**GRAPHIC ERA UNIVERSITY, DEHRADUN**

**First Semester 2016-2017**

**Course Handout**

**Course No.: TEV 101**

**Course Title: Environmental Science**

**Instructor(s): 1. Dr. Pratibha Naithani**

**2. Dr. Pradeep Kumar Sharma**

**3. Dr. Archana Bachheti**

**4. Mrs. Shalini Jha**

**Course Description:**

Environmental Science for undergraduates includes class room teaching and field work. In Graphic Era University the syllabus is divided into five units. The first four units cover lectures to enhance awareness, knowledge, skills and attitude to environment. Unit five is based on field activities which provide students firsthand knowledge on various local environmental aspects.

**Scope & Objective:**

The need for sustainable development is a key to the future of mankind. Problems of pollution, loss of biodiversity, solid waste disposal, degradation of environment, issues like economic productivity and national security, global warming, depletion of ozone layer , acid rain have made everyone aware of environmental issues.

The primary objective of environmental science is to create an environment friendly mindset and attitude among all sections of the society. This will lead to the development of environmental ethics and increase the value people place on conservation of life and biodiversity in the environment.

**Text Book(s):**

TB1 Deswal, S. & Deswal A.: A Basic Course In Environmental Studies; Dhanpat Rai & Co.

TB2 Srivastava Smrti: Environmental Studies; Katson books.

**Reference Book(s):**

R1 Joseph K. & Nagendran R.: Essentials of Environmental studies; Pearson Edition

R2 Santra S. C., Environmental Science; Central Book Agency.

R3 Dhameja, S. K.:Environmental Studies; Katson books.

