



## RabindraBharati University

*Syllabus for Interdisciplinary Course in Environmental Science/ Studies for undergraduate level  
Session 2023-24 onwards*

The salient features of this course are as follows:

✓ To be covered in one semester

✓ Total credits of the Course = 3\*

\*As per UGC Curriculum and Credit Framework for Undergraduate Programmes(  
<https://www.ugc.ac.in/e-book/FYUGP/mobile/index.html>), a one credit of tutorial work means one-hour engagement per week.

✓ In a semester of 15 weeks duration, a one credit tutorial in a course is equivalent to 15 hours of engagement. Thus, this course is equivalent to 45 hours of engagement.

✓ The syllabus of this course is in keeping with the National Education Policy 2020.

Unit	Syllabus for course curriculum	Hours	Marks
1	<b><i>Society and Environment, Social Theories, Sociology of Development and the Environment</i></b> <ul style="list-style-type: none"><li>Views of Rabindranath Tagore and other Indian thinkers on environment and society</li><li>Concept of growth and development, antidevelopment and maldevelopment</li><li>Indicators of economic development</li><li>Development induced displacement</li></ul>	7	40 + 10 = 50
2	<b><i>Environmental Communication</i></b> <ul style="list-style-type: none"><li>Need and strategies of environmental communication</li><li>Public awareness development through environmental communication</li><li>Modes of environmental communication</li><li>Important environmental awareness programs in India</li></ul>	6	
3	<b><i>Environment and Resource Economics</i></b> <ul style="list-style-type: none"><li>Natural resources and associated problems</li><li>Water resources and national status</li><li>Mineral resources and national status</li><li>Land resources and national status</li><li>Food resources and national status</li></ul>	8	

	<ul style="list-style-type: none"> <li>• Energy resources and national status</li> </ul>		
4	<p><b><i>Technology, Environment and Society</i></b></p> <ul style="list-style-type: none"> <li>• Environmental Biotechnology</li> <li>• Wastewater treatment</li> <li>• Solid waste management, Alternative fuels</li> <li>• Integrated Pest Management (IPM)</li> </ul>	8	
5	<p><b><i>Environmental Management System</i></b></p> <ul style="list-style-type: none"> <li>• Approaches, components and objectives of Environmental Management</li> <li>• Environmental Impact Assessment</li> <li>• Environmental audit</li> <li>• Environmental Management Plan</li> <li>• ISO 14001</li> <li>• Cost-benefit analysis</li> </ul>	8	
6	<p><b><i>Disaster Management in relation to society and environment</i></b></p> <ul style="list-style-type: none"> <li>• Stages of disaster management</li> <li>• Disaster induced displacement</li> <li>• Disaster management cycle</li> <li>• Some natural disasters and its management strategies (e.g. flood, earthquake, cyclone etc.)</li> <li>• Anthropogenic disaster management</li> <li>• National disaster management policy with legislation</li> </ul>	8	



## Rabindra Bharati University

*Syllabus for Interdisciplinary Course in **Global Environment & Health** for undergraduate level  
Session 2023-24 onwards*

The salient features of this course are as follows:

✓ To be covered in one semester

✓ Total credits of the Course = 3\*

\*As per UGC Curriculum and Credit Framework for Undergraduate Programmes (<https://www.ugc.ac.in/e-book/FYUGP/mobile/index.html>), a one credit of tutorial work means one-hour engagement per week.

✓ In a semester of 15 weeks duration, a one credit tutorial in a course is equivalent to 15 hours of engagement. Thus, this course is equivalent to 45 hours of engagement.

✓ The syllabus of this course is in keeping with the National Education Policy 2020.

