



**TUMKUR UNIVERSITY**

**REGULATIONS, COURSE STRUCTURE & SYLLABUS**

**POST GRADUATE DIPLOMA IN ENVIRONMENTAL SUSTAINABILITY AND  
GOVERNANCE (PGDESG)**

## 1.0 COURSE STRUCTURE

### SEMESTER I

Sl. No.	Paper	Title of the paper	Instructions Hrs. per week	No. of credits	Duration of the Examn.	Marks		
						Internal assessment	Semester end Examn.	Total marks
1	T 1.1	Goals and Challenges of Sustainable Development	4	4	3 Hrs.	20	80	100
2	T 1.2	Environmental Governance	4	4	3 Hrs.	20	80	100
3	PD - 1.3	Project Dissertation based On T 1.1/1.2	4	4	3 Hrs.	20	80	100
4	P-1.4	Practical's Based on T 1.1	4	2	3 Hrs.	10	40	50
5	P-1.5	Practical's Based On T 1.2	4	2	3 Hrs.	10	40	50
6	PP 1.6	Practical's Based on Project Dissertation PD 1.3	4	2	3 Hrs.	10	40	50

T: theory      P: practical      PD: Project Dissertation      PP: Project Practical's

## SEMESTER II

Sl. No.	Paper	Title of the paper	Instructions Hrs. per week	No. of credits	Duration of the Examn.	Marks		
						Internal assessment	Semester end Examn.	Total marks
1	T 2.1	Environmental management	4	4	3 Hrs.	20	80	100
2	T 2.2	Sustainable agriculture	4	4	3 Hrs.	20	80	100
3	PD - 2.3	Project Dissertation based On T 2.1/2.2	4	4	3 Hrs.	20	80	100
4	P-2.4	Practical's Based on T 2.1	4	2	3 Hrs.	10	40	50
5	P-2.5	Practical's Based On T 2.2	4	2	3 Hrs.	10	40	50
6	PP 2.6	Practical's Based on Project Dissertation PD 2.3	4	2	3 Hrs.	10	40	50

T: theory      P: practical      PD: Project Dissertation      PP: Project Practical's

## **2.0 SYLLABUS**

### **SEMESTER I**

#### **T-1.1 Paper 1: Goals and Challenges of Sustainable Development**

##### **Unit I: Goals of Sustainable Development**

Definition and Concept -History, Components of Sustainable development Environment Social Economic and Cultural, Importance of sustainability and its goals of sustainability Theories of Sustainability (Three Pillars of Sustainability) Systems and Ideal scientific model - Issues and Challenges relating to sustainability.. Stake holders of Sustainable development- People, Government, Investors, Industry, Judiciary and international organizations working for sustainable development. Approaches towards Sustainability - Community Capacity Building Approach, Industrial Sector Approach, Integrated Systems Approach, Human Development Approach, and Green Account Approach.

##### **Unit II: Challenges in Sustainable Development, Diversity and Social Exclusion:**

Sustainable development indices; Sustainable development Goal index, Measurement tools. Gross National Happiness (GNH) – Human Development Index (HDI) – Ecological Footprint (EF) – and the Happy Planet Index (HPI) and Indicators of Sustainable Development - Indicators for Education – Indicators for Health – Indicators for Economy – Indicators for Gender Equality – Indicators for Zero Hunger. Contemporary Issues of Development – Bottom of the pyramid approach; Understanding the importance of social capital, social mobilization, social security, and population stabilization.

##### **Unit III: Designs and development of Sustainability**

Designing of Sustainable development and its principles, Physical, mental, spiritual, cultural social, ethical and economic issues in designing. Eco-friendly design, sustainable materials (bamboo, cork, jute; etc) unexplored alternate materials for furniture's fabrics surface finishes and accessories. Reuse, recycling of waste and benign emissions, green design. Effects of construction materials and methods, building services and related key environmental issues. Choices in sustainable design- energy and water systems, products and assemblies for interior projects through renewable energy systems, definition Scope and goals of Life cycle assessment.

##### **Unit IV: Interventions for Sustainable Development:**

Social and Economic Interventions for Sustainable Development, Sustainable Cities and its planning. Employment opportunities, industrialization, urbanization, modern farming and storing facilities for raw agriculture products, Self-help groups, entrepreneurship, people friendly banking and start up support. Demand and supply management. Environment Protection measures, Environment protection policies. Waste management, Pollution control, reduce the use, reuse and recycle, sustainable energy, preservation of resources - forest and water. Sustainable buildings and Communities, Indian Green Building Council (IGBC), GRIHA, EDGE, principles of sustainable lifestyle.

