

CENTRE FOR FUTURES STUDIES

**Post Graduate Diploma in Sustainable Social Development
Syllabus**

The Gandhigram Rural Institute - Deemed to be University Gandhigram

Ministry of Education, Government of India

Accredited by NAAC with 'A' Grade (3rd Cycle)

Dindigul District

Tamil Nadu

CENTRE FOR FUTURES STUDIES
THE GANDHIGRAM RURAL INSTITUTE- DEEMED TO BE UNIVERSITY
GANDHIGRAM-624 302
TEMPLATE FOR OBE ELEMENTS

Name : **Dr. K. Velumani**
Designation : **Professor & Director**
Department/Centre : **Centre for Futures Studies**
Academic Programme offered : **P.G. Diploma in Sustainable Social Development**

OBE Elements for **Post Graduate Diploma in Sustainable Social Development**

Programme Educational Objectives (PEO)

After successful completion of the program, the graduates will be

- PEO 1:** Able to contribute to society as broadly educated, expressive, ethical and responsible citizens with proven expertise
- PEO 2:** Able to achieve peer-recognition; as an individual or in a team; through demonstration of good analytical, design and implementation skills.
- PEO 3:** Able to thrive to pursue life-long learning to fulfill their goals
- PEO 4:** Able to become successful professionals in government, academia, research, entrepreneurial pursuit and consulting firms.

PROGRAMME OUTCOME (PO)

The PG Diploma Graduates will be able to

- PO 1:** Gain Analytical skills in the field of Sustainable Social Development.
- PO 2:** Understand and appreciate professional ethics, community living and Nation building activities.
- PO 3:** Evaluate sustainability issues and solutions using a holistic approach that focuses on connections between complex human and natural systems
- PO 4:** Integrate knowledge from multiple sources and perspectives to understand environmental limits governing human societies and economies and social justice dimensions of sustainability.
- PO 5:** Cultivate awareness of the capacity to critique contemporary globalization in terms of sustainability and Become Knowledgeable in the Subject of Sustainable Social Development and apply the principles of the same to the needs of the Society.

PROGRAMME SPECIFIC OUTCOME (PSO)

At the end of the program, the student

- PSO 1:** Should be able to apply the Knowledge of Sustainable Development in the domain of social, cultural, ecological and global levels.
- PSO 2:** Should be able to solve the complex problems in the field of Sustainable Social Development with an understanding of the societal, legal and cultural impacts of the solution.
- PSO 3:** Should be able to explore the synergies and tradeoffs between the approaches to sustainable development and sustainable livelihoods and able to critically analyze specific rural, urban and tribal developmental needs.
- PSO 4:** Should be able to investigate how specific policies, programs or practices can be used to address real-world health issues at the individual, social, cultural, ecological and/or global levels.
- PSO 5:** Should be able to understand the role of the earth sciences in helping to solve societal problems related to natural resources, natural hazards, energy, environment and global climate.

Post Graduate Diploma in Sustainable Social Development

Semester	Category	Course Code	Title of the Course	Credit	Evaluation		Total Marks
					CFA	ESE	
I	Core Course	24CFSP0101	Introduction to Sustainable Development	4	40	60	100
		24CFSP0102	Dynamics of Development	4	40	60	100
		24CFSP0103	Environmental Health	4	40	60	100
		24CFSP0104	Population and Social Development	4	40	60	100
		24CFSP0105	Field Visit	4	100		100
Total				20			500
II	Core Course	24CFSP0206	Solid Waste Management	4	40	60	100
		24CFSP0207	Natural Resources and its Management	4	40	60	100
		24CFSP0208	Gender and Environmental Management	4	40	60	100
		24CFSP0209	Future of Green Technologies	4	40	60	100
		24CFSP0210	Dissertation	8	(150+50)		200
	Total				24		
Grand Total				44			1100