Unit No.	Syllabus for Global Environment & Health course curriculum	Hours	Marks
I	<b>Gender and the Environment</b> <ul style="list-style-type: none"><li>• Gender equality and environmental sustainability;</li><li>• Global environmental frameworks including gender;</li><li>• Gender equality in Millenium Development Goals and Sustainable Development Goals;</li><li>• Gender equality and women's empowerment in biodiversity, climate change, land degradation, international waters, disasters and pollution scenarios.</li></ul>	7	40 + 10 = 50
	II		
III		<b>Global Environmental Issues</b> <ul style="list-style-type: none"><li>• Environmental issues like global warming, climate change, natural disasters, pollution, vector borne disease etc;</li><li>• Impacts of anthropogenic activities; environmental pollution related health issues</li><li>• Available global and national policies for such issues;</li><li>• Potential solutions for each issue.</li></ul>	

<b>IV</b>	<b>Natural Resources and Conflicts</b>	<b>7</b>	
	<ul style="list-style-type: none"> <li>• Classification of natural resources;</li> <li>• National status of different natural resources;</li> <li>• Threats to natural resources;</li> <li>• Trans-boundary conflicts over natural resources at national and international levels (case studies);</li> <li>• Conservation of natural resources.</li> </ul>		
<b>V</b>	<b>Environmental Ethics and Environmental Philosophy</b>	<b>8</b>	
	<ul style="list-style-type: none"> <li>• Existence and nature of intrinsic value;</li> <li>• Animal ethics;</li> <li>• The deep ecology/social ecology debate;</li> <li>• Eco-feminism;</li> <li>• Environmental ethics approaches and world views (utilitarian conservation through bio-centric preservation);</li> <li>• Environmental justice.</li> </ul>		
<b>VI</b>	<b>Environmental Policies and Politics</b>	<b>7</b>	
	<ul style="list-style-type: none"> <li>• Introduction to the environmental institutions;</li> <li>• Major summits and conferences;</li> <li>• Environmental issues for North vs. South debate;</li> <li>• Environmental laws and acts</li> <li>• Role of courts, NGOs and Pollution Control Boards in environmental protection</li> <li>• Environmental policies of our country.</li> </ul>		



## RabindraBharati University

### *Syllabus for Interdisciplinary Course in Sustainable Development* for undergraduate level Session 2023-24 onwards

The salient features of this course are as follows:

✓ To be covered in one semester

✓ Total credits of the Course = 3\*

\*As per UGC Curriculum and Credit Framework for Undergraduate Programmes(<https://www.ugc.ac.in/e-book/FYUGP/mobile/index.html>), a one credit of tutorial work means one-hour engagement per week.

✓ In a semester of 15 weeks duration, a one credit tutorial in a course is equivalent to 15 hours of engagement. Thus, this course is equivalent to 45 hours of engagement.

✓ The syllabus of this course is in keeping with the National Education Policy 2020.

Unit	Syllabus for course curriculum	Hours	Marks
1	<b><i>Sustainable Development – environmental, economic and social features</i></b> <ul style="list-style-type: none"><li>• Meaning of sustainability, development and sustainable development</li><li>• Objectives of sustainable development</li><li>• Origin and evolution of sustainable development</li><li>• Indicators of sustainable development</li></ul>	8	40+10 = 50
2	<b><i>Human communities and environment – traditional knowledge</i></b> <ul style="list-style-type: none"><li>• Sustainable resource management</li><li>• Biodiversity conservation</li><li>• Ecological adaptation and resilience</li><li>• Cultural and spiritual significance</li></ul>	7	
3	<b><i>Socio-cultural aspects of environmental protection and sustainability</i></b> <ul style="list-style-type: none"><li>• Cultural values and beliefs</li><li>• Education and awareness</li><li>• Social norms and behaviors</li><li>• Community engagement and participation</li><li>• Environmental justice</li></ul>	7	
4	<b><i>The Pillars of Sustainability</i></b>	8	

	<ul style="list-style-type: none"> <li>• Goals of sustainable development</li> <li>• Agenda 21</li> <li>• Millennium Development Goals (MDGs)</li> <li>• Sustainable Development Goals (SDGs)</li> <li>• Agenda 21 implementation in India</li> </ul>		
5	<p><b><i>The 2030 Agenda</i></b></p> <ul style="list-style-type: none"> <li>• Integrated approaches of SDGs</li> <li>• Global partnership</li> <li>• Means of implementation i.e. technology transfer, capacity building, and institutional support</li> <li>• Time-bound targets</li> </ul>	8	
6	<p><b><i>SDG2030 and beyond</i></b></p> <ul style="list-style-type: none"> <li>• Climate change and environmental sustainability</li> <li>• Digital transformation and technological advancement</li> <li>• Peace, security, and governance</li> <li>• Strengthening of global partnerships and cooperation</li> <li>• Framework for the post-2030 development agenda</li> </ul>	7	