## **T- 1.2 Paper 2: Environmental Governance**

### **UNIT I: Environmental governance in India;**

Evolution of environmental governance in India, Constitutional Amendments, Environmental Governance: Institutions, Processes, Factors responsible for good governance, Accountability and Transparency, Participation and Consensus, Environmental Governance ;Problems and Prospects, Challenges on Environmental Governance

### **UNIT II: Environmental Policy and Law**

Environmental Protection Act, The Ministry of Environment, Forest and Climate Change (MoEFCC), Introduction, Objectives of MoEFCC, CPCB: Central Pollution Control Board, Introduction and objectives, Powers, Functions and activities of CPCB, Organizational Structure of CPCB, State Pollution Control Boards (SPCB), Introduction and objectives. Environmental Policy and Law: Pre & Post Independence Period ; Constitutional provisions on Environment and its Protection: Right to Environment – Duty to protect environment Public interest litigation and environment -Role of Judiciary on Environmental issues Doctrines of Environmental Pollution: Evolving new Principles – Absolute Liability -Polluter pays principle - Precautionary principle

### **UNIT III: Environmental Legislations and Policies**

Brief overview of Environmental Laws in India: Constitutional provisions in India (Article 48A and 51A); Wildlife Protection Act, 1972 amendments 1991, Forest Conservation Act, 1980, Indian Forest Act, Revised 1982, Biological Diversity Act, 2002; Water (Prevention and Control of Pollution) Act, 1974 amended 1988 and Rules 1975; Air (Prevention and Control of Pollution) Act, Environmental (Protection) Act, 1986 and Rules 1986; Motor Vehicle Act, 1988; The Hazardous and Other Waste (Management and Trans boundary Movement) Rules, 2016; The Plastic Waste Management Rules, 2016; The Bio- Medical Waste Management Rules, 2016; The Solid Waste Management Rules, 2016; The e-waste (Management) Rules 2016; The Construction and Demolition Waste Management Rules, 2016; The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000; The Batteries (Management and Handling) Rules, 2010 with Amendments; The Public Liability Insurance Act, 1991 and Rules 1991; Noise Pollution (Regulation and Control) Rules, 2000; Coastal Regulation Zones (CRZ) 1991; National Forest Policy, 1988; National Water Policy, 2002; National Environmental Policy, 2006; Environmental Conventions and Agreements. Biodiversity act 2002.

### **UNIT IV: Environmental Economics, Auditing and Design**

Introduction to environmental audit, objectives, Types of environmental audits:, Benefits of environmental auditing; General audit methodology and audit process: Pre-audit procedure, on-site audit procedure and post audit procedure: Initial meeting, communication during the audit, the role and responsibilities of guides and observers, collect and verify information, a summary of findings from the audit, preparation of audit findings, the final meeting. Tariffs and subsidies; Energy utility interface; National Energy Plan, Energy Investment Planning & Energy pricing, Concept of Energy & Environment Management System (EEMS), Role of modelling in energy policy analysis, Role of BEE (Bureau of Energy Efficiency) in energy conservation.

#### **P-1.4 Goals and Challenges of Sustainable Development**

- i. Water Conservation and Quality Testing
- ii. Renewable Energy Mini-Grid
- iii. Urban Gardening and Food Production
- iv. Plastic Waste Reduction and Recycling
- v. Measuring Air Quality in Different Environments
- vi. Diversity and Ecosystem Health Assessment
- vii. Climate Change Data Collection and Analysis
- viii. Assessing Gender Equality in Local Communities
- ix. Sustainable Urban Planning Simulation
- x. Energy Efficiency in Household Appliances

#### **P-1.5 Environmental Governance**

- i. Policy Analysis of Carbon Offset Programs
- ii. Cost-Benefit Analysis of Renewable Energy Incentives
- iii. Impact Assessment of Environmental Education Programs
- iv. Comparative Study of Water Quality Standards and Compliance
- v. Analysis of Corporate Environmental Reporting Practices
- vi. Participatory Research in Community Waste Management
- vii. Economic Valuation of Ecosystem Services in Urban Green Spaces
- viii. Comparative Analysis of Climate Adaptation Policies
- ix. Carbon Footprint and Lifecycle Analysis of Local Products
- x. Ecosystem Governance through Traditional Knowledge Integration

