
SUSTAINABLE
DEVELOPMENT
GOALS


17
PARTNERSHIPS
FOR THE GOALS

17.4.1. SPIHER's Commitment to Meaningful Education Around the SDGs

St. Peter's Institute of Higher Education and Research (SPIHER) is deeply committed to embedding the principles of the **United Nations Sustainable Development Goals (SDGs)** throughout its academic and institutional framework. The university believes that meaningful education on the SDGs is essential for cultivating **globally aware, socially responsible, and sustainability-driven graduates** capable of addressing the most pressing global challenges.

SPIHER's approach ensures that the SDGs are integrated across **curricular, co-curricular, research, and community engagement** domains, enabling students to connect theoretical understanding with practical, real-world applications.

1. Incorporating SDGs into the Academic Curriculum

SPIHER has embedded SDG education into the **core curriculum** across all undergraduate and postgraduate programs. Faculty members from diverse disciplines—Engineering, Life Sciences, Social Sciences, Management, and Humanities—strategically integrate SDG themes into their teaching modules, allowing students to develop a holistic understanding of sustainability and global responsibility.

For example:

- **Environmental Science** students engage with **SDG 13 (Climate Action)**, **SDG 14 (Life Below Water)**, and **SDG 15 (Life on Land)** through coursework and field-based studies.
- **Biotechnology and Biochemistry** students study **SDG 3 (Good Health and Well-being)** and **SDG 12 (Responsible Consumption and Production)** through research on sustainable bioprocesses and healthcare innovations.
- **Management students** explore **SDG 8 (Decent Work and Economic Growth)** and **SDG 9 (Industry, Innovation, and Infrastructure)** within the framework of **sustainable business practices** and **corporate social responsibility (CSR)**.

Through this curriculum integration, SPIHER ensures that every student—irrespective of their discipline—develops the competencies needed to contribute effectively to sustainable development goals in their professional and personal lives.

2. Hands-on Learning and Interdisciplinary Approach

SPIHER adopts an **interdisciplinary and experiential learning model** to strengthen students' understanding of the SDGs. By encouraging collaboration across disciplines, students learn to analyze and address complex sustainability issues from multiple perspectives.

- **Project-based learning**, **fieldwork**, and **internships** provide students with practical exposure to SDG implementation in real-world contexts.

- Engineering and Life Sciences students, for instance, collaborate on **clean energy** and **water management projects** related to **SDG 7 (Affordable and Clean Energy)** and **SDG 6 (Clean Water and Sanitation)**.
- Social Sciences students conduct field research on **gender equality (SDG 5)** and **reducing inequalities (SDG 10)**, applying data-driven insights to propose community-based interventions.

Additionally, SPIHER promotes **hands-on community engagement**, where students actively participate in initiatives such as **environmental clean-up drives**, **health awareness campaigns**, **education support programs**, and **rural development projects**—bridging classroom learning with tangible social impact.

3. Co-Curricular Activities and SDG Awareness

SPIHER fosters a vibrant culture of **SDG awareness and action beyond the classroom** through seminars, workshops, debates, and awareness campaigns.

Organizations such as the **National Service Scheme (NSS)** and **Rotaract Club** play a pivotal role by organizing activities like:

- **Tree planting drives**, **beach clean-ups**, and **waste reduction campaigns** (SDG 13 and SDG 14).
- **Blood donation camps** and **health awareness programs** (SDG 3).

The university also hosts **guest lectures and panel discussions** featuring experts from NGOs, government agencies, and industry who share best practices and success stories related to SDG implementation.

Students are encouraged to participate in **national and international SDG conferences, research symposia, and sustainability hackathons**, where they present innovative solutions and network with global peers working toward sustainable development.

4. Research and Innovation for the SDGs

SPIHER actively promotes **research and innovation** that directly contribute to advancing the SDGs. Faculty and students are encouraged to undertake applied research projects through dedicated research centers and laboratories focusing on sustainability, renewable energy, environmental protection, and public health.

Examples include:

- **Biotechnology Department** projects on **bioremediation** and **waste management** (SDG 6 and SDG 12).
- **Environmental Science Department** research on **biodiversity conservation and climate resilience** (SDG 15 and SDG 13).

- **Innovation Labs** supporting projects in **green technology**, **sustainable agriculture**, and **social entrepreneurship**, aligning with multiple SDGs.

These research efforts contribute not only to academic advancement but also to **community empowerment and policy innovation**.

5. Global Partnerships and Collaborations

SPIHER's commitment to SDG education extends to the global arena through strategic partnerships with **international universities, NGOs, and research institutions**.

