

CORE MODULE SYLLABUS FOR ENVIRONMENTAL STUDIES
FOR UNDER GRADUATE COURSES OF ALL BRANCHES
OF HIGHER EDUCATION

Unit 1 : The Multidisciplinary nature of environmental studies

Definition, scope and importance

(2 lectures)

Need for public awareness.

Unit 2: Natural Resources :

Renewable and non-renewable resources :

Natural resources and associated problems.

- a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) Food resources: World food problems , changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies

- e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

(8 lectures)

Unit 3 : Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecological pyramids.
- Introduction, types, characteristic features, structure and function of the following ecosystem :-
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem

- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lectures)

Unit 4 : Biodiversity and its conservation

- Introduction – Definition : genetic, species and ecosystem diversity.
- Biogeographical classification of 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.

(8 lectures)

Unit 5 : Environmental Pollution

Definition

- Causes, effects and control measures of :-
 - a. Air pollution
 - b. Water pollution
 - c. Soil pollution
 - d. Marine pollution

- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards
- Solid waste Management : Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management : floods, earthquake, cyclone and landslides.

(8 lectures)

Unit 6 : Social Issues and the Environment

- From Unsustainable to Sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people ; its problems and concerns. Case studies.
- Environmental ethics : Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation.
- Consumerism and waste products.
- Environment Protection Act.
- Air (Prevention and Control of Pollution) Act.

- Water (Prevention and control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation.
- Public awareness.

(7 lectures)

Unit 7 : Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – Family Welfare Programme.
- Environment and human health.
- Human Rights.
- Value Education.
- HIV / AIDS.
- Women and Child Welfare.
- Role of Information Technology in Environment and human health.
- Case Studies.

(6 lectures)

Unit 8 : Field work

- Visit to a local area to document environmental assets-river / forest / grassland / hill / mountain

Structure of distribution of marks and credit under CBCS

Subject – ENVIRONMENTAL STUDIES (AECC-1)

B.Sc, BA, B.Com., BBA/BCA Honours Program and Program

Course		Marks	Credit	Total Credit
Semester 1	Theory	40	1.6	2
	Field Work	10	0.4	

Syllabus for Environmental Studies (AECC-1) under CBCS

B.Sc, BA, B.Com., BBA/BCA Honours Program and Program

ENVS (AECC-1) Course- 1 (Credit – 2)

Theory (credit – 1.6)

Full Marks: 40

2018

Unit 1: Introduction to environmental studies

- Multidisciplinary nature of environmental studies
- Scope and importance; Concept of sustainability and sustainable development.

1 lecture

Unit 2: Ecosystems

- What is an ecosystem?
Structure and function of ecosystem;
Energy flow in an ecosystem: food chains, food webs and ecological succession.
Case studies of the following ecosystems:
 - a) Forest ecosystem
 - b) Grassland ecosystem
 - c) Desert ecosystem
 - d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

4 lectures

Unit 3: Natural Resources: Renewable and Non – renewable Resources

- Land resources and land-use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over – exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state), Dams – benefits and problems.
- Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, waterlogging, salinity.
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies

4 lectures

Unit 4: Biodiversity and Conservation

- Levels of biological diversity: genetic, species and ecosystem diversity; Bio-geographic zones of India; Biodiversity patterns and global biodiversity hotspots.
- India as a mega-biodiversity nation; Endangered and endemic species of India, threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions.
- Conservation of biodiversity: In – situ and Ex – situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution

- Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies

4 lectures

Unit 6: Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

3 lectures

Unit7: Human Communities and the Environment

- Human population growth: Impacts on environment, human health and welfare. Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Water conservation, rain water harvesting, watershed management.
- Wasteland reclamation.
- Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

4 lectures

(Any two of the following 1-4)

1. Visit to local polluted site (**any one**) (4)
 - a) Urban: Identify the major sources of air pollution in a city or town of North Bengal region.
 - b) Rural: Analyse the major sources of organic pollution in villages and adjoining agricultural fields.
 - c) Industry: Prepare a list of the large and medium industries in and around your college area and the probable pollutants they may produce.

2. Study of flora and fauna (**any one**) (4)
 - a) Prepare a list of the economic plants available in the college block.
 - b) List the birds sighted and found nesting at the college campus and its surroundings with the season of their occurrence.
 - c) Record insects associated with any common crop/grassland/tree of the college area with an idea of their habitat.

3. Visit to local area to document environmental assets (**any one**): (4)
 - a) Trip to any riverine system of Terai or the dooars: comment on the direction, volume and quality of water, flowing as observed.
 - b) Record the nature of vegetation/forest type/land use pattern at the site of visit.
 - c) Analyse the cause of deforestation and landslide on hill slope, if sighted.

4. Study of ecosystems. (**any one**) (4)
 - a) Pond: water parameters – turbidity, pH, producers (phyto and zooplanktons) and related consumers (fishes and birds).
 - b) Grassland on hill slope: producers (plants), insects, consumers (birds, mammals, reptiles etc.)
 - c) Forest: practical concept of forest type, stories, dominant trees and sub – dominant vegetation, observed and reported major herbivores and carnivores in a forest ecosystem.

5. Submission of a field work (covering the above practical works undertaken) (2)

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[Dr. Monoranjan Chowdhury]
Signature of the Chairmen
Board of Under-Graduate Studied
Environmental Studies

Truncated Syllabus for Environmental Studies (AECC-1) under CBCS B.Sc., BA, B.Com
BBA/BCA Honours Program and Program
Course- 1 (Credit – 2)

Theory Full Marks: 80

Credit: 1.6

Unit 1: Introduction to environmental studies

4 Lectures

Scope and importance; Concept of sustainability and sustainable development.

Unit 2: Ecosystems

What is an ecosystem?

Structure and function of ecosystem;

Energy flow in an ecosystem, food chains, food webs and ecological pyramid

Unit 3: Natural Resources: Renewable and Non – renewable Resources

Land resources and land-use change; Land degradation, soil erosion and desertification.

Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.

Water: Use and over – exploitation of surface and ground water, floods, droughts, Dams – benefits and problems.

Food resources: effects of modern agriculture, fertilizer-pesticide problems

Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources

4 Lectures

Unit 4: Biodiversity and Conservation

Levels of biological diversity : genetic, species and ecosystem diversity; biodiversity hotspots

India as a mega---biodiversity nation; Endangered and endemic species of India, threats to biodiversity: Habitat loss, poaching of wildlife, man---wildlife conflicts.

Conservation of biodiversity: In – situ and Ex – situ conservation of biodiversity.

Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

4 Lectures

Unit 5: Environmental Pollution

Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution

Nuclear hazards and human health risks

Solid waste management

3 Lectures

Unit 6: Environmental Policies & Practices

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture

Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

3 Lectures

Field Work (Full Marks – 15)

1. Study of flora and fauna (any one) (5)
 - a) Prepare a list of the economic plants available in the nearby locality.
 - b) List the birds sighted and found nesting in the nearby locality and its surroundings with the season of their occurrence.
 - c) Record insects associated with any common crop/grassland/tree of local area with an idea of their habitat.
2. Visit to local area to document environmental assets (any one): (5)
 - a) Trip to any riverine system of Terai or the Dooars: comment on the direction, volume and quality of water, flowing as observed.
 - b) Record the nature of vegetation/forest type/land use pattern at the site of visit.
 - c) Analyze the cause of deforestation and landslide on hill slope, if sighted.
3. Submission of a field work (covering the above practical works undertaken) (5)

Equals to 6 Lectures