

Attributes & SDGs Common for all branches/Disciplines

Course Code	Course Title	Attributes							SDGs No.
ES103	Environmental Studies & Sustainability	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	
						√			SDGs 6,13,14,& 15

Department of Computer Application
Effective from Session:

Course Code	ES103	Title of the Course	Environmental Studies and Sustainability	L	T	P	C
Year	I	Semester	I	2	1	0	3
Pre-Requisite	10+2	Co-requisite					

Course Objectives

The course is designed to introduce undergraduate students to the fundamental concepts of environmental studies and sustainability. It aims to foster awareness and understanding of natural systems, human impacts on the environment, and the importance of sustainable development. Through an interdisciplinary approach, the course encourages students to explore environmental challenges such as pollution, climate change, resource depletion, and biodiversity loss, while also learning about sustainable solutions, environmental policies, and individual and collective responsibilities towards a more sustainable future.

Course Outcomes

CO1	To introduce students to the structure and functioning of natural ecosystems and the interdependence between biotic and abiotic components, enabling a scientific understanding of the environment.
CO2	To create awareness about major environmental issues such as air and water pollution, climate change, deforestation, biodiversity loss, and waste management, along with their causes and consequences
CO3	To familiarize students with the principles and practices of sustainable development, focusing on balancing environmental protection, economic growth, and social equity.
CO4	To equip students with a critical understanding of environmental protection laws and policies in India
CO5	Adopt sustainability as a practice rules and regulations, in life, society, and industry

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Humans and the Environment	The man-environment interaction: Humans as hunter-gatherers; Mastery of fire; Origin of agriculture; Emergence of city-states; Great ancient civilizations and the environment; Middle Ages and Renaissance; Industrial revolution and its impact on the environment; Population growth and natural resource exploitation; Global environmental change. The emergence of environmentalism: Anthropocentric and eco-centric perspectives (Major thinkers); The Club of Rome- Limits to Growth; UN Conference on Human Environment 1972; World Commission on Environment and Development and the concept of sustainable development; Rio Summit and subsequent international efforts.	9	CO1
2	Environmental Challenges and Human Impact	Air, water, Thermal, Marine, soil, and noise pollution: causes, effects, control measures, Waste management: solid, biomedical, and e-waste, Global environmental issues: climate change, ozone depletion, acid rain Natural disasters and human vulnerability, Case studies of environmental degradation.	9	CO2
3	Conservation of Biodiversity and Ecosystems	Biodiversity as a natural resource; Levels and types of biodiversity; Biodiversity in India and the world; Biodiversity hotspots. Major ecosystem types in India and their basic characteristics; Ecosystem services- classification and their significance. Threats to biodiversity and ecosystems, Major conservation policies: in-situ and ex-situ conservation approaches; National and International Instruments for biodiversity conservation; the role of traditional knowledge, community-based conservation; Gender and conservation.	8	CO1
4	Sustainable Development and Environmental Governance	Introduction to sustainable development, Principles of sustainability and sustainable resource use, Sustainable agriculture, water conservation, energy efficiency, and green technology, UN Sustainable Development Goals (SDGs), especially SDG 6, 7, 11, 12, 13, 14, and 1, all targets and indicators, challenges and strategies for SDGs. Traditional ecological knowledge and community-based resource management: Role of individual and institutional actions in sustainability. Environmental protection acts and policies in India (e.g., the EPA, the Forest Act, the Biodiversity Act) Role of government, NGOs, and international organizations (e.g., UNEP, IPCC), Environmental justice, ethics, and equity, Civic responsibility and environmental movements in India, Campus and community-level environmental initiatives.	9	CO3, CO4 & CO5
5	Case Studies and Field Work	<ul style="list-style-type: none"> • Discussion on one national and one international case study related to the environment and sustainable development. • Field visits to identify local/regional environmental issues, make observations, including data collection, and prepare a brief report. • Documentation of campus biodiversity. • Campus environmental management activities such as solid waste disposal, water management, and sewage treatment. 	10	CO1, CO2, CO3, CO4, CO5

Reference Books:

- 1) Agarwal, K.C. 2001 Environmental; Biology, Nidi Pub. Ltd. Bikaner.
- 2) Bharucha Erach, The Biodiversity of India, Mapin Pub. Pvt. Ltd., Ahmedabad-380, India.
- 3) Brunner R.C. 1989. Hazardous waste incineration, Mc Graw Hill
- 4) Clark R.S. Marine Pollution, Clanderon Press Oxford (TB)
- 5) Cunningham W.P.2001.Cooper, T.H. Gorhani, E & Hepworth, Environmental encyclopedia, Jacob Publication House, Mumbai.
- 6) De. A.K. Environmental chemistry Willey Eastern Limited.
- 7) Glick, H.P.1993 water in crisis, Pacific Institute for studies in dev, Environment & security, Stockholm Env, Institute, Oxford Univ, Press 473 p.
- 8) Hawkins R .E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay.
- 9) Heywood, V.H. & Watson, R. T.1995.Global biodiversity Assessment.Cambridge Univ. Press 1140 p.
- 10) Jadhave, H. and Bhosale, V. M. 1995 Environmental protection and laws, Himalaya pub, house, Delhi.284 p.

11) Mckinnery, M.L. and School, R. M.1996 Environmental science systems and solutions, web enhanced edition 639 p.
12) Mhaskar A.K. Matter Hazardous, Techno Science Pub (TM)
13) Miller T.G. Jr, Environmental Ecology, W. B. Saunders Co.USA,574 p. 16
14) Odum, E.P.1997.Fundamental chemistry, Goel Pub House Meerut.
15) Survey of the Environment, The Hindu (M).
16) Sharma B.K.2001.Environmental Chemistry, Goel Pub House Meerut

e-Learning Source:

https://byjus.com/biology/difference-between-environment-and-eCOsystem .
https://www.youtube.com/watch?v=dRPI4TB8w7k
https://www.youtube.com/watch?v=3fbEVtyJCK
https://www.vedantu.com/biology/conservation-of-biodiversity
https://youmatter.world/en/definition/soil-erosion-degradation-definition/
https://byjus.com/biology/difference-between-environment-and-eCOsystem .

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																		
PO- PSO CO	PO 1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	2	1	-	-	-	-	-	-	-	2	-	-	-	-
CO3	-	-	-	-	1	2	-	-	-	-	-	-	-	1	-	-	-	-
CO4	-	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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