

DEPARTMENT OF ENVIRONMENTAL SCIENCE

Vision

Empowering and emancipating students through an understanding of the environment, sustainability and related ethical issues.

Mission

Our mission is to develop environmentally conscious citizens who are able to appreciate the environment in its totality. We strive to equip our students with motivation, attitude, sound knowledge, commitment and skills to actively participate, at various levels, in sustainably managing environmental issues.

ES OE1: ENVIRONMENT AND SUSTAINABLE AGRICULTURE

Number of Theory Credits	Number of lecture hours/ semester
3	42

Content of OPEN ELECTIVE Theory Course	42Hrs
Unit – 1	14
Environment – Definition, scope and significance. Agriculture – Definition, scope and significance. Environmental basis for agriculture and food. Agricultural patterns in India. Socio-economic pressures on agriculture. Food security and food scarcity. Types of agriculture – rain-fed cultivation and irrigation – water intensive agriculture – Reservoirs and ground water exploitation. Conventional and mechanised agriculture. Natural and chemical agriculture. Subsistence and commercial agriculture. Environmental effects of land use and landscape changes.	
Unit - 2	14
Environmental determinants of agriculture – role of rainfall, humidity, wind, topography and edaphic factors in crop selection. Animal husbandry – Dairy and poultry – role of transboundary species of cattle in Indian scenario. Pisciculture – Environmental effects of intensive pisciculture. Agricultural biodiversity: Crop diversity – Definition and significance. Poly culture and mono culture. Influences of green revolution on modern agricultural practices of India – Loss of agrobiodiversity – Influence of transboundary crops. Agricultural biotechnology – Genetically Modified Crops – Influence on environment. Pollination crisis. Integrated pestmanagement.	

Unit - 3	14
<p>Environmental impacts of agriculture – Loss of biodiversity – soil salinity – fertiliser and pesticide pollution, Climate change and global warming. Erosion and problems of deposition in irrigation systems. Desertification. Biomagnification – Case studies.</p> <p>Contemporary issues and management – Farmer distress – market mechanisms – natural farming methods/organic farming. Urban agriculture and hydroponics.</p> <p>Ecological principles of farming – Sustainable agriculture – Significance of indigenous crops and cattle varieties. Watershed management. Agricultural policies of India.</p>	

References

Altieri, M. A. (2018). Agroecology: the science of sustainable agriculture. CRC Press.

Campanhola, C., & Pandey, S. (Eds.). (2018). Sustainable food and agriculture: An integrated approach. Academic Press.

de Zeeuw, H., & Drechsel, P. (Eds.). (2015). Cities and agriculture: Developing resilient urban food systems. Routledge.

Eric Lichtfouse, Mireille Navarrete, Philippe Debaeke, SouchereVeronique, Caroline Alberola. (2009). Sustainable Agriculture. Springer Science & Business Media.

Kazim B. Rahim Debash Sarkar Bidhan Chand. (2012). Sustainable Agriculture and Environment. New Delhi Publishers.

Satyanarayana, T., Johri, B. N., & Prakash, A. (Eds.). (2012). Microorganisms in sustainable agriculture and biotechnology. Springer Science & Business Media.

Songstad, D. D., Hatfield, J. L., & Tomes, D. T. (Eds.). (2014). Convergence of food security, energy security and sustainable agriculture (Vol. 67). New York: Springer.