PAPER I: INTRODUCTION TO SUSTAINABLE DEVELOPMENT

UNIT	Content	No. of Hours
	<p>Objectives:</p> <ul style="list-style-type: none"> • To understand the environmental, socio-economic dimensions of sustainability and the principles evolved through landmark events • To develop an action mindset for sustainable development • To provide information about strategies and dynamics of sustainable development • To understand the analysis methods of natural resources to attain sustainable development 	60
I	<p>Sustainable Development : Definition - History and Emergence of the Concept of Sustainable Development - Principles and Frame Work : Stockholm to Rio plus 20 - Rio Principles of Sustainable Development : Prevention - Precautionary - Polluter Pays Principle</p>	12
II	<p>Dimensions and Challenges : Dimensions of Sustainable Development - Environmental - Economic Cultural and Social dimensions – Role of Civil Society - Business and Government - Challenges –Population, Agriculture and Food Security – Global Warming - Climate Change - Responses to Sustainable Development Challenges</p>	13
III	<p>Sustainable Livelihood: Sustainable Livelihood - Quality of Life - Indicators - Targets – Minimalism – Green Infrastructure - Status and Intervention Areas - Demographic Dynamics of Sustainability - Strategies to end Rural and Urban Poverty and Hunger</p>	10
IV	<p>Sustainable Socio-Economic Systems: Sustainable Socio-Economic Systems - Protecting and Promoting Human Health - Urbanization and Sustainable Habitats - Sustainable Production and Consumption - Sustainable Mining - Sustainable Energy - Climate Change - Safeguarding Marine Resources</p>	12
V	<p>Assessing Progress and Way Forward: Sustainability in Regional National and Global Context - Approaches to measuring and analyzing sustainability - limitations of GDP - Ecological Footprint - Human Development Index- Human Development Report – Happiness Index – Localization of Sustainable Development Goals - National Initiatives for Sustainable Development</p>	13

Course Outcomes:	Students will be able CO1 - To develop a fair understanding of the socio-economic and ecological linkage of human production and consumption CO2 - To learn to integrate the Rio principles of sustainable development in decision making and contribute towards Green Economy CO3 - To understand the effects of poverty, population and life of indigenous people on sustainable livelihood CO4 - To study about ecosystem and protection of natural resources to develop sustainable socio-economic systems CO5 - To provide the strategies for sustainable development based on the analysis of natural resources and ecological footprint
Reference	<ol style="list-style-type: none"> 1. Barry Dalal Clayton and Stephen Bass, Sustainable Development Strategies- a resource book”, Earthscan Publications Ltd, London, 2002. 2. Karel Mulder, Sustainable Development for Engineers - A Handbook and Resource Guide, Green Leaf Publishing, 2006. 3. MoEF “ Sustainable Development in India –stocktaking in the Run up to Rio plus 20”, Ministry of Environment and Forests, Government of India, New Delhi. 2012, 4. UNEP, , Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, www.unep.org/greeneconomy, ISBN: 978-92-807-3143-9, 2011 5. World Bank “Inclusive Green Growth – The pathway to Sustainable development, World Bank- Washington DC, 2012

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	3	2	3	2	3	2
CO2	2	3	3	3	2	2	1	2	3	3
CO3	3	2	3	3	3	2	2	3	3	3
CO4	2	3	3	2	1	2	3	3	3	3
CO5	3	3	3	3	3	3	2	3	3	3

PAPER II: DYNAMICS OF DEVELOPMENT

UNIT	CONTENT	No. of Hours
	<p>Objectives:</p> <ul style="list-style-type: none"> ➤ To enable students to understand about rural, urban and tribal development ➤ To equip students with specific skill and techniques of working with rural, urban and tribal communities ➤ To explain students the significance of implementing rural development programmes ➤ To studying the nature if different tribal organization, their backwardness and development policies and programmes ➤ To understand the Rural and Urban community and its alignment with current development paradigm 	60
I	<p>Concept of Development: Objectives and Indicators - Development to Social Development; Types of development – Importance of development - Sustainable Development - Socio Cultural Sustainability; Critique of Development - Theories and Paths of Development – Government Initiatives for Development</p>	12
II	<p>Rural Development: Rural Development - Concept Approaches and Strategies for Rural Reconstruction - Gandhian Community Development Programme - Current programmes for Rural Development - Role of Cooperatives in Rural Development - Problems in Rural Development : Poverty, Housing, Health, Sanitation & Education - Programmes & Schemes of Rural Development under Five Years Plan</p>	12
III	<p>Urban Development: Urbanism and Urbanization - Urban planning - Concept - History and Methods - Urban Policies and Urban Development - Current Programmes for Urban Development - Role of Cooperatives in Urban Development - Problems in Urban Development : Poverty, Housing, Health, Sanitation & Education - Programmes & Schemes of Urban Development under Five Years Plan</p>	12
IV	<p>Tribal Development: Concepts and Approaches - Tribal development and the constitution - Tribal Development Policies and Plans in India - Tribes and their Rights - Patterns and Trends of Development among Tribes - Changes in Socio-Cultural and Economic Front - Level of Social Change among Tribal Women</p>	12
V	<p>Community Participation in Development: Models of Community Participation – Importance of Community Engagement - Community Program Planning - Understanding various Schemes related to Social Security - Corporate Responsibility Movement - Appropriate Technology Movement - Environmental Groups and Citizen Groups - Role played by NGOs</p>	12

