Curriculum Framework for Environmental Education at the UG level

INTRODUCTION:

The National Education Policy (NEP) 2020 underlines the importance of making environmental education an integral part of curricula and encouraging environmental awareness and sensitivity towards its conservation and sustainable development. NEP also advocates the attainment of holistic and multidisciplinary education, through flexible and innovative curricula for all Higher Education Institutions (HEIs) which shall include credit-based courses and projects in the areas of community engagement and service, environmental education, and value-based education.

Global attention to the deteriorating condition of our environment was drawn in the United Nations Conference on Environment and Development held in Rio de Janerio in 1992 and World Summit on Sustainable Development at Johannesburg in 2002. Out of the 17 Sustainable Development Goals (SDGs), six goals are directly linked to environmental protection and resource conservation.

Environment Education, therefore, needs to include areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development.

The Experiential Learning Module under the SAHAAYA program at St. Aloysius (Deemed to be University) is implemented through a structured plan comprising orientation session, intellectual engagement and hands-on field-based activities such as beach cleanups, tree plantations, composting, and visits to ecological sites. This Experiential Learning Module is monitored and guided by student mentors who will ensure timely participation, documentation, and reflection. The progress and completion status of each student is regularly updated to the faculty members handling Environmental Studies, ensuring proper coordination, evaluation, and integration with the academic framework. Additionally, the various activities listed in the module is organized and conducted by the institution for students to participate in, ensuring accessibility and structured implementation. By linking theoretical concepts of Environmental Studies with real-world applications, this module

enhances conceptual understanding, critical thinking, and long-term commitment to environmental and social responsibility.

The present document is an outcome of St Aloysius (Deemed to be University), Mangaluru, initiative to implement Environmental Studies under the National Education Policy, 2020 which has emphasized the need to formulate guidelines and curriculum framework for environmental education. The document is expected to cater to students from diverse disciplinary backgrounds and to sensitize them about the commitment of our nation towards achieving sustainable development goals and addressing global environmental challenges.

CURRICULUM FRAMEWORK OUTLINE

Unit	Title	Incorporated chapters	Teaching hours
I	Humans and the Environment	Module 1	15Hrs
II	Natural Resources and Sustainable Development	Module 1	
III	Environmental Issues: Local, Regional and Global	Module 2	15Hrs
IV	Conservation of Biodiversity and Ecosystems	Module 1 and 2	
V	Environmental Pollution and Health	Module 2	
VI	Climate Change: Impacts, Adaptation and Mitigation	Module 2	
VII	Environmental Management	Module 3	15Hrs
VIII	Environmental Treaties and Legislation	Module 3	
IX	Case Studies and Field Work	Module 4	15Hrs

Total credits of the Course = 4

As per UGC Curriculum and Credit Framework for Undergraduate Programmes a one credit of tutorial work means one-hour engagement per week. In a semester of 15 weeks duration, a one credit tutorial in a course is equivalent to 15 hours of engagement.

A one credit course in community engagement and services, and field work in a semester means two-hour engagement per week. In a semester of 15 weeks duration, a one credit practicum in a course is equivalent to 30 hours of engagement. Three credits are for Theory component and one credit is for Experiential Learning Module.

CREDIT STRUCTURE

Course Code	Title of the Course	Instructions Hours/ week	Duration of Exam	Marks			Credits
				IA	Semester End Exam	Total	
Semester – I/II							
LS2AUVE131 a	Environmental Studies	45+15	2.5Hrs	40	60	100	4

PROGRAMME OUTCOMES (PO)

PO 1:	To comprehend the importance and dimension of a healthy environment, become environmentally conscious, skilled and responsible.
PO 2:	To understand the significance and issues related to ecosystems, natural resources and biodiversity and become aware of the need and ways to protect or preserve them.
PO 3:	To assess the issues associated with climate change, solid waste management, and environmental degradation and take preventive measures to fulfill their environmental obligations.
PO 4:	To make students aware of the environmental policies and movements, and the role of individuals and communities in environmental protection for educating and inspiring the young minds.

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO 1:	To acquire in-depth knowledge about the resources and natural processes that sustain life.
PSO 2:	Students will be able to identify the multidisciplinary nature of Environmental studies and develop initiatives resolving different ecological issues.
PSO 3:	Applying sustainable practices in personal and professional life.
PSO 4:	Students will be able to critically think to assess environmental problems, identify root causes, and evaluate potential solutions.
PSO 5:	In addition to research opportunities in environmental studies, students have the opportunity to teach at the secondary or higher educational level.

Course Outcomes:	
CO 1:	To make students understand the importance and their role in the protection and maintenance of a healthy environment for sustainable development.
CO 2:	To empower students to grasp the significance and issues related to ecosystems, biodiversity and natural resources, and ways of managing or protecting them.
CO 3:	To enable students to have a nuanced understanding of environmental pollution, solid waste management and climate change and to act with concern on environmental issues.
CO 4:	To make students aware of the environmental policies and movements for educating and inspiring the young minds.

Paper Code

St Aloysius (Deemed to be University)	
Mangaluru - 575003	
End Semester Exam – Month Year	
BA/BSc. /BCA/BCom/BBA - Semester – I/II	
Paper Title	
Time: 2½ hrs.	**Max. Marks 60**
Part A- Environmental Studies	
SECTION - A	
I.	**Answer any <u>TEN</u> of the following: 2X10=20**
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
SECTION – B	
II.	**Answer any <u>THREE</u> of the following: 5X3=15**
13.	
14.	
15.	
16.	
III.	**SECTION – C**
	Answer any <u>ONE</u> of the following: 10X1=10
17.	
18.	
19.	
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SYLLABUS

Semester I/II		
Course Code:	**LS2AUVE131**	
Title of the Course:	**ENVIRONMENTAL STUDIES**	
Course Credits	**No. of Hours per Week**	**Total No. of Teaching Hours**
4	3+1	45+15

COURSE CONTENTS:

Module 1: Humans and Environment. **15Hrs**

Introduction, Scope and importance. Multidisciplinary nature of environmental studies. Environmental ethics: Role of religions and cultures in environmental conservation (Anthropogenic and Eco - centric perspectives) World Commission on Environment and Development, Rio Summit.

