B.S. Abdur Rahman Crescent Institute of Science & Technology
Deemed to be University u/s 3 of the UGC Act, 1956

17.3.17 c – Progress against SDG17-

Courses on Sustainability

Humanities Elective II

(To be offered in IV Semester)

		L	T	P	C
SSCXO4	**ECONOMICS OF SUSTAINABLE DEVELOPMENT**	**2**	**0**	**0**	**2**

OBJECTIVES:

- To have an increased awareness on the concept and components of sustainable development.
- To develop the ability to demonstrate the need of sustainable development and international responses to environmental challenges.
- To have an insight into global environmental issues and sustainable globalization.
- To establish a clear understanding of the policy instruments of sustainable development.

MODULE I CONCEPT OF SUSTAINABLE DEVELOPMENT 7

Evolution of the Concept – Rio Summit and sustainable development - various definitions of sustainable development - Components of sustainable development: Social, environmental and economic components.

MODULE II NEED FOR SUSTAINABLE DEVELOPMENT 8

Need for sustainability – Global environmental challenges: population growth, resource depletion, pollution, energy use, climate change, pollution, growing water scarcity, other urban problems, loss of biodiversity, hazardous wastes disposal.International responses to environmental challenges - Global policy such as Kyoto Protocol, Montreal Protocol, Basel Convention.

MODULE III GLOBALIZATION AND ENVIRONMENT SUSTAINABILITY 8

Impact of Globalization on sustainable development, Co - existence of globalization and Environment sustainability, Globalization and Global Governance.Green economy - Renewable energy, sustainable transport, sustainable construction, land and water management, waste management.

MODULE IV POLICIES FOR ACHIEVING SUSTAINABLE DEVELOPMENT 7

Principles of environmental policy for achieving sustainable development: precautionary principle and polluter pays principle – Business Charter for Sustainable Development.Policy instruments for sustainable development: direct regulation – market based pollution control instruments such as pollution tax, subsidy, pollution permits.

L – 30; T – 0; Total Hours –30

TEXT BOOKS:

1. Anderson, David A (2010), "*Environmental Economics and Natural Resource Management*", Routledge, 3rd edition.
2. Karpagam M (1999), "*Environmental Economics: A Textbook*", Sterling Publishers Pvt. Ltd, New Delhi.

REFERENCES:

1. Karpagam M and Jaikumar Geetha (2010), "*Green Management Theory and Applications*", Ane Books Pvt. Ltd, New Delhi.
2. Sengupta Ramprasad (2004), "*Ecology and Economics: An Approach to Sustainable Development*", Oxford University Press, New Delhi.

OUTCOMES:

On successful completion of this course,

- The students will have understood the concepts and components of sustainable development.
- The students will have a holistic overview on the challenges of sustainable development and International responses to environmental challenges.
- The students will have gained knowledge on the global environment issues and demonstrate responsible globalization through global governance.
- The students will have developed awareness of the ethical, economic, social and political dimensions that influence sustainable development.

Group II courses

(To be offered in VII Semester)

		L	T	P	C
GECX201	**GREEN DESIGN AND SUSTAINABILITY**	**3**	**0**	**0**	**3**

OBJECTIVES:

- To impart knowledge on the concepts of sustainable development and fundamentals of socio economic systems.
- To understand the basics of green building and frame work for the attainment of sustainability.
- To enhance the student's interest in the design of green building and energy efficient measures in a buildings.

MODULE I CONCEPTS OF SUSTAINABLE DEVELOPMENT 7

Objectives of Sustainable Development - Need for sustainable development-Environment and development linkages - Globalisation and environment-Population, poverty and pollution- global, regional and local environment issues-Green house gases and climate change.

MODULE II SUSTAINABLE DEVELOPMENT OF SOCIO ECONOMIC SYSTEMS 8

Demographic dynamics of sustainability- Policies for socio economic development- Sustainable Development through trade- Economic growth- Action Plan for implementing sustainable development- Sustainable Energy and Agriculture.

MODULE III FRAME WORK FOR ACHIEVING SUSTAINBAILITY 7

Sustainability indicators- Hurdles to sustainability- Business and Industry – Science and Technology for Sustainable Development- Performance indicators of sustainability and assessment mechanism- Constraints and barriers of Sustainable Development.

MODULE IV GREEN BUILDINGS 8

Introduction to Green Building- Energy- Water- Materials and Resources - Sustainable Sites and Land Use - Indoor Environmental Quality- Life Cycle Assessment- Energy, water and materials efficiency.