Course Outcomes	Students will be able CO1 - To apply their knowledge to independently identify rural, urban and tribal issues CO2 - To critically analyze specific rural, urban and tribal developmental needs CO3 - To form a viewpoint over various contemporary rural development programmes in understanding their significance in national economy. CO4 - To conceptualize various challenges of rural and urban community and strategies to deal with it. CO5 - To analyze the role of national level policies for welfare of rural and urban community
Reference	1. Bulmer, M. et. al.: The Goals of Social Policy. 2. Chakraborti, S.: Development Planning Indian Experience. 3. Dimitto, D.M.: Social Welfare: Politics and Public Policy. 4. Ghosh, A.: Planning in India: The challenges for the Nineties. 5. Miri, Mirinal: tribal Development in India. 6. Rao, D.B.: World Summit for Social Development 7. Dreze, J. and A. Sen (2006): India: Development and Participation, OUP, New Delhi, Ch. 9.

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	3	3	3	3	3	3
CO2	1	2	3	3	3	3	3	3	3	3
CO3	2	3	3	3	3	3	3	3	2	2
CO4	2	3	3	3	2	3	3	3	3	3
CO5	2	3	3	3	2	2	3	3	3	2

PAPER III: ENVIRONMENTAL HEALTH

UNIT	CONTENT	No. of Hours
	<p>Objectives</p> <ul style="list-style-type: none"> • To introduce students about the concepts needed to understand the interactions between human activities, changes in environment and human health • To analyze Environmental hazards that affect human health including Air pollution, water and chemical hazards • To provide an insight of global environmental changes in terms of causes and their implications of Human health 	60
I	<p>Concepts and Components - Environment - Definition - Concept - Integral Components - Ecology - Ecosystem & Habitat - Environmental Resources: Land (Agriculture) - Water - Fisheries - Stakeholders of Environment</p>	10
II	<p>Environmental Issues - Environmental Degradation & Pollution – Types : Air, Water, Soil, Noise and Radioactive - Causes and Effects – Pollution Control - Solid Wastes and Hazardous Wastes - Waste Management (Concept of 3 R) - Impacts on environment</p>	10
III	<p>Environmental Health Issues : Fundamentals of Environmental Health - Environmental Health in Recreational Areas – Borne Diseases : Air – Water – Soil and Vector – Cases Studies : London Smog – Bhopal Gas Tragedy – Minamata Tragedy - Metal Contamination of Soils - Chernobyl Disaster - Environment & Health Impact Assessment – Concept - Steps and Application</p>	15
IV	<p>Hazards and Environmental Health : Types of Environmental Hazards : Physical - Chemical - Biological - Cultural - Components of Environmental Health – Environmental Sanitation - Water Sanitation - Food Hygiene and Safety - Environmental Hazards and Impact on Health - Health Education - School Health Services - Sanitation of Markets and Business Premises - Prevention and Control of Communicable Diseases</p>	15
V	<p>Environmental Health Development : Rights Based Approach for Development and Health - Societal Health & Development - Role of clean air in healthy living - Food Safety and Food Quality on Human Health Outcomes - Health policies - National Rural Health Mission - National Environment Policy - National Water Policy</p>	10

