GIH 502: RS AND GIS IN LAND AND WATER RESOURCES		
Unit 1	**Land as a natural resource:** Rocks, minerals, soils, oil and gas, coal. Agriculture land and forest.	6 hrs
Unit 2	**Remote sensing and GIS in Land and Water Resources:** Application of Remote Sensing and GIS in the study of Land and Water Resources. Visual and Digital Techniques in Land and Water Resources Investigations. Selection of appropriate software and data products useful in these resources.	6 hrs
Unit 3	**Water Resources:** Introduction, Concepts of surface Water, Hydrological Cycle. World water distribution, watershed management.	6 hrs
Unit 4	**Hydrogeomorphic studies in Water Resources:** Theory of Geomorphic Controls of Water Resources, Concept of Basin Network Analysis. Surface Run off, Slope Analysis, Applications of DEM in Water Resources, Flood mapping, Quantitative studies of drainage basins.	6 hrs
Unit 5	**Groundwater:** Concepts of Groundwater, Vertical Distribution of Ground water, Types of Aquifers, Rock Properties Affecting Ground water Resources, Lineament studies in Water Resources, Groundwater Resources of India with special reference to Karnataka.	6 hrs
Unit 6	**Theory of Groundwater flow:** Darcy's law and its applications. Groundwater potential assessment, ground water prospect zones mapping and ground water information system.	6 hrs
Unit 7	**Water Resources and Watershed Management:** Concept of River Basin Management, GIS applications in water resources development and management. Concept of Natural Recharge, Concepts in Artificial Recharge, and use of DEM in Artificial Recharge.	6 hrs
Unit 8	**Groundwater development and management:** Planning and management of groundwater. Methods of artificial groundwater recharge; rainwater harvesting, problems of over-exploitation of groundwater; water management in rural and urban areas, geological and geophysical methods of groundwater exploration. **Water Quality** Physical and chemical properties of water, quality criteria for different uses, groundwater provinces of India, Groundwater contamination.	6 hrs

Bibliography

1. David K. Todd, 1980. Groundwater Hydrology, John Wiley & Sons, 5-85.
2. Keith, P. B, 1973. Thompson et al. (ed) Remote Sensing Water Resources Association, Urban Illineis, 27-86.
3. Linsley, Kohler and Paulhus, 1956. Hydrology for Engineers, Mc Graw-Hill, 56-74.
4. Ragunath, H. M. 1987. Ground Water 2nd, Wiley Eastern, 23-65.
5. Subramanian, V. 2002. Water: Quantity-Quality Perspectives, in South Asia. Kingston Intl. Publishers, 34-57.
6. T. M. Lillesand and R. W. Kiefer, 2000. Remote Sensing and Image Interpretation J. Wiley & Sons, 37-66.
7. Thomas G. Lane, 2000. Arc View 3D Analyst, ESRI, Press, 12-43.