GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology	Branch/ Spec.	ALL
Semester	I	Version	1.0.0.0
Course Code	2BSC1105	Course Name	Environmental Science
Effective from Academic Year	2026-27	Effective for the batch Admitted in	July 2026
Course Category	BSC		

Teaching, Learning and Examination Scheme

Teaching & Learning Scheme							Examination scheme (Marks)					
Hours (per week)				Cr	SL	TSL	Theory			Practical		
L	TU	P	TTH				CE	SEE	Total	CE	SEE	Total
2	0	0	2	2	30	60	50	50	100	00	00	00

L: Lecture, TU: Tutorial, P: Practical, TTH: Total Teaching Hours/Week, Cr: Credit, SL: Min. Self Learning/Term Work Hours/Sem, TSL: Min. Total Teaching & Learning Hours/Sem, CE: Continuous Evaluation, SEE: Semester End Examination,

Pre-requisites

-None-

Course Outcomes

COs	Description
CO1	Explain the fundamental concepts of environmental studies, ecology, ecosystems, and the interrelationship between environmental components and engineering activities.
CO2	Analyze various types of environmental pollution, their sources, impacts, and current environmental issues affecting sustainability and human well-being.
CO3	Describe global and national environmental policies, laws, governance frameworks, and regulatory compliance processes relevant to engineering practice.
CO4	Apply principles of sustainability and resilience in engineering and infrastructure planning with reference to climate resilience and national sustainability goals.

Theory Syllabus

Unit	Content	Hrs
1	**Introduction to Environmental Studies** Definition, interdisciplinary scope, Engineering roles, Environmental Components-Atmosphere, Hydrosphere, Lithosphere, Biosphere; Definitions: sustainability vs resilience vs development	03
2	**Ecology and Ecosystems** Introduction to Ecology, Ecosystem: Food chain, water cycle, Carbon Cycle, Nitrogen Cycle, Energy Flow, Ideal Ecosystem, Artificial Ecosystem, Engineering impacts on ecosystems	04
3	**Environmental Pollution** Air Pollution: Sources, Types, effects, and impact; Water Pollution: Sources, Types, effects, and impact; Land Pollution: Sources, Types, effects, and impact; Soil & Hazardous Waste, Marine Pollution, Noise, Light, Radiation	06
4	**Current Environmental Issues** Climate Change and Global Warming; Urbanization, Air Quality Crisis, Water Crisis and Water Security; Solid Waste, Plastic Waste and Marine Pollution; Infrastructure and Environmental Degradation; Fossil Fuel Dependency, Biodiversity Loss and Ecosystem Degradation; Environmental Risk, Disasters and Resilience	08
5	**Environmental Policy, Laws & Governance** Global Frameworks: UN SDGs, Paris Agreement; National Environmental Laws: Environment (Protection) Act, 1986, Water Act 1974, Air Act 1981, Environment Audit Rules 2025, End-of-Life Vehicles Rules 2025, Green Credit Programme; Regulatory Compliance: EIA/EMP processes, Environmental Clearance procedures	05
6	**Sustainability and Resilience Principles** Definition, Sustainability Metrics, Resilience Thinking, Climate Resilience, Green Building & Sustainable Materials, India's Goal 2047, India's Sustainability planning and programme.	04

Practical Content		
Practical and Term work shall be based on the laboratory experiments as well as the field survey.		
Text Books		
1	Environmental Studies by Author: Anindita Basak. Pearson Education India	
2	Textbook of Environmental Studies by Author Dr. D. Dave and Dr. S. S. Katewa.Cengage Learning India	
Reference Books		
1	Environmental Science by G. Tyler Miller and Scott Spoolman. Cengage Learning	
2	An Introduction to Sustainable Development by P. P. Rogers, K. F. Jalal and J. A. Boyd. Earthscan Publications Ltd.	
3	Environmental Studies: From Crisis to Cure by R. Rajagopalan. Oxford University Press, India	
ICT/MOOCs Reference		
1	https://nptel.ac.in/courses/109105203	
2	https://onlinecourses.nptel.ac.in/noc23_hs155/preview	
3	https://www.coursera.org/learn/environmental-science	
4	https://www.coursera.org/specializations/environmental-science	

Mapping of Cos, POs, and PSOs

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
CO1	2	1	0	2	3	2	1	0	0	1	1	3	2	2
CO2	1	2	0	2	3	3	2	0	0	1	1	2	2	3
CO3	1	2	0	1	2	3	3	0	1	1	2	3	2	3
CO4	1	1	2	2	3	3	3	1	1	2	2	3	2	3

Unit	Unit Title	Aligned COs	Learning Hours	BTL Level
1	Introduction to Environmental Studies	CO1	3	1 - 2
2	Ecology and Ecosystems	CO1	4	2 - 4
3	Environmental Pollution	CO2	6	2 - 4
4	Current Environmental Issues	CO2	8	2 - 5
5	Environmental Policy, Laws & Governance	CO3	5	1 - 5
6	Sustainability and Resilience Principles	CO4	4	2 - 6

Note:

- Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)
- L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work CE= Continuous Evaluation, SEE= Semester End Examination
- 1 Hour Lecture = 1 Credit, 1 Hour Tutorial = 1 Credit, 2 Hours Practical = 1 Credit, 2 Hours Internship/Project/Seminar = 1 Credit
- As per NCrF/NEP 2020, Minimum Self-Learning or Term Work Hours per Semester should be calculated in such a way that 1 Credit should have minimum 30 Hours of Teaching and Self Learning Engagement per semester