

<b>PIPM 8008</b>	<b>SUSTAINABILITY AND CLIMATE CHANGE</b>	L	T	P	C
<b>Version 1.0</b>		3	0	0	3
<b>Pre-requisites/Exposure</b>	Graduate				
<b>Co-requisites</b>	Good Command in MS Word and MS Powerpoint				

### Course Objectives

- a) To be suitable to become as good entrepreneurial personal
- b) To understand regulatory framework in infrastructure in undertaking projects

### Course Outcomes

On completion of this course, the students will be able to

CO1: To understand autonomous use of their knowledge

CO2: To develop the students' ability to deal with complex phenomena, issues and situations

CO3: To analyse potential for professional activities that demand considerable autonomy, or for research and development work.

### Catalog Description

The subject is based on an interdisciplinary, holistic view of the economic, social and environmental dimensions. Knowledge of basic biological and environmental conditions and how these can limit and render economic and social development, together with knowledge and deeper understanding of the social and economic systems impact on our ability to use natural resources are central. The course therefore incorporates several scientific disciplines.

### Course Content

---

#### **Unit I: 6 lecture hours**

Introduction to Sustainable Development, What is Sustainable Development, Developmental Issues, Natural Resource Exploitation, Patterns of Industrialisation, Inequitable Growth, Global and Regional Dimensions, Initiatives towards Sustainable Development, Strategy for Sustainable Development, Community Knowledge, Harness Technology, Innovative Practices, Cooperation and Partnership

#### **Unit II: 6 lecture hours**

Energy and Environment: Current Concerns, Energy and Development, Energy Consumption, Energy Production Technologies, Environmental Impact of Energy Production and Use, The North-South Debate Energy Policy and Planning, Energy Policy, Energy Planning, Energy: The Indian Scenario, Economics of Energy and Environment, Economic Approaches to the Energy Problem, Energy Infrastructure, Services and Efficiency Improvement, Social Control of Energy Energy, Sustainability and Environment, Solar Energy Technologies, Biomass Resources and Technologies Hydropower and Wind Energy Sustainable Energy for Clean Environment

#### **Unit III: 7.5 lecture hours**

Evolving concepts and Principles, Integrated Environmental Management, Integrating Environment into Rural Development, Managing the Urban Environment, Environmental Management System Sectoral Approaches, Water Resource Management Unit 8 Industrial Waste Management, Dimensional Approaches, Economic Dimensions, Technological

Dimensions, Socio-Cultural Dimensions , Ethical and Moral Dimensions **Unit IV:**

**7.5 lecture hours**

Natural Resources: Physical, Introduction to Natural Resources, Land, Soil and Water, Energy and Mineral Resources, Natural Resource Conservation, Natural Resources: Biotic, Introduction to Biodiversity, Global Distribution of Biodiversity, The Value of Biodiversity, Resource Use of Biodiversity Loss of Global Biodiversity

**Unit V: 12 lecture hours**

Environment-Agriculture Relationship, The Evolution of Agriculture, Agro-Ecosystems, Impact of Agriculture on Environment, Impact of Environment on Agriculture, Sustainability: The New Paradigm Agro-Environmental Resources: Issues and Challenges, Land ; Water, Biodiversity, Energy , Off-farm Inputs

**Text Books and Journals**

- a) V.G.Ramachandran’s Law of Land Acquisition and Compensation
- b) The Price of Land Acquisition Conflict Consequence
- c) Land Acquisition, Displacement and Resettlement in Gujarat 1947-2004
- d) Law of Acquisition of Land in Indi
- e) Commentary on the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013
- f) Guide to New Land Acquisition Law (As amended by 2014 ordinance)

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination Examination Scheme:**

Components	Presentation/Assignment/Projects etc	ESE
Weightage (%)	50	50

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Programme Outcomes
<b>CO1</b>	To understand autonomous use of their knowledge	PO 1,2, ,4,7,8,9,10, 11,12,13, 14
<b>CO2</b>	To develop the students' ability to deal with complex phenomena, issues and situations	PO 1,2, 3, 7,8,9,10, 11,14
<b>CO3</b>	To analyse potential for professional activities that demand considerable autonomy, or for research and development work.	PO 1,2, 3, 8,9,10, 11, 12,13,14

