

Course Number and Name												
<b>BCE093 - REMOTE SENSING AND GIS</b>												
Credits and Contact Hours												
<b>3 &amp; 45</b>												
Course Coordinator's Name												
Dr.A.Mani												
Text Books and References												
<b>TEXT BOOKS:</b>												
<ul style="list-style-type: none"> <li>Anji Reddy, "Remote Sensing and Geographical Information Systems", BS Publications 2001</li> </ul>												
<b>REFERENCES:</b>												
<ul style="list-style-type: none"> <li>Anand P.H,"Principles of remote Sensing and Geographical Information Systems", Sri Venkateswara Publishers, 2003.</li> <li>Lillesand T.M and Kiefer R.W. Remote sensing and Image, Interpretation, John Wiley and Sons, INC, New York, 1987.</li> <li>Burrough P A,"Principle of GIS for land resource assessment", Oxford University, 1990</li> </ul>												
Course Description												
<ul style="list-style-type: none"> <li>To introduce the students to the basic concepts and principles of various components of remote sensing.</li> <li>To provide an exposure to GIS and its practical applications in civil engineering.</li> </ul>												
Prerequisites						Co-requisites						
Engineering Physics – II						NIL						
required, elective, or selected elective (as per Table 5-1)												
Course Outcomes (COs)												
CO1	Apply the concepts of Electro Magnetic energy, spectrum and spectral signature curves in the practical problems											
CO2	Apply the concepts of satellite and sensor parameters and characteristics of different platforms											
CO3	Apply the concepts of DBMS in GIS											
CO4	Analyze raster and vector data and modeling in GIS											
CO5	Apply GIS in land use, disaster management, ITS and resource information system											
Student Outcomes (SOs) from Criterion 3 covered by this Course												
	COs/SOs	a	b	c	d	e	f	g	h	i	j	k
	CO1				H	H				H		
	CO2				H	H				H		
	CO3				H	H				H		

	CO4				H	H				H		
	CO5				H	H				H		

List of Topics Covered

**UNIT I REMOTE SENSING 9**

Definition Historical Components of Remote Sensing Principles & methods of remote sensing - Active and Passive remote sensing - Remote Sensing platforms -Electro magnetic radiation- Spectrum- Black body radiation – planks law – Stefan – Boltzmann law – satellites classification – based on orbit- sun synchronous and Geosynchronous based on purpose Earth Resources satellites, communication satellite Weather satellites Spy satellites Sensors Description of sensor in landscape, spot, IRS series and current satellites- Radar SLAR-and SAR.

**UNIT II EMR INTERACTIONS 9**

Interaction with atmosphere Scattering of EMR Raleigh, Mie, Non Selective and Raman Scattering Back scattering Speckle EMR Interaction with water and Ozone Atmospheric windows and its significance EMR interaction with the earth surface materials Radiance, irradiance, Absorbed and Transmitting energy – reflectance- Specular- and diffuse surface- Spectral signature – and curves EMR interaction with soil Resolution Spectral, Spatial, Radiometric, and Temporal.

**UNIT III RESOURCES ENGINEERING 9**

Characteristics of Digital satellite image enhancement Filtering Applications of Aerial photographs and satellite imageries – merits – Limitations – Water resources – watershed management – Urban Studies – Flood Management- Fishing Forestry etc.,

**UNIT IV GEOGRAPHIC INFORMATION SYSTEM 9**

GIS – Components of GIS – Hardware, Software and Organisational Context – Data – Spatial and Non-Spatial – Maps – Types of Maps – Projection – Types of Projection - Data Input – Digitizer, Scanner – Editing – Raster and Vector data structures – Comparison of Raster and Vector data structure – Analysis using Raster and Vector data – Retrieval, Reclassification, Overlaying, Buffering – Data Output – Printers and Plotters.

**UNIT V MISCELLANEOUS TOPICS 9**

Visual Interpretation of Satellite Images – Elements of Interpretation - Interpretation Keys Characteristics of Digital Satellite Image – Image enhancement – Filtering – Classification - Integration of GIS and Remote Sensing – Application of Remote Sensing and GIS – Urban Applications- Integration of GIS and Remote Sensing – Application of Remote Sensing and GIS – Water resources – Urban Analysis – Watershed Management – Resources Information Systems