GIS 504: RS AND GIS IN AGRICULTURE AND FORESTRY		
GIS in Agriculture		
Unit 1	**Introduction to Agriculture**: Types of agriculture - Shifting, Subsistence, Extensive, Intensive agriculture, Plantation, Mixed Farming, Commercial Farming, Dry land farming, Wet land farming. Challenges posed to agriculture: Climate Change - Patterns of Temperature and Rainfall, Resource Constraint. Concepts of Agrometeorology: Agro-meteorological stations and automated weather stations.	6 hrs
Unit 2	**Spectral Characteristics of Crop**. Crop Inventory and assessment: Spectral characteristics of crops and Spectral Vegetation Indices; Crop yield modeling and condition assessment. Crop Management: Plant signatures and vitality indicators: Imaging spectroscopy, chlorophyll fluorescence. Cropping pattern & cropping indices analysis, Crop condition and stress assessment, Crop water management. **Crop Monitoring**: Crop area estimation, Crop growth monitoring and Condition Assessment, Crop yield prediction, crop stress detection, Disease identification, Phenological studies.	6 hrs
Unit 3	**Precision agriculture**: Definition, Importance, Components, prospects in Indian agriculture. GPS role in Precision Agriculture. Technologies used in Precision agriculture – Robots, Self-steering tractors, Drones and satellite imagery, Internet of things. Soil Resource Mapping: Soil Quality: Indicators, measurement and assessment, Soil pollution: Soil contamination by heavy metals and Pesticides, Soil Nutrient Management for Precision Agriculture. Irrigation Systems in Agriculture.	6 hrs
Unit 4	**Concept of sustainable Agriculture:** Agricultural Land Use /Land Cover mapping – Visual analysis of satellite data. LULC Mapping and change detection using Remote Sensing Techniques. Impact of LULC change detection on biogeochemical and hydrological cycles. Site suitability for agricultural and horticulture crops. RS and GIS in damage assessment due to cyclone, drought and flood.	6 hrs
GIS in Forestry		
Unit5	Geographical distribution, types, extent and status of vegetation of the World, Asia-Pacific and India. Spectral properties of vegetation and factors affecting spectral reflectance. Spectral vegetation indices, phenology as discriminant for vegetation differentiation and growth.	6 hrs
Unit 6	Forest/Vegetation classification and mapping, Forest inventory and sampling techniques, Growing stock estimation, Biomass estimation, forest management, Fire risk zonation, Land evaluation of forestry, Landscape analysis, Wildlife habitat suitability analysis.	6 hrs
Unit 7	Forest hazards (Deforestation, Degradation and Forest fire), Land and soil degradation, desertification and Pollution (Water, air and soil).	6 hrs
Unit 8	**Remote sensing of forest ecosystem:** Forest change detection using time-series data. Hyperspectral Remote Sensing for species/community delineation, Microwave remote sensing in forestry, LiDAR remote sensing for tree height determination, Biophysical spectral response-based forest canopy density (FCD) mapping. Use of RS and GIS in Forest fire and wildlife habitat assessment. Mapping of forest density and type, issues in forest management. Forest Fire Modeling, Wild Life Habitat Assessment Modeling, Soil Erosion Modeling.	6 hrs