

DEPARTMENT OF  
ENVIRONMENTAL SCIENCE  
UNIVERSITY OF KASHMIR  
SRINAGAR-190006



M.Sc. in Environmental Science

**CHOICE BASED CREDIT BASED COURSE STRUCTURE TO BE  
IMPLEMENTED FROM ACADEMIC SESSION 2017**

**Generic Elective and Open Elective course outline**

Course	Course Code	Course Name	Paper category	Hours/Week			Credits
				L	T	P	
Generic Elective	ENS17GE01	Basics of Ecology and Environment	GE	1	1		2
	ENS17GE02	Biogeography	GE	1	1		2
	ENS17GE03	Analytical Instrumentation	GE	1	1		2
	ENS17GE04	Environmental Issues	GE	1	1		2
	ENS17GE05	Crenobiology	GE	1	1		2
	ENS17GE06	Industrial Ecology	GE	1	1		2
	ENS17GE07	Strategic Environmental Assessment	GE	1	1		2
Open Elective	ENS17OE01	Environmental Ethics and Sociology	OE	1	1		2
	ENS17OE02	Global Environmental Problems	OE	1	1		2
	ENS17OE03	Environmental Protection	OE	1	1		2
	ENS17OE04	Sustainable Development	OE	1	1		2

## COURSE DESCRIPTIONS GENERIC ELECTIVE

### **ENS17GE01: Basics of Ecology and Environment (2 credits)**

#### **Unit I**

- 1.1 Importance of environment
- 1.2 Components of environment-Atmosphere, hydrosphere, lithosphere and biosphere
- 1.3 Human and environment relations
- 1.4 Environment and development
- 1.5 Tools for environmental management

#### **Unit II**

- 1.1 Structure and functions,
- 1.2 Natural and managed ecosystem
- 1.3 Ecosystem goods and services
- 1.4 Ecological Succession
- 1.5 Ecological Interactions

### **ENS17GE02: Biogeography (2 credits)**

#### **Unit 1**

- 1.1. Biodiversity and its importance
- 1.2. Threats to biodiversity
- 1.3. Hotspots of Biodiversity
- 1.4. Major biomes of the world: Distribution and characteristic features
- 1.5. Biogeography: Processes and patterns

#### **Unit II**

- 1.1. Geographical classification and zones
- 1.2. Zoogeographic realms of the world: Palaearctic, Nearctic, Neotropical, Oriental, Australian and African
- 1.3. Dispersal: Means, modes and barrier
- 1.4. Migrations
- 1.5. Conservation Biogeography

### **ENS17GE03: Analytical Instrumentation (02 credits)**

#### **Unit I**

- 1.1. Stoichiometry
- 1.2. Titrimetry and gravimetry
- 1.3. Visible and UV spectroscopy
- 1.4. Atomic absorption spectrophotometry
- 1.5. Principle and applications of microscopy

#### **Unit II**

- 1.1. Chromatography-Basic Principle and its classification
- 1.2. Ion-exchange Chromatography
- 1.3. Gas liquid Chromatography/GC-MS
- 1.4. HPTLC and HPLC
- 1.5. Spectro-fluorimetry

### **ENS17GE04: Environmental Issues (03 credits)**

#### **Unit I**

- 1.1. History and nature of human population growth
- 1.2. Natural resources, current status and types of resources
- 1.3. Resource depletion

- 1.4. Environment and human health
- 1.5. Environmental degradation

**Unit II**

- 1.1 Air pollution
- 1.2 Water pollution
- 1.3 Soil Pollution
- 1.4 Noise pollution
- 1.5 Radioactive pollution

**ENS17GE05: Crenobiology**

**(02 Credits)**

**Unit I**

- 1.1.Springs as critical biotopes
- 1.2.Classification of springs
- 1.3.Spring discharge and biology of spring biotopes
- 1.4. Delineation of spring protection zones
- 1.5.Vulnerability assessment and mapping of spring waters

**Unit II**

- 1.1.Inventory and monitoring of springs
- 1.2.Spring water geochemistry and recharge
- 1.3.Springs as ecosystems
- 1.4. Case study of major springs
- 1.5.Conservation and management of spring ecosystems

**ENS17GE06: Industrial Ecology**

**(02 credits)**

**Unit I**

- 1.1. Basic principles of green chemistry
- 1.2. Application and need of green chemistry
- 1.3. Concept of green economy, green growth and low carbon development
- 1.4. Introduction to industrial ecology and its relation to the concept of sustainability
- 1.5. Principles and objectives of industrial ecology

**Unit II**

- 1.6. Industrial symbiosis, industrial ecosystems and eco industrial parks
- 1.7. Ecology and biomimicry
- 1.8. Future and challenges of industrial ecology
- 1.9. Concept of green technology
- 1.10. Ecomark scheme and eco-friendly products

**ENS17GE07: Strategic Environmental Assessment**

**(02 credits)**

**Unit I:**

- 1.1. Origin of EIA:
- 1.2. Concept and objectives of EIA
- 1.3. EIA process
- 1.4. Baseline data collection
- 1.5. EIA guidelines 2006

**Unit II:**

- 1.1 Protocol for environment impact statements
- 1.2 EIA methods
- 1.3 Strategic environmental assessment
- 1.4 SEA process
- 1.5 Case studies

## COURSE DESCRIPTIONS OPEN ELECTIVE

### **ENS17OE01: Environmental Ethics and Sociology (2 Credits)**

#### **Unit I**

- 1.1. An introduction to environmental ethics and philosophy
- 1.2. Ethics in society
- 1.3. Responsibility for environmental degradation
- 1.4. Theories of environmental ethics and philosophy
- 1.5. Resource consumption patterns and the need for equitable utilization

#### **Unit II**

- 1.1. Role of agriculture in socio-economic development
- 1.2. Land reforms and Bhoodan movement in India
- 1.3. Community development projects
- 1.4. Rural social structure
- 1.5. Ecological theories of urbanization and urban social problem

### **ENS17OE02: Global Environmental Problems (02 Credits)**

#### **Unit I**

- 1.1 Acid rain
- 1.2 Ozone depletion
- 1.3 Deforestation
- 1.4 Biodiversity loss
- 1.5 Global warming and climate change

#### **Unit II**

- 1.1. Role of an individual in conservation of natural resources
- 1.2. General idea about environmental laws
- 1.3. International conventions (Stockholm declaration)
- 1.4. Kyoto protocol and Montreal protocol
- 1.5. Earth summit

### **ENS17OE03: Environmental Protection (02 Credits)**

#### **Unit I**

- 1.6. Role of an individual in conservation of natural resources
- 1.7. General idea about environmental laws
- 1.8. International conventions (Stockholm declaration)
- 1.9. Kyoto protocol and Montreal protocol
- 1.10. Earth summit

#### **Unit II**

- 1.1. Environment management
- 1.2. Control of soil, water and air pollution
- 1.3. Solid and hazardous waste management
- 1.4. Biodiversity conservation
- 1.5. Natural resource management

### **ENS17OE04: Sustainable Development (2 credits)**

#### **Unit I**

- 1.1. Concept and strategies of sustainable development
- 1.2. Principles of ecological economics – scope and usefulness
- 1.3. Prey-predator and supply-demand cycles

1.4. Environment and trade

1.5. Sustainability of society, resources and framework

**Unit II**

1.1. Valuation of ecosystem services

1.2. Natural resources accounting

1.3. Landmark events in sustainability (Agenda 21)

1.4. Changes in institutional and environmental governance framework

1.5. Moving towards sustainability: An Indian perspective