Course Outcomes	<p>Students will be able</p> <p>CO1 - To acquire knowledge about equity and sustainability as central principles in environmental health risk management.</p> <p>CO2 - To elaborate the Personal contributions to environmental degradation and their potential health consequences</p> <p>CO3 - To promote development without causing harm to the environment and make use of environmentally friendly practices.</p> <p>CO4 - To explain Equity and sustainability as central principles in Environmental health risk management.</p> <p>CO5 - To improve ability to access fundamental interactions between the environment sustainable development and public health.</p>
Reference	<ol style="list-style-type: none"> 1. Environmental and Health Impact Assessment of Development Projects: A edited by Robert G. H. Turnbull, Elsevier Sciences Publication 2. Environmental Chemistry, B.K.Sharma, Krishna Prakashan Media. 3. Environmental Science by S C Santra, Publisher: : New Central Book Agency Calcutta , 2001 4. Perspectives in Environmental Health -Vector and Water Borne Diseases Mukhopadhyay Aniruddha, De A K 5. Sociology Anthropology, and Development, Michael M. Cernea, The World Bank Washington, D.C, 1994 6. Development and the Environment, Lewis T. Preston, The World Bank Washington, D.C, 1992

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	3	2	3	3	3	3	3
CO2	3	3	3	1	3	3	3	2	3	3
CO3	2	3	3	3	3	3	3	3	3	3
CO4	1	3	3	3	2	3	3	3	2	2
CO5	2	3	3	3	3	3	3	2	3	3

PAPER IV: POPULATION AND SOCIAL DEVELOPMENT

UNIT	CONTENT	No. of Hours
	<p>Objectives</p> <ul style="list-style-type: none"> ➤ To understand how population is related to its sociological determinants and consequences. ➤ To understand the relationship between population and issues such as urbanization, population aging and health, and environment. ➤ To introduce the students to the general theories of population, including theories of fertility, marriage, mortality and migration ➤ To explain the reason for population growth and replacement and the effect that these changes have on both economical and social distribution 	60
I	<p>Population Studies : Types - Nature and Scope - Difference and Similarities between Demography and Population Studies - Methods of Demographic Data Collection: Primary and Secondary sources of Data Collection - Procedures – Uses</p>	10
II	<p>Population Composition: Sex Composition - Factors affecting Sex composition - Age Structure Population pyramids - Impact of Various Demographic Processes on the Age Structure. Comparison - Developed and Developing Countries</p>	12
III	<p>Population Growth and Problems: Population Growth - Reasons for sudden growth in Population - Population Growth and related problems - Doubling Time - Person years lived, Crude and Specific Rates - Standardization - Direct and Indirect Methods – Measurement</p>	13
IV	<p>Society and Processes of Social Change: Societies; Types and Characteristics- Tribal, Rural, Urban, Industrial and Post-Industrial - Social Change: Concept, Forms and Factors; Concept and Features of Development - Social Change in Contemporary India: Trends and Processes of Change</p>	10
V	<p>Social Development : Social Groups & Processes: Definition, Nature and types of Groups- Primary Secondary & Reference Group; Processes- Co-operation, Conflict and Accommodation - Development Programmes in India: Development Programme in India; The Five Year Plans, Community Development Programme, Panchayat Raj; Impact of new Panchayati Raj on Women Empowerment</p>	15

Course Outcomes	<p>Students will be able</p> <p>CO1 - To understand the basics of population studies</p> <p>CO2 - To develop a positive and pleasing personality, adopt problem solving tools and make informed decisions.</p> <p>CO3 - To understand the core social demographic variables, and how these variables influence population growth, composition, and structure</p> <p>CO4 - To understand the process of social change</p> <p>CO5 - To identify the initiatives taken by government for social development</p>
Reference	<ol style="list-style-type: none"> 1. Principles of population Studies: Asha Bhende and Tara Kanitkar, Himalaya Pub, Houses, Mumbai, 1996 2. Population: John Weeks, Wordsworth pub., California, USA,1994. 3. Population Transition In India: S.N.Singh, M.K.Premi, P.S.Bhatia, B.R.Publishing Corporation, Delhi, 1989. 4. Population in the context of India's development: P.B. Desai UGC – UNFPA project, Ahmedabad, 1987. 5. Demographic Diversity of India, Ashish Bose, B.R. Publishing Corporation, Delhi, July 1991 6. Techniques of Demographic Analysis: K.B. Pathak, F. Ram, Himalaya Publishing Houses, Mumbai, 1992.