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
PIPM 8008	SUSTAINABILITY AND CLIMATE CHANGE	2	3	3	2	3	2	1	1	2	3	3	3	3	3
		Students will demonstrate strong conceptual knowledge and execution in soft and hard infrastructure planning, development, management, financing, regulation and governance.	Students will demonstrate effective understanding of infrastructure planning and development, utility & energy management, urban transportation including metro rail, e-vehicle with charging and other modes of urban surface transportation, water supply and sewerage, smart city planning and effective financing urban infrastructure.	Students will demonstrate analytical skills to understand issues with remedial solutions relating to urban infrastructure. of soft and hard infrastructure	Students will exhibit the ability to integrate planning, construction & development, operation & management, financing, regulation and governance of urban infrastructure projects and facilities.	Students will exhibit the ability to integrate technical, economic, social and regulatory frameworks for urban infrastructure sector planning and resource management.	Students will exhibit deployable skills pertinent to urban hard and soft infrastructure sector and smart city development and management.	Students will be able to develop and evaluate alternate managerial choices and identify optimal solutions.	Students will demonstrate effective application capabilities of their conceptual understanding to infrastructure planning, development and management.	Students will be able to exhibit effective decision-making skills, employing analytical and critical thinking ability for planning, development and management of soft and hard infrastructure.	Students will demonstrate effective oral and written communication skills in the professional context.	Students will be able to work effectively in teams and demonstrate team-working capabilities.	Students will exhibit leadership and networking skills.	Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the context of urban planning, development and management including cost effective financing and good governance.	Students will demonstrate employability traits in line with the needs of changing hard and soft urban infrastructure sector.

1=weakly mapped  
2= moderately mapped  
3=strongly mapped

CourseOutcomes	CO 1	CO 2	CO 3
PO 1	3	3	3
PO 2	3	3	3
PO 3	2	3	3
PO 4	3	2	2
PO 5	2	2	2
PO 6	2	2	2

<b>PO 7</b>	3	3	2
<b>PO 8</b>	3	3	3
<b>PSO 9</b>	3	3	3
<b>PSO 10</b>	3	3	3
<b>PSO 11</b>	3	3	3
<b>PSO 12</b>	3	2	3
<b>PSO 13</b>	3	2	3
<b>PSO 14</b>	2	3	3

### **Model Question Paper**

<b>Name:</b>			
<b>Enrolment No:</b>			
<b>Course: SUSTAINABILITY AND CLIMATE CHANGE</b>			
<b>Programme: MBA UISC</b>	<b>Semester: Odd</b>		
<b>Time: 03 hrs.</b>	<b>Max. Marks:100</b>		
<b>Instructions:</b>			
<b>Section A</b> (each carrying 2 marks); Attempt all questions from <b>Section B</b> (each carrying 5 marks). Any <b>Two Questions</b> from <b>Section C</b> (carrying 15 marks). Case Study <b>Section D</b> ( 30 Marks)			
<b>Section A ( 10X2=20)</b>			
<b>Define the following</b>			
1	Illustrate the three pillar model of sustainability.	[2]	<b>CO1</b>
2	Comment on the challenges for sustainable development in our country and suggest a way to overcome the same.	[2]	<b>CO1</b>
3	Enumerate the major indentations of the Pollution Act.	[2]	<b>CO2</b>
4	What is the main motto of the Clean Development Mechanism (CDM)? Relate the same to the suggestions of Kyoto protocol.	[2]	<b>CO2</b>
5	Suggest any three sustainable methods each for the solid waste and waste water management system.	[2]	<b>CO3</b>
6	Explain the significance of carbon footprint. Suggest some methods for reducing the carbon footprint of your house.	[2]	<b>CO1</b>
7	Short Note on Life cycle assessment	[2]	<b>CO2</b>
8	Suggest some methods to the builder for getting a four star GRIHA rated building.	[2]	<b>CO2</b>

9	Differentiate between conventional and non conventional energy sources.	[2]	CO3
10	In future, the sources of fossil fuels become rare and extinct. Suggest some methods to overcome this crisis.	[2]	CO2
<b>SECTION B (Attempt all Questions)</b>			
11	“We can create a more Sustainable, cleaner and safer world by making wiser energy choices.” Evaluate the importance of the quote and discuss on the various Non-Conventional Energy Sources.	[5]	CO3
12	Transportation sector is the major source of pollution in the cities. What are the factors pointing to this statement? Suggest some methods to deal with traffic issues in urban areas.	[5]	CO1
13.	Slum formation is the major threat for urbanization. Discuss the reasons behind slum formation and the issues caused by slum in urban areas.	[5]	CO3
	With the help of a sketch, explain the working of a solar photovoltaic system.	[5]	CO1
<b>SECTION C (Attempt any Two Questions)</b>			
14.	“We can create a more Sustainable, cleaner and safer world by making wiser energy choices.” Evaluate the importance of the quote and discuss on the various Non-Conventional Energy Sources.	[15]	CO2
15.	Industrialization was the major turning point in the history. How did industrialization change the way of human life?	[15]	CO3
16	Engineering practices and technology can help to move the product, processes and systems developed by society towards sustainability. Substantiate this statement.	[15]	CO3
<b>SECTION D ( Case Study)</b>			
	<b>Case Study</b>	[30]	CO2
	<p>Air pollution in Asia has worsened since 2000 and is responsible for deaths of thousands of people in Beijing, Jakarta, Seoul and Manila. The pollution is a result of the use of fossil fuels by the industry and transport sectors. The problem got aggravated in Asia due to the use of poor quality fuel, inefficient method of energy production, use of vehicles in poor condition and traffic congestion. This was revealed during a research conducted by World Bank and Stockholm Development Institute. The research states that air pollution in the continent has surpassed the combined emissions in Europe and North America. The deaths caused by fine particulate matter far exceed those caused by sulphur dioxide, nitrogen oxide, ozone and lead. The health cost in major Asian cities now exceed for 15-18 percent of urban income expenditure, claims World Bank officials.</p> <p>Module 1</p> <p>QB1. (a). Identify any one component that need to be addressed towards attaining social, economic and environmental sustainability in the case illustrated. (1+1+1)</p>		

