CCC704: Environmental Studies

COURSE AIM: The aim of this course is to provide to undergraduate students the **basic knowledge** about Environment, **both natural and anthropogenic**, in different spatio-temporal domains (**local, regional, global**). More specifically, it discusses the **multidisciplinary nature of the Environmental Studies, renewable and non-renewable resources, biodiversity and ecosystems** both in India and over the globe. In a second level, it provides knowledge about the different kinds of pollution, the influence of environmental degradation on human health, nature and ecosystems and the global concern of greenhouse gases, climate change and its implications and sustainable development.

SN	COURSE UNIT/Module (MARKS)	No of Lectures	1st half (Marks)	2nd half (Marks)	Total Marks 100
1	**Multidisciplinary nature of Environmental Studies: (5)** Introduction to Environmental Studies: What is Environment? How does the Environment affect us? How have we affected the environment and its adverse impacts: *(i) Pollution- air, water- Ganga pollution, land, plastic, (ii) Deforestation- desertification, (iii) Biodiversity loss – unsustainable utilization, invasive species (iv) Land use- Land cover changes- Urbanization, Loss of forests, Agricultural lands, Industrialization, Highways (v) Greenhouse gases- Ozone depletion, Global warming, Climate Change (vi) Natural Hazards and Disasters: Landslides, Droughts, Floods, Disease epidemics*; Environmental Impact Assessment; Why is it important to conserve and protect the environment? Environmental awareness – Environmental Ethics, Environmental Laws, Environmental Education, Environment Days, Reasons to study about the Environment; Environmental Science vs. Environmental Studies; Description of Course on Environmental Studies – Course content, Faculty responsible, Recommended books; Evaluation	**2/3**	**07**	**---------**	**07**
2	**Ecosystems: (8)** Concept, structure and function of ecosystems; Bio-geochemical cycles; ecological succession, producers, consumers; food chains, food web, ecological pyramids; Introduction, types, characteristic features, structure and function of ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)	**8**	**15**	**---------**	**15**
3	**Biodiversity and its conservation: (10)** Introduction – Definition : genetic, species and ecosystem diversity; Bio-geographical classification of	**8**	**15**	**---------**	**15**

	India; Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values; Biodiversity at global, National and local levels India as a mega-diversity nation; Hot-spots of biodiversity; Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts; Endangered and endemic species of India; Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.				
	Natural Resources: (10) General description of renewable and non-renewable resources; Forest resources, Water resources, Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies**; Mineral and land resources; Rocks and minerals; Influence** of the anthropogenic activities in the environment, Deforestation, Desertification, Drought, Land use – land cover changes; Wasteland reclamation; Solar radiation, solar spectrum, solar energy, Wind energy; Role of society in conservation of natural resources; Equitable use of resources for sustainable lifestyles.	**6**	**3**	**10**	**13**
4	**Environmental Pollution: (10)** Definition; Cause, effects and control measures: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards; Solid waste Management: Causes, effects and control measures of urban and industrial wastes; Disaster management : floods, earthquake, cyclone and landslides; Role of society in prevention of pollution with Pollution case studies.	**5**	**---------**	**9**	**9**
5	**Global Environment issues: (8)** Climate change, Green house effect and global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust; Global organizations; IPCC reports. Acid rain and its impact, Ozone depletion Urban problems related to energy and water; Urbanization; Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people -problems and concerns;	**8**	**---------**	**9**	8
6	**Human population and Environment: (10):** Population growth in developed and developing	**3 /4**	**---------**	**4**	**4**

	countries; Human Rights Women and Child Welfare; Impacts on human health; **HIV/AIDS and diseases; Environmental protection acts for biodiversity, air,** water, wildlife, forest; Governmental and Inter-governmental policies; Information technology and environment; Environmental Ethics; Environmental awareness.				
7	**Sustainable Development: (6)** Definition and Concept; Practical aspects and Objectives; From Unsustainable to Sustainable development; Strategies for sustainable development; Global concern for sustainable development;	**1/2**	**---------**	**3**	**3**
	THEORY (70)	**43**	**40**	**35**	**75**
9	**FIELD STUDY AND REPORT SUBMISSION: (25)** Students will visit a major environmental site – **Yamuna Biodiversity Park**, Butterfly Garden, Wildlife Sanctuary , Wetland, Forest, Industrial Pollution (Air/Water), **Okhla Sewage Treatment Plant, Timarpur Waste Management Plant,** Landfill site, **NTPC Thermal Power Station**, etc. and submit a detailed Essay/ Field Study Report in a specific Format **within 15 days.**	**05**			**25**
	TOTAL		**41**	**43**	**100**

ASSESSMENT SCHEME:

- **Midterm evaluation :35%**
- **Final Exam: :40%**
- **Report/Assignment Field Study: 25%**

Field Visits & Reporting

- Study biodiversity -common plants, animals, insects and birds and their habitat – *Biodiversity Park, Bird Sanctuary* _**Yamuna Biodiversity Park and Aravalli Biodiversity Park: TERI GRAM or any place of Environmental Concern.**
- Study simple ecosystems such as agriculture, ponds, rivers and hill slopes – *Wetlands, Forests*
- Visit a local area to document environmental problems in forest, grassland, wet lands, agriculture fields, hill or mountain.
- Visit a local polluted site in an urban, rural, industrial or agricultural environment – *Industrial area, Waste disposal- landfill site*
- **Prepare an illustrated Report (in format) on Field Visit**

Format for the Report

1. **Title Page** (Main title of the Field Report, Name, ID, Date of Visit, Date report submitted (16/14 points Times Roman Bold)

2. **Content** with **pagination** (14 points Times Roman)

3. **Introduction**: History of the place of visit, Map, location, background, characteristics, Tour Itinerary, persons met/interacted (12 points Times Roman)

4.**Observations:** Headings/Subheadings Bold 12 points Times Roman; Text 12 points not Bold New Times Roman)

5. **Discussion and Conclusions**: Lessons learnt and Ecological / Environmental implications. It should be written in your own language and not copied from internet. (Text 12 points not Bold New Times Roman)

6. **References**: Numbered full citation, website, etc. (Text 10 points not Bold New Times Roman)

Give illustrations at appropriate places- photographs **with captions,** graphs, histograms in colour/B/W – mention the credit- whether yours or somebody else's illustration and source.

All the pages should be numbered.

RECOMMENDED BOOK(S):

Environmental Studies, Joseph Benny: TMH, 2009, (ISBN: 978-0-07-0648135)

A Textbook Of Environmental Studies for Undergraduate students (As per UGC Syllabus), D K Asthana and Meera Asthana, 2009 (2014 Edition) S. Chand (ISBN: 81-219-2764-1)

Environmental Studies by R J Ranjit Daniels and Jagdish Krishnaswamy, Wiley India 2010 (ISBN:978-81-265-1943-9)

Environmental Science, Wagner,Travis. : Wiley, 2010

Fundamentals of Ecology, Odum, E.P. , 1971, W.B. Saunders Co. USA, 574 p.

Environmental Pollution: Management And Control for sustainable Development, R. K. Khitoliya,R K. : S Chand, 2007 (ISBN: 81-219-2385-9)

Fundamental of Air Pollution, Bsubel, Richard W.: Academic, 2009.

People and Environment / Miller,G Tyler. : Cengage , 2009

Renewable Energy/ Godfrey Boyle, Oxford University Press.

Disaster Management: Text and Cases, Murthy, D B N.: Deep & Deep, 2008.