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	2	3	3	3	2
CO3	1	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	3	3	3	3	3	3
CO5	2	3	2	3	2	3	3	2	3	3

PAPER – V FIELD VISIT

	CONTENT	No. of Marks
Course Objective	<ul style="list-style-type: none"> ➤ To expose to the field realities in the rural areas through adoption of various extension methodologies ➤ To apply theoretical knowledge to analyse the real world problems and provide appropriate solutions ➤ To integrate the learning with field practice to reinforce the sustainable development concepts 	100
Places suggested to Visit	<ul style="list-style-type: none"> • Pollution Sites • Solid Waste treatment plant • Primary Health Centre • UBA Villages • Swachh Bharath Scheme implemented areas • Non Governmental Organizations, etc., 	
Evaluation	<ul style="list-style-type: none"> • The course evaluation is fully internal. It will comprise of PPT presentation after submission of the extension visit report followed by viva-voce examination. • The faculty in charge shall submit the marks to the Director after conducting the PPT presentation and viva voce. • The marks will be awarded based on the report, PPT presentation and viva-voce as detailed below. Report and PPT Presentation : 50 marks Viva-voce : 50 marks Total : 100 marks 	
Course Outcomes	<p>Students will be able to</p> <p>CO1 - Understand the realities of the rural settings</p> <p>CO2 - Analyse the status and functioning of government schemes</p> <p>CO3 - Apply suitable methods to attain sustainable development goals</p> <p>CO4 - Analyse the socio-economic problems and offer suitable solutions</p> <p>CO5 - Develop the concern for community and become a socially responsible citizen</p>	

PAPER VI: SOLID WASTE MANAGEMENT

UNIT	CONTENT	No. of Hours
	<p>Objectives</p> <ul style="list-style-type: none"> ➤ To provide an insight into the current scenario of solid waste generation and problem in its handling and management. ➤ To impart the knowledge the methods of collection and optimization of collection routing of municipal solid waste. ➤ To acquire the principles of treatment of municipal solid waste and the impact of solid waste on the health of the living beings ➤ To learn the criterion for selection of landfill and its design ➤ To plan the methods of processing such as composting the municipal organic waste. 	60
I	<p>Solid Waste : Definition - Sources and Types of Solid Waste - Generation of Solid Waste - Classification and Chemical Composition- Characterization of Municipal Solid Waste - Hazardous Waste and Biomedical Waste</p>	10
II	<p>Sources of Solid Waste: Municipal Solid Waste - Sources and Types of Municipal Solid Waste- Composition and its Determinants of Solid Waste - Factors influencing Generation-quantity assessment of Solid Wastes - Methods of Sampling and Characterization</p>	12
III	<p>Solid Waste Management: Collection of Solid Waste - Collection Services - Collection System - Factors affecting Collection - Transfer and Transport - Need for Transfer Operation - Transfer Stations - location of Transport Stations - Manpower Requirement - selection of Location - Types & Design requirements - Operation & Maintenance</p>	12
IV	<p>Waste - to- Energy (WTE): Sanitary landfill- Methods of Operation - advantages and disadvantages of Sanitary Land Fill - Processing Techniques and Recovery of Energy – Purpose of Mechanical Volume Reduction – Process of Chemical Volume Reduction - Incineration – Recovery System - Processing and Recovery Systems – Gas and Heat recovery</p>	14
V	<p>Policies for Solid Waste Management: Lifecycle Inventory of Solid Waste - LCA - Role - Advantage and Limitation - Municipal Solid Wastes Rules - Hazardous Wastes Management and Handling Rules - Biomedical Waste Rules – Need for eco-friendly or green products in reduction of Solid Waste</p>	12

Course Outcomes	Students will be able CO1 - To achieve an overview understanding of the main aspects of waste policy and systems CO2 - To familiarize with the characterization of different kinds of solid and hazardous wastes and their treatment CO3 - To Design the collection systems of solid waste of a town CO4 - To Design treatment of municipal solid waste and landfill CO5 - To know the criteria for selection of landfill and characterize the solid waste and design a composting facility
Reference	<ol style="list-style-type: none"> Asnani, P. U. 2006. Solid waste management. India Infrastructure Report 570. Bagchi, A. 2004. Design of Landfills and Integrated Solid Waste Management. John Wiley & Sons. Blackman, W.C. 2001. Basic Hazardous Waste Management. CRC Press. McDougall, F. R., White, P. R., Franke, M., & Hindle, P. 2008. Integrated Solid Waste Management: A Life Cycle Inventory. John Wiley & Sons. White, P.R., Franke, M. &Hindle P. 1995. Integrated Solid waste Management: A Lifecycle Inventory. Blackie Academic & Professionals. Zhu, D., Asnani, P.U., Zurbrugg, C., Anapolsky, S. & Mani, S. 2008. Improving Municipal Solid waste Management in India. The World Bank, Washington D.C. Chang, Ni-Bin Pires, (2015) Ana Sustainable Solid Waste Management: A Systems Engineering Approach, Wiley – Newyork Javed, Saira, and Faheem Malik (2022) "Urban Solid Waste Management." American Journal of Environment Studies 5, no. 2 Akhila, Ittiyil, Shabna Mol, and Geethu Vijayan (2019) "Solid waste management." <i>Scire Science Newsletter</i> 3, no. 1

