

Branch Name:	BCA (Bachelor of Computer Application)
Program Code:	CS101
Course Title:	Environmental Science and sustainability
Course Code:	21-VAC101-1C
Pre-requisite Course:	Basic knowledge of high school-level science and a keen interest in environmental issues.

Course Objective:

This course is intended to make the students to equip students with mathematical tools for precise specification, analysis, and reasoning in computer science.

1. To Introduce the Fundamental Concepts of Environmental Science and Sustainability.
2. To Develop Understanding of Ecosystem Structure, Function, And Biodiversity.
3. To Analyse Human Impacts on The Environment and Natural Resources.
4. To Explore Global Environmental Challenges Such as Pollution and Climate Change.
5. To Examine Sustainable Development Practices and Green Technologies.

Teaching and Examination Scheme:

Teaching Scheme (Hours. per week)				Evaluation Scheme (Marks)								
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory				Practical				Total
				University Assessment		Continuous Assessment		University Assessment		Continuous Assessment		
				Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	
2	-	-	2	09	25	09	25	-	-	-	-	50

Course Contents:

Sr. No	Topics	Total Hours	Weightage (%)
1	Introduction of Environment to Natural Resource and Conservation Definition and scope, components of the environment, ecological balance interrelationship between organisms and environment. Renewable and non-renewable resources, forest, water, mineral, and energy resources conservation techniques	6	25
2	Ecosystem to Environmental Pollution: Types of ecosystems, structure and functions, biodiversity—types, value, threats and conservation methods, Types of pollution – Air, Water, Soil, Noise, Causes, Effects, Control Measures, Solid and E-Waste Management.	6	25
3	Climate Change and Green Practice: Global warming, greenhouse effect, ozone depletion, acid rain, disaster management and mitigation strategies. Concept of sustainability, Sustainable Development Goals (SDGs), environmental ethics, green technology, eco-friendly practices.	6	25

4	Case Studies on Sustainable Development Goals: SDG 1: Clean Water and Sanitation: Case Study: "Jal Shakti Abhiyan" – Government initiative for water conservation in India. Local Study Idea: Audit of water usage in college campus – Students track and report wastage. SDG 2: Affordable and Clean Energy: Case Study: "Charanka Solar Park, Gujarat" – One of Asia's largest solar parks. Practical Activity: Students analyze power usage at home and suggest solar alternatives. SDG 3: Sustainable Cities and Communities: Case Study: "Pune's Waste Segregation Model" – Community-led waste segregation. Local Study Idea: Survey of nearby residential areas for sustainable living practices. SDG 4: Responsible Consumption and Production: Case Study: "Plastic Ban in Sikkim" – First Indian state to ban plastic bottles. In-class Activity: Organize a "No Plastic Day" campaign in college. SDG 5: Life Below Water: Case Study: "Beach Clean-up at Versova, Mumbai" – Community cleanup success story. Activity: Create digital posters or reels on marine pollution using Canva. SDG 6: Life on Land: Case Study: "Chipko Movement" – Historical grassroots forest conservation effort. Activity: Students plant and document the growth of a sapling for 30 days.	6	25
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Course Learning Outcomes (CLO):

At the end of this course, the student would be able

- CLO1:** Understand Environmental Concepts and Identify Environmental Challenges.
- CLO2:** Understand Environmental Concepts and Identify Environmental Challenges.
- CLO3:** Explain The Importance of Biodiversity and Natural Resource Conservation.
- CLO4:** Evaluate The Causes and Consequences of Environmental Pollution.

List of Textbooks:

- Erach Bharucha, Environmental Studies, University Grants Commission, University Press, 2013 ISBN: 9788173719258
- William P. Cunningham, Mary A. Cunningham, Environmental Science: A Global Concern, McGraw-Hill Education, 15th Edition, 2020, ISBN: 9781260570800
- Margaret Robertson, Sustainability Principles and Practice, Routledge, 3rd Edition, 2021, ISBN: 9780367200177
- Purohit, Shammi & Agrawal, Textbook of Environmental Science, Agrobios (India), Revised Edition, 2014 ISBN: 9788177542210
- A. K. Sharma, Sustainable Development: An Introduction, RBSA Publishers, 2015 ISBN: 9788176117167

List of Reference Books:

- Anubha Kaushik & C. P. Kaushik, Perspectives in Environmental Studies, New Age International Publishers, 6th Ed.
- R.Rajagopalan, Environmental Studies: From Crisis to Cure, Oxford University Press, 3rd Ed.
- Daniel D. Chiras, Environmental Science: A Systems Approach to Sustainable Development, Jones & Bartlett

E-Resource / Web Links:

1. <https://nptel.ac.in/courses/120108004>
2. <https://swayam.gov.in/explorer?category=Environmental%20Sciences>
3. <https://www.unep.org/resources>
4. <https://education.nationalgeographic.org/resource/sustainability>
5. <https://www.epa.gov/learn-issues>

Mapping of CLO, PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	H	M	L										H	M	
CLO2	H	H	M	M									H	M	
CLO3	H	M	H	M									M	H	
CLO4	M	H	M	H	M								H	H	

H: High, M: Medium, L: Low