



## B.Tech (All Branches)

### Attributes & SDGs Common for all branches/Disciplines

Course Code	Course Title	Attributes							SDGs No.
ES102	Concept of Environmental Studies	Employability	Entrepreneurship	Skill Development	Gender Equality	Environment & Sustainability	Human Value	Professional Ethics	SDGs 6,13,14,& 15
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#### Effective from Session:

Course Code	ES102	Title of the Course	Concept of Environmental Studies	L	T	P	C
Year	I	Semester	I/II	2	1	0	3
Pre-Requisite	10+2	Co-requisite					
Course Objectives	<p>The objectives of environmental studies are Creating awareness about environmental problems among people and imparting basic knowledge about the environment and its allied problems.</p> <p>The importance of environmental science and environmental studies cannot be disputed. The need for sustainable development is a key to the future of mankind. Continuing problems of pollution, loss of forest, solid waste disposal, degradation of the environment, issues like economic productivity and national security, Global warming, the depletion of the ozone layer and loss of biodiversity have made everyone aware of environmental issues</p>						

#### Course Outcomes

CO1	Students will be able to <b>understand</b> about relationship between Humans and Environment
CO2	<b>Understand</b> about Ecosystem, Biodiversity and Conservation
CO3	<b>Identifying</b> environmental pollution, its impact on humans, ecosystems and control measures through latest technologies
CO4	<b>Analyze and apply</b> knowledge for understanding complex environmental- economic-social challenges, and active participation in solving current environmental problems and preventing the future ones
CO5	<b>Evaluate</b> the Environmental crisis and can propose effective environmental management

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	<b>Unit I. Humans and the Environment</b>	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)	06	CO1
2	<b>Unit II. Natural Resources, Ecosystem and Biodiversity</b>	Overview of natural resources: Definition, Classification and types of natural resources; Status and challenges. 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.	10	CO2
3	<b>Unit III. Environmental Pollution and International Treaties</b>	Understanding pollution: Production processes and generation of wastes; Assimilative capacity of the environment; Definition of pollution; Point sources and non-point sources of pollution. Air pollution: Sources; Primary and secondary pollutants; Indoor air pollution; National Ambient Air Quality Standards. Technology to mitigate air pollution Water pollution: Sources; River, lake, and marine pollution, groundwater pollution; Water quality parameters and standards; Technology to mitigate water pollution Soil pollution and solid waste; Solid and hazardous waste; Technology to mitigate waste pollution Noise pollution: Definition; Unit of measurement of noise pollution; Sources of noise pollution; Noise standards; Technology to mitigate noise pollution Thermal and Radioactive pollution: Sources, impacts and Technology to mitigate pollution	10	CO3
4	<b>Unit IV. Climate Change: Impacts, Adaptation and Mitigation</b>	Observed impacts of climate change on ocean and land systems; Sea level rise, changes in marine and coastal ecosystems; Impacts on forests and natural ecosystems; Impacts on animal species, agriculture, health, urban infrastructure, Indigenous knowledge for adaptation to climate change.  Major International Environmental Agreements: CBD; Cartagena Protocol on Biosafety; Nagoya Protocol on Access and Benefit-sharing; CITES; Ramsar Convention; UNCCD; Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol and the Kigali Amendment; Basel Convention; Stockholm Convention; Minamata Convention; UNFCCC; Kyoto Protocol; Paris Agreement; India's status as a party to major convention.  Major Indian Environmental Legislations, Industry-specific environmental standards; Waste management rules; National Green Tribunal; Some landmark Supreme Court judgments	10	CO4
5	<b>Case Studies and Field Work</b>	<ul style="list-style-type: none"> <li>• Discussion on one national and one international case study related to the environment and sustainable development.</li> <li>• Field visits to identify local/regional environmental issues, make observations including data collection and prepare a brief report.</li> <li>• Documentation of campus biodiversity.</li> <li>• Campus environmental management activities such as solid waste disposal, water management, and sewage treatment.</li> <li>• Model Making</li> </ul>	09	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)

#### e-Learning Source:

- <https://byjus.com/biology/difference-between-environment-and-eCOsystem>.
- <https://www.youtube.com/watch?v=dRPI4TB8w7k>



	Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4		
CO																		
CO1	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-		
CO2	-	-	1	-	-	-	3	-	1	-	-	-	-	-	1	1		
CO3	-	-	2	-	-	-	3	-	1	-	-	-	-	-	1	1		
CO4	-	-	2	-	-	-	2	-	1	-	-	-	-	-	1	1		
CO5	-	-	1	-	-	-	2	-	1	-	-	-	-	-	1	1		

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

Name & Sign of Program Coordinator	Sign & Seal of HOD
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