**Course Plan:**

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| **Lecture no.** | **Topics to be covered** | **Reference Chap/Sec (Book)** |
| **1.** | General Introduction about Environment, components and segments of Environment | TB1 Chap 1 |
| **2.** | Definition of Environmental Science, its multidisciplinary nature, Objectives, importance and scope of Environmental Science | TB1 Chap 1 |
| **3.** | Definition of ecosystem and its components | TB1 Chap 3 |
| **4.** | Food Chain, Food Web, Energy and nutrient flow, | TB1 Chap 3 |
| **5.** | Ecological Pyramids, Biogeochemical cycle | TB1 Chap 3 |
| **6.** | Biogeochemical cycle, Ecological Succession | TB1 Chap 3 |
| **7.** | Introduction , types, characteristic features, structure and function of Forest ecosystem, Grassland ecosystem and Desert ecosystem | TB1 Chap 2 |
| **8.** | Introduction , types, characteristic features, structure and function of Pond ecosystem and Ocean Ecosystem | TB1 Chap 3 |
| **9.** | Definition and classification of natural resources, Types of natural resources | TB1 Chap 2 |
| **10.** | Forest Resources- use and overexploitation , deforestation, case studies | TB1 Chap 2 |
| **11.** | Effect of timber extraction, mining and building dams on forests and tribal people | TB1 Chap 2 |
| **12.** | Water Resources- use and over-utilization of surface and ground water, floods, drought, conflicts over water | TB1 Chap 2 |
| **13.** | dams- benefits and problems, Water conservation, rainwater harvesting, watershed management | TB1 Chap 2 |
| **14.** | Mineral Resources- Use and exploitation , environmental effects of extracting and using mineral resources, case studies | TB1 Chap 2 |
| **15.** | Food Resources- World food problems, changes in landuse by agriculture and grazing, effects of modern agriculture | TB1 Chap 2 |
| **16.** | Fertilizer/ pesticide problems, water logging and salinity  Energy Resources- increasing energy needs, renewable/ non renewable, urban problems related to energy, case studies, use of Alternate energy sources (solar) | TB1 Chap 2 |
| **17.** | Use of Alternate energy sources (Solar, wind) | TB1 Chap 2 |
| **18.** | Use of Alternate energy sources (hydro and geothermal) | TB1 Chap 2 |
| **19.** | Land resources- land as a resource, land degradation, man induced land-slides, soil erosion and desertification, wasteland reclamation | TB1 Chap 2 |
| **20.** | Role of an individual in conservation of natural resources, equitable use of resources for sustainable lifestyles | TB1 Chap 2 |
| **21.** | Definition of biodiversity, levels of biodiversity, Values of biodiversity | TB1 Chap 4 |
| **22.** | Threats to biodiversity (habitat loss, poaching of wildlife, man-wildlife conflicts), Biodiversity at global, national and local levels, India as a biodiversity nation | TB1 Chap 4 |
| **23.** | Biogeographical classification of India, Red data book, Endangered and endemic species of India, hotspots of biodiversity | TB1 Chap 4 |
| **24.** | Conservation of biodiversity- In-situ and ex-situ conservation of biodiversity | TB1 Chap 4 |
| **25.** | Definition of Pollution, Pollutants, types of environmental pollution and pollutants, Air pollution and its sources | TB1 Chap 5 |
| **26.** | Classification of air pollutants, effects, control strategies and devices for air pollution | TB1 Chap 5 |
| **27.** | Definition of water pollution, sources, impact and toxic effects of some of the pollutants (Bioaccumulation, biomagnifications, Eutrophication) | TB1 Chap 5 |
| **28.** | Parameters (DO, BOD, COD), control measures, waste water treatment process | TB1 Chap 5 |
| **29.** | Thermal pollution (its causes, effects and mitigation), Noise pollution (its causes, effects and mitigation) | TB1 Chap 5 |
| **30.** | Marine pollution (its causes, effects and mitigation), Nuclear pollution (its causes, effects and mitigation) | TB1 Chap 5 |
| **31.** | Soil pollution (its causes, effects and mitigation), Definition of Solid waste, Causes, effects, mitigation | TB1 Chap 5 |
| **32.** | Solid waste management, role of an individual in prevention of pollution,pollution case studies | TB1 Chap 5 |
| **33.** | Introduction of important environmental issues, green house effect, climate change, global warming (its causes, effect and mitigation) | TB1 Chap 6 |
| **34.** | Smog, Ozone layer depletion, nuclear accidents and holocaust (its causes, effect and mitigation) | TB1 Chap 6 |
| **35.** | Case studies, floods, cyclone, earthquake and landslides ((its causes, effect and mitigation), Disaster management | TB1 Chap 5 |
| **36.** | Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act | TB1 Chap 6 |
| **37.** | Environment Impact Assessment (EIA) and steps involved in EIA, | R1 Chap6 |
| **38.** | Issues involved in enforcement of Environmental Legislation, Public awareness, Environment and human health | TB1 Chap 6 |
| **39.** | Sustainable development, | TB1 Chap 6 |
| **40.** | Environmental ethics (issues and possible solutions) | TB1 Chap 6 |
| **41.** | Consumerism and waste products, Human rights | TB1 Chap 6, 7 |
| **42.** | Resettlement and rehabilitation of people (its problems and concerns, case studies) | TB1 Chap 6 |
| **43.** | Population, population growth, its variation among nation | TB1 Chap 7 |
| **44.** | Population explosion (family welfare programme) | TB1 Chap 7 |
| **45.** | Value education, HIV/ AIDS, Women and Child Welfare | TB1 Chap 7 |
| **46.** | Role of Information Technology in Environment and human health, case studies | TB1 Chap 7 |

**Evaluation Scheme:**

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| **S. No.** | **Component** | **Duration** | **Marks** | **Weightage (%)** |
| 1. | Mid Term Test | 2 hrs | 60 | 30 |
| 2. | End Term Examination | 3 hrs | 100 | 60 |
| 3. | Class Participation |  | 10 | 5 |
| 4. | Assignments (4)\* |  | 40 | 5 |
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|  | Total |  |  | 100 |

\*Total four assignments will be given in the entire semester of 10 marks each.

1. Assignment 1 Environmental Science and Ecosystem
2. Assignment 2 Natural Resources and Biodiversity
3. Assignment 3 Environmental Pollution
4. Assignment 4 Important Environmental and Social Issues, Management and Legislation

**Chamber Consultation Hour:**

1. Dr. Pratibha Naithani: Monday 11-12:30 pm
2. Dr. Pradeep Kumar Sharma: Tuesday 10-11:30 am
3. Dr. Archana Bachheti: Tuesday 9-10:30 am
4. Mrs. Shalini Jha: Thursday 11-12:30 pm