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	3	3	2	3	3	3
CO2	1	2	3	3	3	3	3	3	2	3
CO3	2	3	3	2	3	2	3	3	3	3
CO4	3	2	3	3	3	3	3	3	2	3
CO5	3	2	3	2	3	3	3	3	3	2

PAPER VII: NATURAL RESOURCES AND ITS MANAGEMENT

UNIT	CONTENT	No. of Hours
	<p>Objectives</p> <ul style="list-style-type: none"> ➤ To provide a view of the nature of Earth's resources, their generation, extraction and impact of human activities on earth's environment ➤ To provide a better understanding on effective management strategies and give a critical insight of the major sustainability issues ➤ To make the understand of the basic concepts, compounds and reactions occurring in organic and biochemical systems, particularly as related to the environment, plants and food crops 	60
I	<p>Resource : Importance of Natural Resources - Overview of Natural Resources - Availability - Factors influencing and affecting its Availability - Resource Degradation - Conservation - Human Impact on Natural Resources</p>	10
II	<p>Natural Resource Classification : Based on Origin : Biotic and Abiotic – Based on Utility : Energy and Raw Material – Based on ownership : Individual, Community and National – Based on availability : Renewable and Non renewable – Based on Development : Potential, Developed, Stock and Reserves</p>	15
III	<p>Non-renewable Energy Resources : Oil - Natural gas - Coal - Environmental Impacts of Non Renewable Energy Consumption - Disparity in Energy Supply - Variation in Energy Consumption - Impact of Energy Consumption on Global Economy - Application of Green Technology - Future Energy Options and Challenges</p>	15
IV	<p>Renewable Energy Resources - Benefits - Energy Efficiency - Life Cycle Cost -Cogeneration - Solar Energy - Hydropower - Nuclear power - Tidal energy - Wave energy - Ocean Thermal Energy Conversion (OTEC)- Geothermal energy - Energy from Biomass; Bio-Diesel</p>	10
V	<p>Resource Management: Need – Importance - Approaches in resource management – Eight Principles of NRM – Types of Natural Resource Management : Forest – Water - Land – Minerals – Energy - Natural Resource Management and Challenges</p>	10

Course Outcomes	<p>Students will be able</p> <p>CO1 - To define the major formative processes behind natural resource issues</p> <p>CO2 - To discuss the integrated nature of human activities, environmental values, ecological processes and sustainable resource management</p> <p>CO3 - To critically evaluate current events and public information related to natural resources as being scientifically-based or opinion-based and contributes to the knowledge base of information.</p> <p>CO4 - To having a greater knowledge of how natural resources relate to the economy and environment, both currently and in the future</p> <p>CO5 - To understand the need for natural resources conservation</p>
Reference	<ol style="list-style-type: none"> 1. Craig, J.R., Vaughan. D.J. & Skinner. B.J. 1996. Resources of the Earth: Origin, Use, and Environmental Impacts (2nd edition). Prentice Hall, New Jersey. 2. Freeman, A.M. 2001. Measures of value and Resources: Resources for the Future. Washington DC. 3. Freeman, A.M. 2003. Millennium Ecosystem Assessment: Conceptual Framework. Island Press. 4. Ginley, D.S. & Cahen, D. 2011. Fundamentals of Materials for Energy and Environmental Sustainability. Cambridge University Press. 5. Klee, G.A. 1991. Conservation of Natural Resources. Prentice Hall Publication. 6. Owen, O.S, Chiras, D.D, & Reganold, J.P. 1998. Natural Resource Conservation – Management for Sustainable Future (7th edition). Prentice Hall

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	3	1	3
CO3	3	2	3	2	3	3	3	3	3	2
CO4	2	3	3	3	3	2	3	3	3	3
CO5	2	3	3	3	3	3	3	3	3	3