## **SEMESTER II**

### **T 2.1: Environmental Management**

#### **Unit I: History of Environment Management (EM) and Environmental Sociology**

Environment Management in India, R & D in India for Environmental Science and Technology, Environmental Training- Propositions, Practice and Problems, Environmental Quality Management, A New Concept; Its Application and Success, Preparation of Environment Management Plan, Concept of Integrated Resource Management. Environmental sociology; Interrelationship among Ecology, Environment and Society. Role of population growth, technology and urbanization on society. Environmental Movements in India with special reference to Chipko and Appiko movement. Human Rights in relation to environment. Role of NGOs in Environmental Protection

#### **Unit II: Concepts of Industrial Ecology & Corporate Environment Management**

Nature of Industrial Ecology; issues and challenges, Guidelines for Siting of Industries, Industrial Safety and Management techniques: Industrial Safety standards. Concept of Green Development, Eco-labelling and Cleaner Technology in Four Target Industries: Chemical, Pulp and Paper, Textile and Electroplating industries, Green Belt Technology: Development and Design. Evolution of Environmental Stewardship Environmental Management Principles - National policies on environment, abatement of pollution

#### **Unit III: Urban and Rural Planning**

Concept of human settlement – Rural and Urban settlement, Evolution and planning in Urban and Rural settlement, Environment Management in Human Settlement; Management Response for Metropolis, Small Cities, Slums and Rural Sectors. Differentiation between rural and urban settlement, concept of town, Evolved and Created Town Characteristics, Urban planning process, Role of urban planner, Disaster Management: Manmade & Natural. Problems and Challenges, Indoor Air Pollution: Growing Crisis, Health Effects and Its Management Prospects.

#### **UNIT IV: Resource Management and Environmental Risks**

The concept of Resource, types and Status, Integrated Resource Management, Forest as a natural resource- Afforestation, Reforestation and Regeneration, Forest Cover in India; Natural Forest Management vs. Joint Forest Management, Wildlife as a resource, Wildlife Protection and acts, Wildlife corridors in India, Factors affecting natural resources and threats - Mining, Problems and Issues, Mineral Resources of India Land & Soil Management Practices, Risks Associated with- Population Explosion (Encroachment, new settlement, rehabilitation) Highways (State and National Highways) Problems and issues.

## **T 2.2: Sustainable Agriculture**

### **Unit I: Introduction to Agronomy**

Agronomy and its scope. Classification of Crops on different basis. Agronomic classification of crops. Importance of Indian Agriculture. Commercial agriculture, sustainable agriculture seasons in India. Soils & Tillage Soils and tillage - sustainable crop production. Principle of agronomy - Physical Properties of Soil, Chemical Properties of Soil, Biological Properties of Soil, Soil Organic Matter, Salt Affected Soils, and Tillage. Soil Erosion, Water Erosion, Wind Erosion. Irrigation and Water Management Importance of water in crop production. Soil Moisture constants. Estimation of potential evapo-transpiration and consumptive use. Approaches of irrigation scheduling. Systems and methods of irrigation – drip, sprinkler and mist Irrigation. Quantity and quality of irrigation. Measurement of irrigation water. Elementary idea of drainage on farms.

### **Unit II: Farming System, Precision Farming and Sustainable Agriculture**

Farming System-scope, importance, and concept, Types and systems of farming system and factors affecting types of farming, Farming system components and their maintenance, Cropping system and pattern, multiple cropping system, Efficient cropping system and their evaluation, Sustainable agriculture-problems and its impact on agriculture, conservation agriculture strategies, HEIA, LELA and LEISA and its techniques for sustainability, Integrated farming system components of IFS and its advantages, farming system and environment.

### **Unit III: Empowerment of the Company Secretary Profession**

Company Secretary (CS) professionals are recognized as Key Managerial Personnel (KMP) under the Companies Act, 2013, wherein they are entrusted with a senior-level position in the management and are an intrinsic part of the Board of corporate entity. Since past five decades, Professionals have witnessed a substantial and spectacular growth and development made by Institute of Company Secretaries of India (ICSI) especially in the areas of recognitions obtained from various Agencies/ Government for the benefit of its members. The ICSI provides top-quality education to the students of Company Secretaryship (CS) Course and has set best quality standards at each level. CS as hardcore professionals have developed core competence in compliances and corporate governance. They are specialized professionals in the matter of compliance enjoined under various statutes and rules, regulations, bye-laws, guidelines made there under. With the passage of time and especially after the enactment of Companies Act, 2013 the role of Company Secretaries have grown manifold. In view of this, the lesson has focused on the past, current and evolving role of Company Secretaries, role of Company Secretaries in employment and practice, their role in board governance.