## **Rabindra Bharati University**

Syllabus for *Value Added Course in Environmental Education* for undergraduate level

Session 2023-24 onwards

The salient features of this course are as follows:

✓ Total credits of the Course = 4\*

\*As per UGC Curriculum and Credit Framework for Undergraduate Programmes (<https://www.ugc.ac.in/e-book/FYUGP/mobile/index.html>), a one credit of tutorial work means one-hour engagement per week.

✓ In a semester of 15 weeks duration, a one credit tutorial in a course is equivalent to 15 hours of engagement. A one credit course in practicum or lab work, community engagement and services, and field work in a semester means two-hour engagement per week. In a semester of

15 weeks duration, a one credit practicum in a course is equivalent to 30 hours of engagement.

✓ The course is distributed over semesters I, and II in a manner that will facilitate the students to meet the minimum credit requirements.

The structure of the course will be as follows:

First Semester: 4 Units of total 2 credits.

Second Semester: 4 Units of total 2 credits.

The syllabus of this course is in keeping with the National Education Policy 2020.



## Rabindra Bharati University

Syllabus for *Value Added Course in Environmental Education* for undergraduate level

Session 2023-24 onwards

Semester	Unit No.	Course name	Credits	Teaching Hours
I	I	Humans and the Environment	2	7
	II	Natural Resources and Sustainable Development		8
	III	Environmental Issues: Local, Regional and Global		8
	IV	Conservation of Biodiversity and Ecosystems		7
II	V	Environmental Pollution and Health	2	8
	VI	Climate Change: Impacts, Adaptation and Mitigation		7
	VII	Environmental Management		8
	VIII	Environmental Treaties and Legislation		7
<b>Total</b>			<b>4</b>	<b>60</b>



## Semester I

Unit No.	Syllabus for Environmental Education course curriculum	Marks
<b>I</b>	<p><b>Humans and the Environment</b></p> <ul style="list-style-type: none"> <li>• The man-environment interaction: Humans as hunter-gatherers; Mastery of fire; Origin of agriculture;</li> <li>• Emergence of city-states; Great ancient civilizations and the environment, Indic Knowledge and Culture of sustainability; Middle Ages and Renaissance; Industrial revolution and its impact on the environment;</li> <li>• Population growth and natural resource exploitation; Global environmental change.</li> <li>• Environmental Ethics and emergence of environmentalism: Anthropocentric and eco-centric perspectives (Major thinkers); The Club of Rome- Limits to Growth; UN Conference on Human Environment 1972;</li> <li>• World Commission on Environment and Development and the concept of sustainable development; Rio Summit and subsequent international efforts.</li> </ul>	40 + 10 =50
<b>II</b>	<p><b>Natural Resources and Sustainable Development</b></p> <ul style="list-style-type: none"> <li>• Overview of natural resources: Definition of resource; Classification of natural resources- biotic and abiotic, renewable and non-renewable.</li> <li>• Biotic resources: Major type of biotic resources- forests, grasslands, wetlands, wildlife and aquatic (fresh water and marine); Microbes as a resource; Status and challenges.</li> <li>• Water resources: Types of water resources- fresh water and marine resources; Availability and use of water resources; Environmental impact of over-exploitation, issues and challenges; Water scarcity and stress; Conflicts over water.</li> <li>• Soil and mineral resources: Important minerals; Mineral exploitation; Environmental problems due to extraction of minerals and use; Soil as a resource and its degradation.</li> <li>• Energy resources: Sources of energy and their classification, renewable and non-renewable sources of energy; Conventional energy sources- coal, oil, natural gas, nuclear energy; Non-conventional energy sources- solar, wind, tidal, hydro, wave, ocean thermal, geothermal, biomass, hydrogen and fuel cells;</li> <li>• Implications of energy use on the environment.</li> <li>• Introduction to sustainable development: Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs.</li> </ul>	
<b>III</b>	<p><b>Environmental Issues: Local, Regional and Global</b></p> <ul style="list-style-type: none"> <li>• Environmental issues and scales: Concepts of micro-, meso-, synoptic and planetary scales; Temporal and spatial extents of local, regional, and global phenomena.</li> <li>• Pollution: Impact of sectoral processes on Environment; Types of Pollution- air,</li> </ul>	