Through **student exchange programs, joint research projects, and international internships**, SPIHER students gain exposure to **global sustainability practices** and cross-cultural problem-solving.

These collaborations allow students to understand the **interconnectedness of global challenges** and design solutions that have both **local relevance and global impact**.

Evidence of meaningful education around the SDGs

The course Environmental Studies is integrated with all courses, plays a key role in strengthening institutional commitment toward global sustainability efforts, aligning strongly with SDG 17.4.1, which emphasizes educational initiatives that build awareness, enhance capacity, and promote partnerships to achieve the Sustainable Development Goals. By integrating sustainability concepts into academic curricula, the course ensures that students gain the knowledge and skills necessary to participate meaningfully in national and international sustainability efforts.

Environmental Studies fosters interdisciplinary learning by connecting ecology, climate science, waste management, biodiversity conservation, and environmental policies with real-world challenges. Through its modules, the course encourages collaboration with government bodies, NGOs, research institutions, and community organizations, reflecting the spirit of SDG 17—strengthening partnerships at multiple levels.

Practical components such as field visits, community awareness drives, environmental audits, and project-based learning help students engage directly with stakeholders, analyse environmental issues, and propose sustainable solutions. By equipping learners with scientific understanding and responsible environmental attitudes, the course contributes to building a skilled, sustainability-oriented population capable of supporting global environmental partnerships.

Thus, Environmental Studies stands as a vital academic component that advances SDG 17 by promoting knowledge-sharing, collaborative learning, and capacity-building for sustainable development.

SYLLABUS FOR ENVIRONMENTAL STUDIES

24BOU302	ENVIRONMENTAL STUDIES	L	T	P	C	TOTAL MARKS
		2	0	0	2	100

PREREQUISITES: NIL

COURSE OBJECTIVES

The main objectives of this course are to:

1	Understand the concept of the **environment**, its **significance** and the **structure and function of ecosystems**.
2	Understand the concepts of **renewable** and **non-renewable energy sources**, and the **significance of natural resources**.
3	Explain the concept of **biodiversity**, including its **genetic**, **species**, and **ecosystem diversity**, and the **conservation of endangered and endemic species**.
4	Understand the **effects and control measures of various types of pollution** and the **importance of solid waste management**.
5	Understand the **causes, effects, and solutions to environmental issues**, and the **various environmental protection laws**.

UNIT 1:	Environment and Ecosystem	06

Environment – Definition, scope and significance - Public awareness: Ecosystem - concept - structure and function of an ecosystem- producers, consumers and decomposers - Energy flow in the ecosystem - Food chain - Food web - Ecological pyramids - Forest, Grassland, desert and aquatic ecosystem

UNIT 2:	Natural resources	06

Renewable and non-renewable energy sources. Forest resources, water resources, mineral resources, food resources, energy and land resources. Natural resources and associated problems.

UNIT 3:	Biodiversity and its Conservation	06

Introduction to Biodiversity - Definition - genetic, species and ecosystem diversity - Values and uses of biodiversity - biodiversity at global, national (India) and local levels, Endangered and endemic species of India - conservation of biodiversity - Insitu & Exsitu.

UNIT 4:	Environmental Pollution and Management	06

Definition, causes, effects and control measures of air, water, soil, marine, noise and nuclear pollution. Solid waste management and disaster management. Water conservation, rain water, and harvesting and watershed management.

UNIT 5:	Environmental protection	06

Climate change-Global warming, acid rains, ozone layer depletion, nuclear accidents- Environment protection act, wildlife protection act. and forest conservation act.

30 PERIODS

COURSE OUTCOMES	
At the end of this course the students will be able to:	
CO1:	Explain the significance of environment and the types of ecosystems, energy flow in food chains and ecological pyramids.
CO2:	Differentiate the renewable and non-renewable energy sources and various natural resources, and the environmental problems.
CO3:	Explain biodiversity, and its different levels with significance of biodiversity conservation, including methods for conserving endangered and endemic species in India.
CO4:	identify the causes and effects of different types of pollution, propose control measures, and the significance of sustainable practices in solid waste management and disaster management
CO5:	Identify key environmental issues and significance of legal frameworks in protecting the environment, and the role of environmental protection laws.
	TOTAL:30 PERIODS

