1. Name of the Department: Environmental Science						
2. Course Name	**Agroecology and Agroforestry**			**L**	**T**	**P**
3. Course Code	**ES303**			3	1	0
4. Type of Course (use tick mark)		**Core (☑)**	**DSE ()**	**AEC ()**	**SEC ()**	**OE ()**
5. Pre-requisite (if any)	10+2 with Physics, Chemistry & Biology	**6.(use tick marks)**	Even ()	Odd (☑)	Either Sem ()	Every Sem ()
7. Total Number of Lectures, Tutorials, Practicals						
Lectures = 30		**Tutorials = 10**		**Practical = Nil**		

Provide general introduction about Agroecology and Agroforestry To learn about fundamentals, concepts and principles of Agroforesrty To develop silvicultural systems in Agroforestry and their management with its formulation and objectives To learn about concept and principle of Agroecology with its Agroecological practices To provide knowledge about Agro-ecological basis for the conversion to organic movements

9. COURSE OUTCOMES (CO):

r the successful course completion, learners will develop following attributes:

COURSE OUTCOME	ATTRIBUTES
CO1	Knowledge of Agroecology and Agroforestry
CO2	Knowledge about scope of global and national needs for Agroforestry with its practices
CO3	To understand silvicultural systems in Agroforestry and selection of tree species for Agroforestry
CO4	To understand the principle of Agroecology and its role in ecological agriculture
CO5	To learn the conversion of organic movements for crop rotation, crop diversity and enhance soil health

10. Unit wise detailed content

Unit-1	**Number of lectures** = 08	**Title of the unit:Introduction to Agro-ecology & Agro-forestry**

Basic Terms: Agriculture, Ecology, Environment, Agro-ecology, Forestry and Agro-forestry, Silvilculture, Agronomy, Tree Improvement.

Unit-2	**Number of lectures =08**	**Title of the unit: Concepts in Agroforestry**

Fundamental concepts in Agroforestry: Scope, global and national needs for Agroforestry: Principles of mixed cropping, multiple cropping and inter-cropping. Agroforestry systems and practices for various agro-climatic zones of India. Role and scope of genetics in tree improvement. Sexual and asexual propagation, genetic variability in trees.

Unit-3	**Number of lectures = 08**	**Title of the unit: Silvicultural systems in Agroforestry and their Management**

Silvicultural systems: Introduction, definitions, scope, classification, formulation and objectives. Clear felling systems and their modifications, shelter-wood systems, selection system, coppice system. Selection of trees species for agroforestry systems. Selection of companion crops, intercrops and filler crops in orchards.

Unit-4	**Number of lectures = 08**	**Title of the unit: Concept and Principle of Agro-ecology**

Concept and Principle of Agro-ecology, Agroecological practices and systems, Role of Biodiversity in Ecological Agriculture. Enhancing plant biodiversity for ecological pest management in agro-ecosystems.

Unit-5	**Number of lectures =8**	**Title of the unit: Agro-ecological basis for the conversion to**

Crop rotations, Enhance soil health, crop diversity, indicators of sustainability, agro-ecology and rural movements.

11. CO-PO mapping

Cos	Attributes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	Knowledge of Agroecology and Agroforestry	3	3	3	3	3	3	2
CO2	Knowledge about scope of global and national needs for Agroforestry with its practices	3	3	3	3	3	3	3
CO3	To understand silvicultural systems in Agroforestry and selection of tree species for Agroforestry	3	3	2	2	3	2	3
CO4	To understand the principle of Agroecology and its role in ecological agriculture	3	2	2	3	2	2	3
CO5	To learn the conversion of organic movements for crop rotation, crop diversity and enhance soil health	3	3	3	3	3	3	3

3 Strong contribution, 2 Average contribution , 1 Low contribution

12. Brief description of self learning / E-learning component

https://www.youtube.com/watch?v=iO0ycMkr8lo

13. Books recommended:

- Gliessman, S. R.2002. *Agroecosystem Sustainability: Developing Practical Strategies*. CRC Press
- Kumar, B.M. and Nair P.K.R. (Eds.) 2006.*Tropical Homegardens* :A Time-Tested Example of Sustainable Agroforestry.Series, Advances in Agroforestry , Vol. 3 . Kluwer Academic Publishers, Dordrecht, the Netherlands.
- Lynggaard, K.2006. *The Common Agricultural Policy and Organic Farming: AnInstitutional Perspective on Continuity & Change*. CAB International.
- Nair, P.K.R. 1989. *Agroforestry Systems in the Tropics*, Kluwer, Netherlands.
- Nair, P.K.R. 1993. *An Introduction to Agroforestry*. Kluwer Academic Publishers, Dordrecht, the Netherlands.
- Nair, P.K.R.; Rao M.R. and Buck L.E. (Eds.). 2004. New *Vistas in Agroforestry: ACompendium for 1st World Congress of Agroforestry.* Kluwer Academic Publishers, Dordrecht, the Netherlands.
- Newton, Paul C.D., Carran R.A., Edwards,G.R. Pascal A. and Niklaus.2007.
- *Agroecosystems in a Changing Climate.* Advances in Agroecology Vol.12 CRC/Taylor & Francis.
- Rao, N.J. 2005. *Indian Agriculture: Issues and Perspectives*, ICFAI University Press.
- Singh,J.S., Singh S.P. and Gupta S.R. 2006. *Ecology, Environment and Resource Conservation,* Anamaya Publishers, New Delhi.
- Young, A. 1997. *Agroforestry for Soil Management*, CAB International, UK.