	<p>noise, water, soil, thermal, radioactive ;municipal solid waste, hazardous waste; transboundary air pollution; acid rain; smog.</p> <ul style="list-style-type: none"> <li>• Land use and Land cover change: land degradation, deforestation, desertification, urbanization.</li> <li>• Biodiversity loss: past and current trends, impact.</li> <li>• Global change: Ozone layer depletion; Climate change. Disasters – Natural and Man-made (Anthropogenic).</li> </ul>	
<b>IV</b>	<p><b>Conservation of Biodiversity and Ecosystems</b></p> <ul style="list-style-type: none"> <li>• Biodiversity and its distribution: Biodiversity as a natural resource; Levels and types of biodiversity;</li> <li>• Biodiversity in India and the world; Biodiversity hotspots; Species and ecosystem threat categories.</li> <li>• Ecosystems and ecosystem services: Major ecosystem types in India and their basic characteristics forests, wetlands, grasslands, agriculture, coastal and marine; Ecosystem services- classification and their significance.</li> <li>• Threats to biodiversity and ecosystems: Land use and land cover change; Commercial exploitation of species; Invasive species; Fire, disasters and climate change.</li> <li>• Major conservation policies: in-situ and ex-situ conservation approaches; Major protected areas;</li> <li>• National and International Instruments for biodiversity conservation; the role of traditional knowledge, community-based conservation; Gender and conservation.</li> </ul>	

## Semester II

Unit No.	Syllabus for Environmental Education course curriculum	Marks
<b>V</b>	<p><b>Environmental Pollution and Health</b></p> <ul style="list-style-type: none"> <li>• Understanding pollution: Production processes and generation of wastes; Assimilative capacity of the environment; Definition of pollution; Point sources and non-point sources of pollution.</li> <li>• Air pollution: Sources of air pollution; Primary and secondary pollutants; Criteria pollutants- carbon monoxide, lead, nitrogen oxides, ground-level ozone, particulate matter and sulphur dioxide; Other important air pollutants- Volatile Organic compounds (VOCs), Peroxyacetyl Nitrate (PAN), Polycyclic aromatic hydrocarbons (PAHs) and Persistent organic pollutants (POPs); Indoor air pollution; Adverse health impacts of air pollutants; National Ambient Air Quality Standards.</li> <li>• Water pollution: Sources of water pollution; River, lake and marine pollution, groundwater pollution; water quality Water quality parameters and standards; adverse health impacts of water pollution on human and aquatic life.</li> <li>• Soil pollution and solid waste: Soil pollutants and their sources; Solid and hazardous waste; Impact on human health.</li> <li>• Noise pollution: Definition of noise; Unit of measurement of noise pollution; Sources of noise pollution; Noise standards; adverse impacts of noise on human health.</li> <li>• Thermal and Radioactive pollution: Sources and impact on human health and ecosystems.</li> </ul>	40 + 10 =50
<b>VI</b>	<p><b>Climate Change: Impacts, Adaptation and Mitigation</b></p> <ul style="list-style-type: none"> <li>• Understanding climate change: Natural variations in climate; Structure of atmosphere; Anthropogenic climate change from greenhouse gas emissions– past, present and future; Projections of global climate change with special reference to temperature, rainfall, climate variability and extreme events;</li> <li>• Importance of 1.5 °C and 2.0 °C limits to global warming; Climate change projections for the Indian sub-continent.</li> <li>• Impacts, vulnerability and adaptation to climate change: 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; the concept of vulnerability and its assessment; Adaptation vs. resilience; Climate-resilient development; Indigenous knowledge for adaptation to climate change.</li> <li>• Mitigation of climate change: Synergies between adaptation and mitigation measures; Green House Gas (GHG) reduction vs. sink enhancement; Concept of carbon intensity, energy intensity and carbon neutrality; National and international policy instruments for mitigation, decarbonizing pathways and net zero targets for the future; Energy efficiency measures; Renewable energy sources; Carbon capture and storage, National climate action plan and Intended Nationally</li> </ul>	

