

Semester	Program me & Subject Code	Title of the Course	Hrs/ week	Credit (T + P)	Marks			Total
					Int	Ext		
						T	P	
III	M.Sc. & FS-307	Application of AI and Digital Technologies in Forestry	2	2 (2+0)	20	30	--	50

T-Theory; P- Practical; Int-Internal; Ext-External

Application of AI and Digital Technologies in Forestry

Unit I-

Introduction to Artificial Intelligence (AI) and Machine Learning (ML), and their role in Forestry and Natural Resource Management. Concept of smart forestry and digital forestry. Types of forestry data (remote sensing, field data, climate data). Land cover classification using AI, Image recognition for Tree species identification, Processing LiDAR point clouds using AI to estimate tree height, crown diameter, and volume. Forest Disease detection using AI.

Unit II-

Applications of AI in forest inventory and yield prediction, Biodiversity and carbon stock assessment, Forest Fire Prediction and Management, wildlife monitoring, deforestation and forest health assessment, Predictive modelling for fire risk, and Early warning systems. AI-driven sustainable forest management and smart forestry, autonomous monitoring.

Text Books:

1. Stuart J. Russell and Peter Norvig (2021/2022). Artificial Intelligence: A Modern Approach (4th Edition). Pearson Education.
2. Mohd Nazip Suratman (2022/2023). Concepts and Applications of Remote Sensing in Forestry. (1st Edition) Springer Singapore
3. John R. Jensen (2007), Remote Sensing of the Environment: An Earth Resource Perspective (2nd Edition), Pearson Education.
4. John R. Jensen (2015). Introductory Digital Image Processing: A Remote Sensing Perspective (4th Edition), Pearson.
5. Kanak Moharir Chaitanya B. Pande (2024). Remote Sensing and GIS Application in Forest Conservation Planning (1st Edition), Springer.
6. Kanak Moharir Chaitanya B. Pande (2021). *Advances in Remote Sensing for Forest Monitoring* (1st Edition), Springer.
7. Prasad S. Thenkabail (2024). Remote Sensing Handbook Volume IV: Forests, Biodiversity, Ecology, LULC and Carbon (1st Edition), CRC Press (Taylor & Francis Group).
8. Guojie Wang and Zengxin Zhang (2025). Applications of Artificial Intelligence in Forestry. Forest volume MDPI.