TEXT BOOKS & REFERENCES	
1.	Bharucha, E. Text Book of environmental Studies for undergraduates, University Press (India) Pvt. Ltd. 2005
2.	RajanMisra, A Text Book on environmental Studies. University Science Press. New Delhi. 2009
3.	Sinha and Saradha , Text Book of Environmental Studies, AITBS Publication. 2005
4.	Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2013
5.	Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers, 2018.
6.	Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
7.	Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication, London, 1998.
8.	Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005

LESSON PLAN

Course Code: 24BOU302 Degree / Branch: B.Sc./Biotechnology
Course Name: **Environmental Studies** Total No. of credits**: 2**
Year / Sem: II/III Tutorial Hours : 6
Faculty Name**:** P.Yogarajalakshmi Lecture Hours : 6

UNIT – 1

Course Objectives: Understand the concept of the environment, its significance, and the structure and function of ecosystems. Understand the concepts of renewable and non-renewable energy sources, and to explore the significance of natural resources

No.	Planned Period(s)	Topics Covered	Blooms Level	SDG	Teaching Technique	Resource	COs	POs	PSOs
1	1	Structure and functions of Ecosystem	K1	13,14, 15	PPT	R1	CO1	1	1
2	1	Producers consumers decomposers	K1	13,14, 15	PPT	T1	CO1	1	0
3	1	Energy flow in the ecosystem	K1	13,14, 15	BB	T1	CO1	1	0
4	1	Food chain - Food web	K1	13,14, 15	PPT	R1	CO1	1	1
5	1	Types of ecosystem Forest, Grassland	K1	13,14, 15	PPT	T1	CO1	1	1
6	1	Desert and aquatic ecosystem	K1	13,14, 15	BB	R1	CO1	1	0

Course Outcome: Explain the scope, significance of environment and the structure, function and types of ecosystems, identify the roles of producers, consumers, and decomposers, and describe energy flow in food chains, food webs, and ecological pyramids

Assessment Component: Assignments, Seminars, Quiz.

UNIT – 2

Course Objectives: Understand the concepts of renewable and non-renewable energy sources, and to explore the significance of natural resources

No.	Planned Period(s)	Topics Covered	Blooms Level	SDG	Teaching Technique	Resource	COs	POs	PSOs
1	1	Renewable and non-renewable energy sources	K2	6,7,12, 15	BB	R1	CO2	1	1
2	1	Forest resources, water resources,	K2	6,7,12, 15	BB	R1	CO2	1	0
3	1	Importance of energy resources	K2	6,7,12, 15	BB	T1	CO2	1	1
4	1	Types of Food resources	K2	6,7,12, 15	PPT	T1	CO2	1	0
5	1	Land resources	K2	6,7,12, 15	BB	T2	CO2	1	1
6	1	Natural resources	K2	6,7,12, 15	BB	T2	CO2	1	0

Course Outcome:

Differentiate the renewable and non-renewable energy sources and identify various natural resources, and analyze the environmental problems caused by their overuse and depletion.

Assessment Component: Assignments, Class tests, Seminars

UNIT – 3

Course Objectives: Explain the concept of biodiversity, including its genetic, species, and ecosystem diversity, and the conservation of endangered and endemic species in India through in-situ and ex-situ methods

No.	Planned Period(s)	Topics Covered	Blooms Level	SDG	Teaching Technique	Resource	COs	POs	PSOs
1	1	Species diversity	K2	13,14 ,15	BB	R1,	CO3	1	1
2	1	biodiversity at global, national (India	K2	13,14 ,15	BB	R1	CO3	1	0
3	2	and endemic species of India	K2	13,14 ,15	PPT	R1	CO3	1	1
4	2	conservation of biodiversity	K2	13,14 ,15	PPT	R1	CO3	1	0

Course Outcome:

Define biodiversity, explain its different levels (genetic, species, and ecosystem), and understand the significance of biodiversity conservation at global

Assessment Component: Assignments, Seminars, Quiz

UNIT – 4

Course Objective: To enable learner to understand the role and mechanism of excretory system.

No.	Planned Period(s)	Topics Covered	Blooms Level	SDG	Teaching Techniqu	Resource	COs	POs	PSOs
1	2	Causes, effects and control measures of air, water	K2	3,6,14 ,15	BB	T1	CO4	1,2	2
2	2	Causes, effects and control measures of Soil	K2	3,6,14 ,15	BB	T1	CO4	2	3
3	1	Causes, effects and control measures of marine pollution	K1	3,6,14 ,15	PPT	T1	CO4	2,3	2,3
4	1	Solid waste management and disaster management.	K1	3,6,14 ,15	PPT	T1	CO4	2	3

Course Outcome:

Identify and analyze the causes and effects of different types of pollution, propose control measures, and the significance of sustainable practices in solid waste management

Assessment Component: Seminar, Assignment, Quiz & MCQs

UNIT – 5

Course Objective: To enable learner to understand the reproductive system in human

No.	Planned Period(s)	Topics Covered	Blooms Level	SDG	Teaching Technique	Resource	COs	POs	PSOs
1	1	Climate change-Global warming	K2	3,13,16, 17	BB	T1	CO5	1,2	2
2	1	acid rains, ozone layer depletion	K2	3,13,16, 17	BB	T1	CO5	2	3
3	2	nuclear accidents- Environment protection act	K1	3,13,16, 17	PPT	T1	CO5	2,3	2,3
4	2	wildlife protection	K1	3,13,16, 17	PPT	T1	CO5	2	3

Course Outcome:

Identify key environmental issues and significance of legal frameworks in protecting the environment, and the role of environmental protection laws

Assessment Component: Seminars, Case Study, Assignments.

TEXT BOOKS & REFERENCES	
1	Bharucha, E. Text Book of environmental Studies for undergraduates, University Press (India) Pvt. Ltd. 2005
2	RajanMisra, A Text Book on environmental Studies. University Science Press. New Delhi. 2009
3	Sinha and Saradha , Text Book of Environmental Studies, AITBS Publication. 2005
4	Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2013
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6	Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
7	Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication, London, 1998.
8	Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005

Sustainable Development Goals (SDG)	Bloom Taxonomy Level	Teaching Techniques	Assessment Components
1. No poverty 2. Zero hunger 3. Good health and well-being 4. Quality education 5. Gender equality 6. Clean water and sanitation 7. Affordable and clean energy 8. Decent work and economicgrowth 9. Industry, innovation andinfrastructure 10. Reduced inequalities 11. Sustainable cities andcommunities 12. Responsible consumption andproduction 13. Climate action 14. Life below water 15. Life on land 16. Peace, justice, and stronginstitutions 17. Partnerships for the goals.	BL1= Remember BL2= Understand BL3=Apply BL4=Analyse BL5= Evaluate BL6= Create	1. Group-Learning and Teaching 2. Individual Learning / Self Study 3. Game Based Learning 4. Technology BasedLearning 5. Peer Teaching 6. Learning through Problem Solving 7. Project Based Learning.	1. Quiz and MCQ 2. Case Study 3. Projects 4. Assignments 5. Seminar Presentations 6. Self Assessments 7. Peer Assessment 8. Assessment of Vocational Skills

CO's to PO's and PSO's Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1:	3	2	2	3	2	2	3	–	2	–	3
CO2:	3	3	–	2	3	–	2	–	3	2	3
CO3:	3	2	2	2	3	2	2	–	2	–	2
CO4:	2	–	–	–	2	3	2	3	3	3	2
CO5:	2	–	–	–	3	3	2	3	3	3	2

The syllabus emphasizes environmental literacy through topics such as ecosystems, biodiversity conservation, pollution control, sustainable resource management, waste reduction, and climate change mitigation. Students are encouraged to relate scientific principles to real-world sustainability issues through field visits, case studies, community outreach, and project-based learning.

The lesson plans prepared by faculty explicitly map each topic or unit to relevant SDGs, ensuring that students not only gain subject-specific knowledge but also understand its broader social, environmental, and ethical implications.

Through this SDG-integrated lesson planning approach:

- Students develop **sustainability literacy**, linking classroom concepts with global challenges.
- Faculty use **context-based teaching methods** such as case studies, seminars, and project-based learning to emphasize SDG-driven outcomes.
- Assessment components, including assignments and presentations, encourage critical reflection on how scientific knowledge contributes to sustainable development.

SPIHER faculty engaged in teaching Environmental Studies

Conclusion:

The institution's commitment to meaningful education around the SDGs reflects a proactive effort to build knowledge, strengthen capacities, and empower learners to become responsible global citizens. By integrating SDG concepts into academic curricula, value-added courses, seminars, and community-focused educational activities, the institution ensures that students, faculty, and stakeholders develop a deep understanding of global challenges and sustainable development pathways.

Through collaborative platforms, expert talks, and interdisciplinary learning opportunities, the institution actively promotes knowledge sharing and fosters partnerships that amplify collective impact aligning fully with SDG 17.4.1. These efforts not only enhance the quality of education but also create a culture of sustainability, innovation, and social responsibility. Ultimately, this commitment strengthens institutional capacity, prepares students for real-world problem solving, and contributes to achieving the SDGs at local, national, and global levels.