PAPER VIII: GENDER AND ENVIRONMENTAL MANAGEMENT

UNIT	CONTENT	No. of Hours
	<p>Objectives</p> <ul style="list-style-type: none"> ➤ To acquire knowledge of core concepts, theories, ideas and historical processes connecting and analyzing Gender and Environment. ➤ To draw on a variety of disciplines to understand and analyze the concepts of Gender and Environment. ➤ To identify the competence of gender, environment and activism among people with diverse backgrounds and disciplines 	60
I	<p>Introduction: Gender - Definition - Difference between Sex and Gender - Gender and society - Matriarchy and Patriarchy - Social Exclusion Gender Equity Issues in Rural and Urban Settings - Gender and Management of Natural Resources</p>	12
II	<p>Gender and the Environment: Gender and the Environment - Evolution of Gender Hierarchies in Historical and Contemporary Perspective - Gendered Division of Roles in Cultural - Social and Economic Perspective - Gender Inequalities - Types - Causes - Need for Gender Equity</p>	12
III	<p>Gender, Resources and Environment: Gender and Resources - Knowledge about the Environment among Men and Women - Differential Dependencies on Environmental Resources; Women and Rural Environment - Water Resources - Livestock Management - Gender and Agriculture - Food Security</p>	12
IV	<p>Gender and Environmental Management: Approaches in Resource Management: Integrated Resource Management Strategies - Women's Participation in Environmental Movements and Conservation - Awareness on Drainage and Sanitation - Urbanization - Role of Women in Waste Management - Environmental Education, Awareness and Sustainable Development</p>	12
V	<p>Strategies for Social Change - Instruments for change: Education - Media - Action Groups - Policy and Management – Role of Women in Agro Biodiversity - Role of Women in Seed Preservation and Conservation - Equity in Resource availability and Consumption for a Sustainable Future</p>	12

Course Outcomes	<p>Students will be able</p> <p>CO1 - To define and evaluate gender as a social construct</p> <p>CO2 - To identify the ways gender, power; privilege and oppression play out across a range of cultures and human experiences</p> <p>CO3 - To demonstrate an understanding of Gender as it intersects with race, ethnicity, religion, class and other critical variables.</p> <p>CO4 - To explore understanding of Gender and environment through Analytical lenses spanning multiple disciplines</p> <p>CO5 - To understand the important role played by women in environmental conservation</p>
Reference	<ol style="list-style-type: none"> 1. Agarwal, B. 1992. The Gender and Environment Debate: Lessons from India. Feminist Studies (Minnesota). 2. Agarwal, B. 1997. Gender, Environment and Poverty Interlinks: Regional Variations and Temporal Shifts in Rural India: 1971-1991. World Development 25: 1-42. 3. Agarwal, B. 2001. Participatory exclusions, community forestry, and gender: An analysis for South Asia and a conceptual framework. World Development 29: 1623-1648. 4. Jackson, C. 1993. Doing what comes naturally? Women and environment in development World Development 21: 1947-63. 5. Krishna, S. 2004. Livelihood and Gender. New Delhi, Sage. 6. Leach, M. 2007. Earth Mother myths and other eco-feminist fables: How a strategic notion rose and fell. Development and Change 38: 67-85.

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	3	3	3
CO3	3	2	3	3	2	3	2	3	3	3
CO4	2	3	3	3	3	3	3	2	2	3
CO5	2	3	3	3	3	3	3	3	2	3