	<p>Determined Contributions (INDCs);</p> <ul style="list-style-type: none"> <li>• Climate justice.</li> </ul>	
<b>VII</b>	<p><b>Environmental Management</b></p> <ul style="list-style-type: none"> <li>• Introduction to environmental laws and regulation: Constitutional provisions- Article 48A, Article 51A (g) and other derived environmental rights; Introduction to environmental legislations on the forest, wildlife and pollution control.</li> <li>• Environmental management system: ISO 14001</li> <li>• Concept of Circular Economy, Life cycle analysis; Cost-benefit analysis</li> <li>• Environmental audit and impact assessment; Environmental risk assessment Pollution control and management; Waste Management- Concept of 3R (Reduce, Recycle and Reuse) and sustainability;</li> <li>• Ecolabeling /Ecomark scheme.</li> </ul>	
<b>VIII</b>	<p><b>Environmental Treaties and Legislation</b></p> <ul style="list-style-type: none"> <li>• An overview of instruments of international cooperation; bilateral and multilateral agreements; conventions and protocols; adoption, signature, ratification and entry into force; binding and nonbinding measures; Conference of the Parties (COP);</li> <li>• Major International Environmental Agreements: Convention on Biological Diversity (CBD); Cartagena Protocol on Biosafety; Nagoya Protocol on Access and Benefit-sharing; Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES); Ramsar Convention on Wetlands of International Importance; United Nations Convention to Combat Desertification (UNCCD); Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol on Substances that Deplete the Ozone Layer and the Kigali Amendment; Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants; Minamata Convention on Mercury; United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; Paris Agreement; India's status as a party to major conventions;</li> <li>• Major Indian Environmental Legislations: The Wild Life (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Forest (Conservation) Act, 1980; The Air (Prevention and Control of Pollution) Act, 1981; The Environment (Protection) Act, 1986; The Biological Diversity Act, 2002; The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Noise Pollution (Regulation and Control) Rules, 2000;</li> <li>• Industry-specific environmental standards;</li> <li>• Waste management rules; Ramsar sites; Biosphere reserves; Protected Areas; Ecologically Sensitive Areas; Coastal Regulation Zone; Status phase-out of production and consumption of Ozone Depleting Substances by India; National Green Tribunal;</li> </ul>	

	<ul style="list-style-type: none"> <li>• Some landmark Supreme Court judgements</li> <li>• Major International organisations and initiatives: United Nations Environment Programme (UNEP),</li> <li>• International Union for Conservation of Nature (IUCN), World Commission on Environment and Development (WCED), United Nations Educational, Scientific and Cultural Organization (UNESCO), Intergovernmental Panel on Climate Change (IPCC), and Man and the Biosphere (MAB) programme.</li> </ul>	
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#### Suggested readings

- Textbook of Environmental Studies, Erach Bharucha
- Fundamentals Of Environmental Studies, Mahua Basu, S. Xavier
- Environmental Studies, Rajarshi Mitra, Moumit Roy Goswami
- *Paribesh*, Dr. Anish Chattopadhyay
- Introduction To Environment Studies – Dr. K. K. Garg and Dr. D. K. Soni
- Environmental Law In India, P Leelakrishnan
- Environmental Sustainability, Utkarsh Sharma
- Environmental Chemistry, Anil K. De
- Basics Of Environment Management, Parvin Khandve
- Environmental Science, S. C. Santra
- Fundamentals of Ecology, E Odum
- Climate change, disaster management and environment, Alka Chauhan.