MODULE V ENERGY CONSERVATION AND EFFICIENCY 7

Energy savings- Energy Audit- Requirements- Benefits of Energy conservation-Energy conservation measures for buildings- Energy wastage- impact to the environment.

MODULE VI GREEN BUILDINGS DESIGN 8

Elements of Green Buildings Design- Foundation, Electrical, Plumbing, flooring, Decking, roofing, insulation, wall coverings, windows, siding, doors and finishing, LEED certification for Green Buildings, Green Buildings for sustainability.

Total Hours –45

TEXT BOOKS:

1. Kirby, J., Okeefe, P., and Timber lake, “Sustainable Development”, Earthscan Publication, London, 1995.

REFERENCES:

1. Charles Kibert, J., “Sustainable Construction: Green Building Design and Delivery”, 2nd Edition, John Wiley and sons, 2007.

OUTCOMES:

At the end of the course, the students will be able to

- explain the objective, need for the sustainability and also the link between the globalization and environment.
- Address the economic, environmental, and social concerns in the sustainable development.
- Acquire knowledge on the performance indicators, constraints and barrier for sustainability.
- Explain the relationship between sustainability and emergence of green building practices.
- Recommend relevant energy conservation measures in a building
- describe the elements in green building design and suggest ideas for attainting sustainability in building.

AR C 4803 GREEN AND SUSTAINABLE DESIGN **3 0 3**

AIM:

The course focuses on developing an understanding regarding environmental sustainability and environmentally responsible green buildings. It addresses the design concerns in architecture to develop resource-efficient buildings that have minimum adverse impact on the natural environment

OBJECTIVES:

- To understand the importance of environmentally and ecologically sensitive architecture
- To integrate sustainable planning and building principles in architectural design.
- To get introduced to agencies that work for green and sustainable architectural developments.

UNIT I INTRODUTION **9**

Concepts of sustainability, Sustainable Development, Green field development: Brown field development, Principles of conservation - synergy with nature, Sustainable planning & Design, Sustainable approach to site planning and design - site inventories- relationships between site factors - development impacts from one area of the site on the other areas, Intro to Environmental Design & Planning. Sick Building Syndrome

UNIT II SUSTAINABLE CONSTRUCTION

Sustainable Construction, Three Dimensions. Properties, Uses and Examples of - Primary, secondary and Tertiary Sustainable Materials, Techniques of sustainable construction - technologies and design synthesis and construction methods: solar water heating panels; photovoltaic cells etc. **9**

UNIT IIIRECYCLING AND REUSE

9

Reuse - Waste prevention, Pre building, Post building stages, Construction and Demolition recycling- Conservation of natural and building resources- types of wastes. Sourcing and recycling of building materials. Elimination of waste and minimize pollution - various Decomposing methods -environmental monitoring and testing during construction- Design facility within social and environmental thresholds-Case study of local natural body that is polluted and suitable design system to rehabilitate the same.

UNIT IV BUILDING INFRASTRUCTURE 9

Active Energy Systems in buildings, Utilities andservices,building automation. Electro-mechanical systems, lifts and transportation, captivepower plant and equipment, operation & maintenance

UNIT V RATING SYSTEMS 9

Introduction to building rating systems: building auditing, points system,components, and weight age, agencies and institutions like -LEED, BREEAM, Green Star, HQE Rating system, IGBC, GBC, TERI GRIHA etc, and Discussion of green buildings in the contexts with case examples.

TOTAL SESSIONS: 45

TEXT BOOKS

1. Bose B.C., "Integrated approach to sustainable Development". Publishers: Rajat Publications, Delhi, 2007
2. Laurie Baker's, "Chamoli Earthquake hand book", Publishers: Costford, centre of science and technology for rura development, 2000.

REFERENCES:

1. Fuller Moore, "Environmental control systems Heating, Cooling, Lighting". Publisher MC.Graw Hill, Newyork, 1992

2. Caring A.Langston Grace K.C.Ding, "Sustainable practices in built environment", 2nd Edition, Publishers: Butterworth-Heinmann Linacre House Jordanhill Oxford, 2001

3. Trivedi.R.N. Environmental Sciences, Publishers:Anmol Publications Pvt Ltd, New Delhi, 1997

COURSE OUTCOMES:

- The students are exposed to integrate sustainable planning and building principles in architectural design.
- Have a comprehensive knowledge on the evolution and impact of environmental aspects and sustainable issues.
- Be equipped to handle the architectural design process from the studies, analysis, interpretation and design in accordance to the case studies done on the green building concepts.
- Have a knowledge on the Government policies and actions towards the Sustain able society and the latest technologies involved in the Building process
- Have knowledge on the organic and sustainable Building materials used in the design and execution