(b). Compare the given situation in the cities stated in the text with any major Indian city. Do you see any such catastrophe to happen/is happening here? Why?  
(1+2)

(c). Which multilateral environmental agreement(s) in the past think was proposed to curb the growing impact of pollution on humanity specific to the nations discussed here? Also highlight the instrument of action that is applicable in this context.  
(1+1)

(d). A project under Clean Development Mechanism is to be proposed to contain the growing air pollution in the countries discussed, at the same time tackling a development initiative. Could you propose a CDM initiative that might be used in all the regions discussed here? Focus your answer showing the impact on the populace and the activity.  
(2)

## Module 2

Q. B2 (a). A comprehensive campaign to address air pollution need to be launched through school children, what programme would you envisage for this. What is outcome anticipated?  
(3)

(b). There is a sudden decision to remove all vehicles from the road that fails to meet specified norms of emission level within a specified time period. As part of citizen forum you are requested to give views on the enforced regulation. State your views on this.  
(3)

(c) A massive campaign on environmental degradation is to be initiated. Bring out a slogan and the key message that need to be addressed.  
(2)

(d). Suppose you are a Carbon Credit Auditor appointed to assess the greenhouse gas emission reduction strategies. Identify a component of assessment and brief the methodology that could be adopted in connection with this.  
(2)

## Sample Case 2

### Case on Ecological Habitat Development

The project on ecological housing in Setagaya-Ku Fukasawa Tokyo, Japan provided environmentally sustainable housing in one of the most densest cities of the world with the normal public housing cost financed totally from public funds. Five apartment buildings were constructed with 70 dwellings, 43 of which were for low income residents. High levels of thermal insulation and technologies saving energy such as solar collector for heating and hot water, solar cells and wind turbines were attached and water saving techniques such as permeable pavement and rainwater collection were installed. Various passive lighting, heating and cooling methods were applied and the design was made according to local wind patterns to enable natural ventilation during hot and humid summers. The building materials were selected to have minimal impacts on the environment and health of residents. Many trees were preserved and moved to the site, a garden established, a green rooftops installed, which is important in the context of low urban greenery and a major heat island effect. Thirty percent saving of average household energy bills were achieved.

Shared community facilities were constructed. The project had a social dimension resulting in a social mix that is very rare in Tokyo.

### Module III

Q. B3. (a). Highlight the significance of life cycle cost evaluation when applied to such projects to establish the advantage of environmentally sustainable housing projects. (3)

(b). If you are asked to evaluate the environmental impact of the above project, state any two factors that can be identified as the key impacts on the environment. Also specify the necessary information required for the assessment of impact due to these factors. (4)

(c). If standardisation of these practices need to be attained how can ISO 14000 help the organisations to ensure quality of practice in environmentally sustainable housing projects? (3)

### Module IV

Q. B4. (a). Identify any three interventions made in the given project (case 2) to ensure energy efficient construction practice. (3)

(b). The project had also initiated large number of green buildings practices. Mention any two cases followed to make the practice green and also justify your claim appropriately (2+2)

(c). The project have tried to address social, environmental and economical dimension of habitat development. Identify any one step taken by the implementing agency to address each of the three parameters and also state how you would see these steps from Kerala perspective. (3)

### Sample Case/Data 3

### Module V

Q. B5. (a). The energy use policies have had serious impact on sustainability. Justify the statement based on the energy use pattern across the century (1900 to 2000) (3) (b). If the trend shown in this is expected to continue sketch a simple graph to estimate the energy use by the year 2050. (3)

(c). Among the different energy sources shown in the figure which one was the most recent to supply to energy needed for development? How do you see the potential of this energy source for future? Provide appropriate justification for your answer. (4)

(Another typical evaluation-level question that may be asked based on the given case, in Module V is as follows:

The biomass energy supply doesn't show a significant change in consumptive rate. What according to you could be a reason for this situation? )

### Module VI

	<p>Q. B6. (a). If industrial energy use is the dominant consumer of energy. Give any three suggestions for reducing the energy consumption in industries. (3)</p> <p>(b). Give a short account of pollution faced due to the prevailing practice of growth represented in the figure. (3)</p> <p>(c). If the given graph represent the blueprint of prevailing energy use, What suggestions would you propose to reduce the conventional energy use by 25 %. State any two steps initiated and how they are used to attain the anticipated reduction levels. (4)</p>		
--	--	--	--