SRI VENKATESWARA UNIVERSITY:TIRUPATI

SUBJECT: ENVIRONMENT SCIENCE

SEMESTER-IV – W.E.F. 2024-25

COURSE 3: BIODIVERSITY AND CONSERVATION

Theory Credits: 3 3 hrs/week

Learning Objectives

This course provides an overview of biodiversity, its significance, threats, and conservation strategies. Topics include the definition and measurement of biodiversity, ecological patterns and processes, human impacts on biodiversity, conservation biology principles, and practical approaches to biodiversity conservation.

Learning Outcomes

- To understand the concept of biodiversity and its importance for ecosystem function and human well-being.
- To examine the threats to biodiversity, including habitat loss, pollution, climate change, and invasive species
- Develop critical thinking and problem-solving skills in the context of biodiversity conservation.
- To evaluate conservation strategies and policies aimed at protecting and restoring biodiversity.
- To explore the principles and methods of conservation biology for preserving biodiversity.
- To study the Bio geographical regions and Hot spots of India

Unit I-Biodiversity Introduction

No. of Hours: 9

Definition and concept of Biodiversity -types of biodiversity (species, ecosystem, genetic) uses, importance and values of biodiversity: (consumptive, productive, social, ethical, aesthetic, scientific and option values), methods of measuring biodiversity (alpha, beta and Gamma)

Unit II-Biodiversity at International and National Level

No. of Hours: 9

Bio diversity at international, national and local levels, Bio geographical regions of India, Hot spots of biodiversity (Eastern Himalayas - Western Ghats) - India as a mega diversity nation.

Unit III-Threats to Biodiversity

No. of Hours: 9

Natural and anthropogenic disturbances; habitat loss, habitat degradation, and habitat fragmentation; climate change; pollution; hunting; over-exploitation; deforestation; hydropower development; invasive species; land use changes; overgrazing; man, wildlife conflicts; consequences of biodiversity loss

Unit 1V- Conservation of Biodiversity No. of Hours: 9

Importance of biodiversity patterns in conservation; In-situ conservation (Biosphere Reserves, National Parks, Wildlife Sanctuaries); Ex-situ conservation (botanical gardens, zoological gardens, gene banks, seed and seedling banks, pollen culture, tissue culture and DNA banks

Unit V – Conservation Strategies of Biodiversity No. of Hours: 9

Extinction - Endangered and-Endemic species; Project Tiger and project Elephant; project Rhino, project Vulture. Role of Indian organizations - National Green Tribunal, National Conservation of Tiger Authority, Botanical Survey of India, and Forest research Institute in conservation efforts. Red data book; IUCN, WWF and Greenpeace, role of local communities and traditional knowledge in conservation

Skills Outcome

On Successful Completion of this paper, Student will be able to

1. Learn about, importance and values of biodiversity
2. Learn about Hot spots of Biodiversity
3. Learn about Threats to biodiversity
4. Learn about In-situ and Ex-situ conservation methods
5. Learn about Conservation strategies at national and international levels

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COURSE 3: BIODIVERSITY AND CONSERVATION

Practical **Credits: 1** **2 hrs/week**

1. Conduct biodiversity surveys using standardized sampling techniques (e.g., transect sampling, quadrat sampling)
2. Collect data on species richness, abundance, and distribution in different habitats
3. Estimation of Species Diversity.
4. Visit to institute of citrus research station, Tirupati
5. Visit to zoological park
6. Analysis of Extinction - Endangered -Endemic species in and around Tirumala, Tirupati.
7. Identifications of Plant species of your locality - Common herbs, shrubs, trees, aquatic plants

References:

