollutants. Air and water quality standards; Nuclear hazards and human health risks. Solid waste management: Control measures for various types of urban, industrial waste, Hazardous waste, E-waste, etc; Waste segregation and disposal. Pollution case studies: Ganga Action plan (GAP), Delhi air pollution and public health issues, Plastic waste management rules, Bhopal gas tragedy, etc. |
| 29/08/2024- 24/12/2024 | Practicals | **Unit 1**  1. Analysis of achievement of Sustainable Development Goals of any country.  2. Gain insights of sustainability framework for an industrial activity using activity worksheets.  **Unit 2**  1. Schematic collection of data for depicting ecological pyramids in the College campus  2. Differentiation of natural and managed ecosystems using Google Earth/Google Map  3. Field visit to terrestrial and aquatic ecosystems (forests, grasslands, wetlands, biodiversity parks, etc.)  4. Develop a working model of any ecosystem.  **Unit 3**  1. Visit to a paper recycling unit/rainwater harvesting plant/solar plant in the College campus  2. Develop and understand working model of renewable/non-renewable sources of energy  3. Mapping of natural resources of a given study area using Google Earth and Time-series analysis of natural resource consumption of a given country using publicly available data  **Unit 4**  1. Determine water quality of a given location using rapid pollution monitoring kits. & Identify suitability of given water samples for various purposes using given kits  2. Assess air quality index (AQI) of any location using real-time air quality parameters  3. Determine magnitude of solid waste generated in a home/college on a monthly basis & Develop and maintain compost/vermicompost using biodegradable waste in the College  4. Prepare a water audit report of the college/house/locality/colony and Map solid and liquid discharge of the college/colony and develop a management plan (show it using schematic diagram, and photographs. |

**CURRICULUM PLAN**

**(Semester III, 2024-25)**

**Name-** Dr. Akansha Rai

**Subject**- Environmental Sciences (AEC) ( 01 Theory and 02 hours Practical)

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| --- | --- | --- |
| **Days** | **Units covered/To be covered** | **Topics covered/To be covered** |
| 01/08/2024-08/09/24  (5-6 weeks) | Global Environmental Issues and Policies | Causes of Climate change, Global warming, Ozone layer depletion, and Acid rain; Impacts on human communities, biodiversity, global economy, and agriculture. International agreements and programmes: Earth Summit, UNFCCC, Montreal and Kyoto protocols, Convention on Biological Diversity (CBD), Ramsar convention, The Chemical Weapons Convention (CWC), UNEP, CITES, etc. Sustainable Development Goals: India’s National Action Plan on Climate Change and its major missions. Environment legislation in India: Wildlife Protection Act, 1972; Water (Prevention and Control of Pollution) Act, 1974; Forest (Conservation) Act 1980; Air (Prevention & Control of Pollution) Act, 1981; Environment Protection Act, 1986; Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. |
| 21/09/2024-20/10/2024  (5-7 weeks) | Biodiversity and Conservation | Definition of Biodiversity; Levels of biological diversity: genetic, species and ecosystem diversity; India as a mega- biodiversity nation; Biogeographic zones of India; Biodiversity hotspots. Endemic and endangered species of India; IUCN Red list criteria and categories; Value of biodiversity: Ecological, economic, social, ethical, aesthetic, and informational values of biodiversity with examples; sacred groves and their importance with examples. Threats to biodiversity: Habitat loss, degradation, and fragmentation; Poaching of wildlife; Man-wildlife conflicts; Biological invasion with emphasis on Indian biodiversity; Current mass extinction crisis. Biodiversity conservation strategies: in-situ and ex-situ methods of conservation; National Parks, Wildlife Sanctuaries, and Biosphere reserves; Keystone, Flagship, Umbrella, and Indicator species; Species reintroduction and translocation. Case studies: Contemporary Indian wildlife and biodiversity issues, movements, and projects (e.g., Project Tiger, Project Elephant, Vulture breeding program, Project Great Indian Bustard, Crocodile conservation project, Silent Valley movement, Save Western Ghats movement, etc) |
| 28/10/2024-28/11/2024  (5-6 weeks) | Human communities and the Environment | Human population growth: Impacts on environment, human health, and welfare; Carbon foot-print; Resettlement and rehabilitation of developmental project affected persons and communities; relevant case studies; Environmental movements: Chipko movement, Appiko movement, Silent valley movement, Bishnois of Rajasthan, Narmada Bachao Andolan, etc; Environmental justice: National Green Tribunal and its importance Environmental philosophy: Environmental ethics; Role of various religions and cultural practices in environmental conservation Environmental communication and public awareness: case studies (e.g., CNG vehicles in Delhi, Swachh Bharat Abhiyan, National Environment Awareness Campaign (NEAC), National Green Corps (NGC) “Eco-club” programme, etc). |
| 01/08/2024- 28/11/2024 | Practicals | **Unit 5**  1. Depict temperature/precipitation trend of a given study area using online data  2. Formulate questionnaire/online surveys for assessment of the impact of climate change on people  3. Assess Nationally Determined Contributions (NDCs) of developed and developing countries  4. Development and simulation of Moot Court for Mock Trials in Negotiation Green Tribunal  5. Identify the carbon footprint of your college. (refer vvvvf@envis.nic.in).  6. Analyze the status of at least 3 sustainable development goals in your neighborhood and write a proposal to help achieve them at global standard (identify environmental problems and its social and economic impact, define objectives, explain methodology, budgetary requirements, and suggest the expected outcome). A PowerPoint presentation to be made based on the project proposal.  **Unit 6**  1. Acquaintance with open-source databases of biodiversity  2. Determine species location in a given study area  3. Depict distribution of biodiversity across latitude and altitude  4. Show species distribution across space and time  5. Quantify species loss across different time periods  6. Sampling of plant and animal biodiversity of the College campus  7. Identification of the floral diversity of Delhi and other states. Documentation of the plants by clicking pictures, finding out the scientific names/ local names through literature or mobile applications, identification of their conservation status (IUCN red book list), medicinal properties, water consumption status, and socio-economic-environmental importance. A short report to be submitted) (Virtual Tour)  8. Exercise to understand the socio-economic-environmental impact of wildlife conservation. (Students can choose any global animal species and identify the relevance of the species for the ecosystem/ society/ culture/ local economy, historic or present range of the species, emerging threats due to human activities, identification of documented events of natural disasters/ conflicts/ poaching of the species in the present range, conservation status (WON red book list), identification of protected areas/ programs of the government/ international organization, and their opinion to further improve the conservations of the species. A short report to be submitted.  **Unit 7**  1. Visit to marginalized localities and students for environmental education and environmental awareness.  2. Formulation of questionnaire/online surveys for assessment of the impact of environmental education  3. Visit to any developmental project affected locality for assessing the impacts of economic development on human lives. |