PAPER IX: FUTURE OF GREEN TECHNOLOGIES

UNIT	CONTENT	No. of Hours
	<p>Objectives</p> <ul style="list-style-type: none"> ❖ To introduce the concept of green technology, its goals and advantages. ❖ To highlight a potential role of green technologies in realizing the goal of sustainable development. ❖ To focus on community participation to tap the economic benefits associated with switching to green technologies. ❖ To elaborate the major challenges and their resolution for implementation of green technologies 	60
I	<p>Green Technology : Definition and concepts – History and Evolution of Green Technology – Advantages and Disadvantages – Factors influencing Green Technologies -Sustainable Consumption of Resources - Individual and Community Level Participation</p>	10
II	<p>Green Technologies : Green Technologies in Historical and Contemporary Perspectives - Successful Green Technologies - Wind Turbines - Solar Panels - 5 R's of Green Technology - Paradigm shift from 'Cradle to Cradle' to 'Cradle to Grave'</p>	10
III	<p>Green Infrastructure : Planning and Economy - Green Buildings – History, Need and Relevance - construction - Associated Costs and Benefits - LEED Certified Building - Importance and Implementation - Concept of Green Cities - Waste Reduction and Recycling in Cities - Role of Informal Sector in Waste Management - Public Transportation for Sustainable Development – Green Belts</p>	13
IV	<p>Applications of Green Technologies : Increase in Energy Efficiency - Green House Gas (GHG) Emissions Reduction - Pollution Reduction and Removal (Flue Gas Desulfurization (FGD) Methods - Classification of FGD Techniques – Green Performance RATING</p>	12
V	<p>Green Future : Agenda of Green Development - Reduction of Ecological Footprint - Major Challenges and their Resolution for Implementation of Green Technologies - Green Practices to Conserve Natural Resources - Emphasis on Waste Reduction instead of Recycling - Role of Advancement in Science in Developing Environmental Friendly Technologies</p>	15

Course Outcomes	<p>Students will be able</p> <p>CO1 - To learn the basic principles and definitions of green technology</p> <p>CO2 - To understand the waste reduction methods in green technologies</p> <p>CO3 - To develop green infrastructure for sustainable life style</p> <p>CO4 - To know the available technologies for the reduction of pollution through green technology</p> <p>CO5 - To provide information about the methods of calculation, conservation of natural resources and advancement in green technology.</p>
Reference	<ol style="list-style-type: none"> 1. Anastas, P.T. & Warner, J.C. 1998. Green Chemistry: Theory & Practice. Oxford University Press. 2. Arceivala, S.L. 2014. Green Technologies: For a Better Future. Mc-Graw Hill Publications. 3. Baker, S. 2006. Sustainable Development. Routledge Press. 4. Hrubovcak, J., Vasavada, U. & Aldy, J. E. 1999. Green technologies for a more sustainable agriculture (No. 33721). United States Department of Agriculture, Economic Research Service. 5. Thangavel, P. & Sridevi, G. 2015. Environmental Sustainability: Role of Green Technologies. Springer publications. 6. Woolley, T. & Kimmins, S. 2002. Green Building Handbook (Volume 1 and 2). Spon Press. 7. Soli J. Arceivala, Green Technologies, McGraw Hill Education (India) Private Limited, 2017. 8. Shailendra Bhardwaj, FGD System : An Initiative towards Cleaner Environment, Notion Press, 2021.

Mapping of COs with POs and PSOs

CPO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	3	3	3	3	3	3
CO2	2	3	3	3	3	3	2	3	2	3
CO3	1	3	3	3	3	3	3	3	3	3
CO4	2	3	3	3	3	2	3	2	3	3
CO5	3	3	3	3	3	2	3	2	3	2

PAPER – X DISSERTATION

UNIT	CONTENT
Course Objectives	<ul style="list-style-type: none"> • To find out the different issues in a study area • To critically analyse the existing system and the causes for the issues • To select the specific issues through the review of relevant literature • To adopt appropriate research strategy and collect data from the source • To provide valuable suggestions from the study and draw a conclusion
Guidelines	<p>Nature of Project Work : The project work should focus on a research problem relevant to Sustainable Development</p> <p>Sources of Data : May be Primary or Secondary data</p> <p>Format : The Dissertation report must be Calico Bound Bindingboards</p>
Layout of the Report	<ol style="list-style-type: none"> 1. Introduction 2. Review of Literature 3. Methodology 4. Analysis 5. Conclusion and Suggestions <p>Bibliography Appendix</p>
Scheme of Examination	<p>Report</p> <p style="padding-left: 40px;">Internal Assessment - 75 Marks</p> <p style="padding-left: 40px;">External Evaluation - 75 Marks</p> <p style="text-align: center;">Total = 150</p> <p>Viva – Voce</p> <p style="text-align: center;">Total 50 Marks = 25 Marks each by Internal and External Examiners</p>
Course Outcomes	<p>At the end of the Submission, The Students</p> <p>CO1 - Able to assess the various issues in the society and Environment</p> <p>CO2 – Have Deep understanding of the subject</p> <p>CO3 - Gain knowledge in research methodology especially in Sample selection and Data collection methods</p> <p>CO4 - Understand the steps involved in report writing and make a conclusion from the study</p> <p>CO5 - Capable to do independent research in different fields</p>