1. Anubha Kaushik., C P Kaushik., Environmental studies, New age international publishers III edition, 2010.
2. Krishnamurthy, K.V. 2004. An Advanced Text Book of Biodiversity Principles and Practices. Oxford and IBH Publications CoPvt.Ltd.New Delhi.
3. Singh, J. S., Singh, S.P. & Gupta, S. 2006. Ecology, Environment and Resource Conservation.Anamaya Publications, New Delhi.
4. Sodhi, N.S. & Ehrlich, P.R. (Eds). 2010. Conservation Biology for All. Oxford University Press.
5. Sodhi, N.S., Gibson, L. & Raven, P.H. 2013. Conservation Biology: Voices from the Tropics.Wiley-Blackwell, Oxford, UK.
6. Pielou E.C., Ecological Diversity, John Wiley & Sons, New York (1975).
7. Stracey P.D., Wild Life in India – Its Conservation and Control,
8. Dr.M.Satyanarayana,Dr.M.V.R.K.Narasimhacharyulu,Dr,G.Rambabu and Dr.V.Viveka vardhani, Environmental studies, vardhani published by Telugu academy,Hyderabad
9. R.C.Sharma, Gurbir sangha, Environmental studies, published by kalyani publishers
10. Purnima smarath, Environmental studies, kalyani publihers

CO-Curricular Activities

a) Suggested Co-Curricular Activities

1. Assignments
2. Seminars, Group Discussions on related topics
3. Conducting a Quiz
4. Charts preparation
5. Paper clips collection

FOUR YEAR MINOR DEGREE EXAMINATION – 2024
CHOICE BASED CREDIT SYSTEM
FOURTH SEMESTER
PAPER – 3: BIODIVERSITY AND CONSERVATION
(w.e.f. the academic year 2024-25)
MODEL QUESTION PAPER

Time: 3 Hours Max.Marks: 70

Section-A

Answer Any Four Questions. Each question carries 5 marks (4X5= 20M)

1. Write the values of biodiversity.
2. Explain the hot spots of India.
3. Explain wildlife conflicts
4. Write a short note on biosphere reserve.
5. Status of Tiger project in India
6. Write a short note on alpha measurement of biodiversity.
7. Explain Endangered, -Endemic species of India

Section-B

Answer ANY questions. Each question carries 10 marks (5X10= 50M)

8. (a) Define biodiversity; Explain types and use of biodiversity

Or

(b) Describe the concept and importance of biodiversity.

9. (a) Explain Bio geographical regions of India.

Or

(b) Explain Bio diversity at international, national and local levels

10. (a) What are the threats to bio diversity in detail

Or

(b) Explain Natural and anthropogenic disturbances of biodiversity loss

11. (a) Explain Ex-situ conservation method of biodiversity.

Or

(b) Explain In-situ conservation method of biodiversity

12. (a) Explain Role of Indian organizations for conservation of biodiversity

Or

(b) Role of local communities and traditional Knowledge in Conservation of biodiversity

SRI VENKATESWARA UNIVERSITY:TIRUPATI

SUBJECT: ENVIRONMENT SCIENCE

SEMESTER-IV – W.E.F. 2024-25

COURSE 4: ENVIRONMENTAL POLLUTION

Theory **Credits: 3** **3 hrs/week**

Learning Objectives

This course examines the sources, impacts, and management of environmental pollution. Topics include air pollution, water pollution, soil contamination and hazardous waste disposal. The course also explores regulatory frameworks, pollution control technologies, and sustainable solutions to mitigate pollution.

Learning Outcomes

- To understand the sources, pathways, and impacts of different types of environmental pollution.
- Understand impacts of air, water, soil, noise, thermal, radioactive pollution on human health and environment.
- Illustrate effects of pesticides and fertilizers on soil**.**
- Realize sources and impacts of thermal pollution, its effect on water quality.
- Gain knowledge on control of environmental pollution.
- To promote awareness and advocacy for pollution prevention and sustainable development

Unit 1- Environmental Pollution

No. of Hours: 9

Basic concepts and definitions of pollution: Sources and classification of environmental pollution.

Air pollution**:** Definition, causes of air pollution, classification of air pollutant - primary and secondary pollutants its effects, Control measures of Air Pollution, case study of Bhopal gas tragedy, Visakhapatnam gas leakage and endosulphan tragedy in Karnataka.

Unit II- Water Pollution and Thermal Pollution

No. of Hours: 9

Water pollution: Definition, Sources, types of water pollutants including organic and inorganic contaminants, nutrients, heavy metals, pathogens, its effects and Control measures.

Thermal pollution: Causes and Sources of Thermal Pollution, Effects - Impact on Aquatic Ecosystems - Impact on Water Quality, Control measures.

