RollNo. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APR / MAY 2025

GEOINFORMATICS
Fourth Semester
GI23405 & HYPERSPECTRAL AND THERMAL REMOTE SENSING
(Regulation 2023)

Time:3hrs Max.Marks: 100

CO1	Understand of the principles of hyperspectral and Thermal remote sensing
CO2	Master in Advanced Processing Tools for hyperspectral and thermal data
CO3	Analyze Hyperspectral and Thermal Data effectively
CO4	Develop the ability to utilize hyperspectral and thermal data for applications
CO5	Integrate theoretical knowledge with practical skills to address complex challenges real world problems through case studies

BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)
(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	Name any two unique characteristics of imaging spectrometry.	2	1	1
2	Interpret the Red Edge shift in relation to plant health.	2	1	2
3	Write the abbreviations of SPECPR, ORASIS, ISIS and ISDAS.	2	2	1
4	What is the purpose of a spectral library in spectral analysis?	2	2	2
5	What is the main demerit of spectral angle mapper?	2	3	1
6	What is the purpose of spectral unmixing?	2	3	2
7	List the thermal properties of terrain.	2	4	1
8	Why is emissivity important in thermal remote sensing?	2	4	2
9	List any two applications of thermal remote sensing in agriculture	2	5	1
10	What is the urban heat island effect?	2	5	2

PART- B(5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No.	Questions	Marks	CO	BL
11 (a)	Explain the Hughe's phenomenon and propose strategies to overcome its limitations in hyperspectral classification.	13	1	2
	OR			
11 (b)	Show how do diffraction principles affects the sensor characteristics, and calibration influence the accuracy of hyperspectral data interpretation	13	1	2
12 (a)	Write the detailed procedure of atmospheric correction of hyperspectral data.	13	2	3

	OR			
12 (b)	Describe the any five open source software for hyperspectral image processing with merits and demerits.	13	2	3
13 (a)	Explain the spectral library coding and matching techniques for hyperspectral image interpretation with sketch.	13	3	3
	OR			
13 (b)	Explain the principles of spectral mixture analysis and endmember extraction in hyperspectral remote sensing.	13	3	3
14 (a) i)	Discuss the principles of thermal infrared radiation and thermal radiation laws.	7	4	3
ii)	Analyze how terrain thermal properties influence the interpretation of thermal imagery.	6	4	3
	OR			
14 (b) i)	Explain the radiometric calibration of thermal images.	7	4	3
ii)	Describe the geometric image degradation techniques.	6	4	3
15 (a)	Evaluate the factors influence the emissivity and describe the important factors should be considered while collecting thermal data.	13	5	4
	OR			
15 (b)	Analyze the method to estimate the land surface temperature (LST) from thermal satellite images.	13	5	4

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	Compare the multispectral, hyperspectral and thermal RS capabilities for analyzing the water quality.	15	5	5