### **Unit IV: Sustainability Audit and ESG Rating**

Sustainable development is a relatively new concept and gained momentum in the late 1980s. The UN's Brundtland report. ESG (environmental, social, and corporate governance) values of organizational stakeholders (such as employees, customers and suppliers and financiers). Evolution of sustainability audit, framework of sustainability audit, process of conducting sustainability audit, ESG Reporting in India, ESG Regulations around the world etc. Materiality Assessment, Impact of Climate Change, Energy Management Strategies, Resource Management Strategies, Compliance with Environmental Regulations, Impacts of Environment Sustainability. ESG Reporting & Communication, Global Reporting Initiative (GRI) 1: Foundation, Global Reporting Initiative



(GRI) 2: General Disclosure, Global Reporting Initiative (GRI) 3: Material Topic: TCFD: Governance Disclosure, TCFD: Strategy Disclosure, TCFD: Risk Management Disclosure, TCFD: Metrics and Target Disclosure.

#### **P- 2.4: Environmental Management**

- i. Heavy Metal Analysis in Water Samples
- ii. Analysis of Particulate Matter (PM) in Air Samples
- iii. Composting and Organic Waste Degradation
- iv. Soil Nutrient and Fertility Analysis
- v. Microbial Water Quality Testing
- vi. Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) Testing
- vii. Efficiency Testing of Wastewater Treatment Techniques
- viii. Carbon Sequestration Potential of Different Plant Species
- ix. Testing Efficacy of Natural Coagulants in Water Treatment
- x. Testing Alternative Materials for Biodegradable Plastics

#### **P- 2.5: Sustainable Agriculture**

- i. Soil Health Assessment and Microbial Activity
- ii. Composting and Organic Matter Decomposition
- iii. Nitrogen Fixation by Leguminous Plants
- iv. Water Retention Capacity of Different Soil
- v. Bio fertilizer Production and Effectiveness on Crop Growth
- vi. Soil pH and Its Effect on Nutrient Availability
- vii. Green Manure and Soil Fertility Enhancement
- viii. Vermicomposting for Organic Waste Recycling
- ix. Assessing Organic vs. Conventional Fertilizers on Plant Yield
- x. Evaluating the Impact of Cover Crops on Soil Erosion and Health

**PD 1.3/2.3 Students should give a detailed report on the project undertaken and give a presentation to the viva-voce committee**

### 3.0 QUESTION PAPER PATTERN

**Max. Marks = 80**

**NOTE: Question No. 1 is compulsory. Answer any four questions from 2 to 6.**

- |  |                   |
|--|-------------------|
| <b>1. Answer In Brief (Answer any eight)</b>             | <b>8 x 2 = 16</b> |
| a.   |                   |
| b.   |                   |
| c.   |                   |
| d.   |                   |
| e.   |                   |
| f.   |                   |
| g.   |                   |
| h.   |                   |
| i.   |                   |
| j.   |                   |
| <b>2. Essay type question</b>                            | <b>16</b>         |
| <b>3. Essay type question</b>                            | <b>16</b>         |
| <b>4. Essay type question</b>                            | <b>16</b>         |
| <b>5. Essay type question</b>                            | <b>16</b>         |
| <b>6. Write short notes on any four of the following</b> | <b>4 x 4 = 16</b> |
| a.   |                   |
| b.   |                   |
| c.   |                   |
| d.   |                   |
| e.   |                   |

### PRACTICAL/ DISSERTATION PATTERN

**Max. Marks = 40**

- |   |          |
|---|----------|
| 1. Project Dissertation/ internship report/ Experiments | 30 marks |
| 2. Records and Submission                               | 05 marks |
| 3. Viva – voce  | 05 marks |

**Note: Equal weightage should be given to all the units while setting the question paper**

### 4.0 INTERNAL ASSESSMENT MARKS ALLOTMENT BASIS

- |                                      |            |
|--------------------------------------|------------|
| Class test                           | : 05 marks |
| Classroom participation              | : 05 marks |
| Assignments/ seminars/ group debates | : 10 marks |

**Total: 20 marks**