Unit III: Soil Pollution and Noise Pollution

No. of Hours: 9

Soil Pollution: Causes and Sources of Soil Pollution, Types of Soil Pollutants - heavy metals, pesticides and industrial chemicals, soil pollution effects and its control measures.
Noise Pollution: Introduction – measurement of noise, Sources, Effects of noise pollution – physiological and psychological effects and its control measures.

Unit IV: Radioactive Pollution

No. of Hours: 9

Radioactive material and sources of radioactive pollution; effect of radiation on human health (somatic and genetic effects); Safe disposal of radioactive waste – Radiation protection and control measures, Chernobyl disaster, Fukushima disaster

Unit V: Marine Pollution

No. of Hours: 9

Marine resources and their importance; sources of marine pollution; oil spill and its effects and coral reefs and their demise; coastal area management; existing challenges and management techniques (planning, construction, environmental monitoring of coastal zones), Minamata episode - Role of an individual for prevention of environmental pollution

Skills Outcome

On Successful Completion of this Course, Student will be able to

1. Learn about basic knowledge of environmental pollution and control
2. Learn about; oil spill and its effects and coral reefs
3. Learn about Minamata diseases
4. Learn about Permissible levels of noise
5. Learn about carcinogenic effect radioactive pollution on human being

SEMESTER-IV

COURSE 4: ENVIRONMENTAL POLLUTION

Practical **Credits: 1** **2 hrs/week**

1. Estimation of Turbidity
2. Determination of TS, TSS & TDS
3. Estimation of Acidity
4. Estimation of Alkalinity
5. Estimation of Hardness of water
6. Estimation of Chlorides
7. Estimation of Dissolved Oxygen
8. Estimation of Fluorides
9. Determination of BOD in the given waste water
10. Collection and estimation of CO_2 level by using High volume sampler

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11. C. S. Rao, Environmental pollution control engineering.. New Age International Publishers.
12. APHA 1998. Standard Methods for the examination of water and wastewater, 20th Ed.
13. S. K. Maiti, Water and Wastewater analysis Volume 1. Handbook of methods in environmental studies. ABD Publishers 2004.
14. S. K. Maiti , Soil analysis Volume 2. Handbook of methods in environmental studies.. ABD Publishers 2004

CO-Curricular Activities

a) Suggested Co-Curricular Activities

1. Organizing Eco club activities to promote eco-friendly green belts
2. Promoting awareness to create a clean and pollution free environments
3. Seminars, Group discussions, Quiz, Debates on related topics.
4. Invited lectures and presentations on related topics by experts in the specified area
5. Organising awareness programmes on environmental pollution
6. Encouraging to students pollution free practices, any event or curricular activity

FOUR YEAR MINOR DEGREE EXAMINATION – 2024
CHOICE BASED CREDIT SYSTEM
FOURTH SEMESTER

PAPER – 4: ENVIRONMENTAL POLLUTION

(w.e.f. the academic year 2024-25)

MODEL QUESTION PAPER

Time: 3 Hours Max.Marks: 70

Section-A

Answer Any Four Questions. Each question carries 5 marks (4X5= 20M)

1. Write a short note on Bhopal gas tragedy.
2. Explain the water born diseases.
3. Write a short note on psychological effects of noise.
4. Chernobyl disaster.
5. Explain oil spill and its effects.
6. Explain briefly about organic pollutants in water.
7. Write about soil conservation practices.

Section-B

Answer ANY questions. Each question carries 10 marks (5X10= 50M)

8. (a) Write an essay on environmental pollution.

Or

(b) Explain the sources, pollutants and effects and control measures of air pollution.

9. (a) Define water pollution; explain causes, effects and control of water pollution

Or

(b) Describe thermal pollution

10. (a) Explain the causes, effects and control measures of soil pollution.

Or

(b) Explain Noise pollution causes, measurements, effects and control measures

11. (a) Describe radioactive pollution and control measures.

Or

(b) Explain briefly about somatic and genetic disorders of nuclear hazards.

12. (a) Describe marine pollution and its control measures

Or

(b) Explain the role of an individual for prevention of environmental pollution