1153CE104 (VTUR15)	FUNDAMENTALS OF REMOTE SENSING AND GIS	L	T	P	C
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COURSE CATEGORY: Allied Elective

A. PREAMBLE :

To understand the principles and engineering applications of remote sensing and Geographical Information Systems.

B. PRE-REQUISITES:

- NIL

C. COURSE EDUCATIONAL OBJECTIVES:

Students undergoing this course are expected to:

- Understand the principles of remote sensing and GIS
- Differentiate the various platforms and sensors used in remote sensing.
- Outline the applications of remote sensing and GIS.

D. COURSE OUTCOMES:

Upon the successful completion of the course, learners will be able to

CO	STATEMENT	K LEVEL
CO1	Explain the fundamentals of remote sensing.	K2
CO2	Infer the different types of platforms and sensors in remote sensing applications.	K2
CO3	Explain the fundamentals of Geographical Information Systems.	K2
CO4	Relate the significances of data base structures in GIS.	K2
CO5	Summarize the engineering applications of remote sensing and GIS.	K2

E. CORRELATION OF COS WITH POS:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	L				H							
CO2	L				H							
CO3	L				H							
CO4	L				H							
CO5	L				H							

F. COURSE CONTENT:

UNIT I FUNDAMENTALS OF REMOTE SENSING 9

Definition - components – Electromagnetic spectrum – wavelength regions important to remote sensing – Wave theory, Particle theory, Stefan-Boltzmann and Wein's Displacement Law – EMR interaction with atmospheric and earth surface – Atmospheric windows – spectral signature concepts – typical spectral reflective characteristics of water, vegetation and soil.

UNIT II PLATFORMS AND SENSORS 9

Types of platforms – orbit types, Sun-synchronous and Geosynchronous – Passive and Active sensors - scanning system**:** Across track and along track scanning – resolution concept – Pay load description of important Earth Resources and Meteorological satellites – Airborne and space borne - TIR and microwave sensors.

UNIT III FUNDAMENTALS OF GIS 9

Map – Definition – Types of Maps, Characteristics of Maps, Map Projections – GIS – Definition - History of GIS - Basic Components of GIS – Hardware, Software, Data, Methods, People – List of GIS Software: Popular software, Open Source software

UNIT IV DATA BASE STRUCTURE 9

Data: Spatial and Non-Spatial Data – Spatial Data: Points, Lines, Polygons/Area and Surface - Non-Spatial Data - Levels of Measurement: Nominal, Ordinal, Interval, Ratio – Data Base Management System: Definition, Functions, Merits and Demerits – Vector and Raster Data Base Structures.

UNITV REMOTE SENSING AND GIS APPLICATIONS 9

Preparation of thematic layers – Integration of data for Surface and groundwater studies - Mineral exploration - Disaster Management: Floods, landslides and coastal zone management studies - highway alignment studies - power and telecommunication utilities - Case studies.

TOTAL: 45 PERIODS

G. LEARNING RESOURCES:

TEXTBOOKS

1. Denison Campbell, Allen and Harold Roper, “Concrete Structures, Materials, Maintenance and Repair”, Longman Scientific and Technical UK, 1991.
2. Allen R.T. & Edwards S.C, Repair of Concrete Structures, Blakie and Sons, UK, 1987

REFERENCES

1. Shetty M.S., "Concrete Technology - Theory and Practice", S.Chand and Company, 2008.
2. Dov Kominetzky.M.S., "Design and Construction Failures", Galgotia Publications Pvt. Ltd., 2001.
3. Ravishankar.K., Krishnamoorthy.T.S, "Structural Health Monitoring, Repair and Rehabilitation of Concrete Structures", Allied Publishers, 2004.
4. CPWD and Indian Buildings Congress, Hand book on Seismic Retrofit of Buildings, Narosa Publishers, 2008**.**
5. Gambhir.M.L., "Concrete Technology", McGraw Hill, 2013