Concept of Ecology. Ecosystems – Definition, Structure and function of ecosystem**,** Food chains – grassland and detritus, food webs. Biotic and abiotic factors of Pond and Forest ecosystem. Concept of Ecological succession- stages. Case studies of the following ecosystems:

a) Grassland ecosystem

b) Desert ecosystem

c) Aquatic ecosystems – (oceans, estuaries)

Natural Resources and Sustainable development: renewable and non-renewable resources: Soil resources – importance, soil erosion and desertification, conservation measures. Forest resources – definition, importance, Conservation of forest resources, Forest Types (Coniferous, Deciduous and Evergreen), Forest products. Water resource – importance, conservation of water resources - Rain water harvesting, water shed management. Use and over-exploitation of surface and ground water. Conflicts over water.

Energy resources: Sources of energy and their classification, Renewable and non-renewable energy sources. Conventional energy sources – coal, oil, natural gas, nuclear energy, Non-conventional energy sources -solar, wind, tidal, hydro, wave, thermal, geothermal, biomass energy. Concept of sustainable development, Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies.

Module 2: Biodiversity and Conservation. Environmental Pollution 15 Hrs

Biodiversity: Definition. Levels of biological diversity - Genetic, Species and Ecosystem diversity. Biogeographic zones of India. Biodiversity hotspots of India. IUCN, Man and Biosphere (MAB). Endangered and Endemic species of India. Threats to biodiversity: Deforestation, Habitat loss, poaching of wildlife, biological invasions, mining and dam construction.

Conservation of biodiversity: In-situ and Ex-situ methods. Values of biodiversity; Direct value – Consumptive, productive values, Indirect value - Social, ethical and aesthetic and scientific values. Conservation of coastal and Mangrove ecosystem. Global biodiversity hotspots; India as a mega-biodiversity nation.

Environmental Pollution - Local, Regional and Global Issues

Environmental Pollution: Air pollution-causes, effects and control measures. Climate change, global warming, ozone layer depletion, acid rain - impacts on human communities and vegetation. Smog. Water pollution – causes, effects and control measures. Soil pollution causes, effects and control measures. Solid waste management - Control measures of urban and industrial waste. Hazardous wastes.

Module 3: Environmental Management, Treaties and Legislation 15Hrs

Environmental management system: ISO 14001, Environment audit and impact assessment, Ecolabeling/Ecomark scheme. International agreements: Montreal and Kyoto protocols. Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). Environment protection agencies WWF, BNHS, CEC. Disaster management: Definition, Causes, effects and management of Floods, Earthquake, Cyclones and Landslides. Resettlement and rehabilitation of project affected human community.

Environment Laws: The Environment (Protection) Act 1986, The Wildlife (Protection) Act, 1972. Biodiversity Act, 2002, Forest Conservation Act, 1980, The Water (Prevention and Control of Pollution) Act, 1974, The Air (Prevention and Control of Pollution) Act, 1981, Notification on Coastal Regulation Zone. Tribal populations and rights.

Module 4: Experiential Learning 15Hrs

Objective: To provide hands-on learning experiences that raise awareness and instill responsibility towards environmental and social issues through active participation in sustainability initiatives.

SAHAAYA – A Project on Social Responsibility:

This experiential learning module is integrated with the **SAHAAYA** program of St. Aloysius

(Deemed to be University), which requires students to complete **40 hours of social service over two semesters**. SAHAAYA aims to **sensitize students to social and environmental issues**, encouraging them to witness real-world challenges and contribute towards sustainability and community welfare. The program follows an experiential learning model incorporating **learning, context, experience, reflection, action, and evaluation**, fostering holistic student development and civic engagement.

Course Components:

1. Community and Environmental Engagement

Beach Cleanup Drive – Understanding marine pollution and its impact on biodiversity.

Tree Plantation & Seed Ball Preparation – Creating and dispersing seed balls to promote reforestation.

Rainwater Harvesting Project – Hands-on training in constructing small-scale rainwater harvesting structures.

Visit to AL-Vana Miyawaki Forest – Learning about urban forestation and biodiversity conservation.

Visit to a Material Recovery Facility – Understanding solid waste management and segregation processes.

Nature Walk – Observing local flora and fauna while learning about ecosystem dynamics.

2. Sustainable Waste Management

Vermicomposting Workshop – Learning composting techniques and their benefits.

Setting up a Composting Bin – Practical implementation of organic waste composting at the household level.

Visit to a Recycling Facility – Understanding the processes involved in recycling different materials.

Recycling Waste & Upcycling Plastics as Planters – Creative repurposing of waste materials for sustainable use.

3.Eco-friendly Alternatives & Awareness

Paper Bag Making and Distribution – Promoting sustainable alternatives to plastic bags.

Awareness Program on Waste Management, Pollution, and Eco-friendly Alternatives – Conducting community outreach campaigns.

Campus Biodiversity Assessment – Documenting and analyzing flora and fauna within the campus to understand ecological health. **Sustainable Lifestyle Practices** – Encouraging the use of eco-bricks, organic gardening, and zero-waste initiatives.	
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