ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

(A Unit of Alva's Education Foundation)

Shobhavana Campus, Mijar-574225, Moodbidri, D.K

Phone: 08258-262725, Fax: 08258-262726

Affiliated to VTU Belagavi and Approved by AICTE, New Delhi, Recognized by Govt. of Karnataka

(Accredited by NAAC with A+ Grade)

VISION

"Transformative education by pursuing excellence in Engineering and Management through enhancing skills to meet the evolving needs of the community"

MISSION

- To bestow quality technical education to imbibe knowledge, creativity and ethos to students community.
- To inculcate the best engineering practices through transformative education.
- To develop a knowledgeable individual for a dynamic industrial scenario.
- To inculcate research, entrepreneurial skills and human values in order to cater the needs of the society.

Week	Month	Days							Activities
		Mon	Tue	Wed	Thu	Fri	Sat	Sun	
1	FEB	13	14	15	16	17	18	19	13 : Commencement of VIII Semester
2		20	21	22	23	24	25	26	
3		27	28						
4	MAR			1	2	3	4	5	20 : Commencement of VI Semester 22nd : Chandramana Ugadi 27 – 31 : Technical Talk/Club and Social Activity 30 - 31 : 1st IA for VIII Semester
5		6	7	8	9	10	11	12	
6		13	14	15	16	17	18	19	
7		20	21	22	23	24	25	26	
8		27	28	29	30	31			
9	APR						1	2	3 : Mahaveera Jayanthi 7: Good Friday 14: Dr B.R. Ambedkar Jayanti 22: Khutha-e-Ramzan 20-21 – Student Mentoring 26 : College Level Project Exhibition 27-28 : 2nd IA for VIII Semester 24– 29 Technical Talk/Club / Social Activity
10		3	4	5	6	7	8	9	
11		10	11	12	13	14	15	16	
12		17	18	19	20	21	22	23	
13		24	25	26	27	28	29	30	
14	MAY	1	2	3	4	5	6	7	1 : Labor day 6 : Sports Day 8-9 : 3rd IA for VIII Semester 13 : Last Working Day of VIII Semester 17 : Commencement of IV Semester 20 : Traditional Day. 22 : College Day Celebration 25 : Commencement of II Semester 26 : Farewell Function to Final Years 22-23 : Student Mentoring 25 - 27 : 1stIA for VI Semester 29-31 : Technical Talk/Club / Social Activity
15		8	9	10	11	12	13	14	
16		15	16	17	18	19	20	21	
17		22	23	24	25	26	27	28	
18		29	30	31					
19	JUN				1	2	3	4	16 To 19 : 2nd IA for VI Semester 26-27 : Student Mentoring 20 - 24 : Technical Talk/Club / Social Activity 28 , 30 & 1st July : 1st IA for IV Semester 30/Jun to 4/July : 1st IA for II Semester 29- Bakrid
20		5	6	7	8	9	10	11	
21		12	13	14	15	16	17	18	
22		19	20	21	22	23	24	25	
23		26	27	28	29	30			
24	JULY						1	2	1-4 : 1st IA for II Semester 5 – 7 : 3nd IA for VI Semester 10 : Last Working Day of VI Semester 17 - 22 : Technical Talk/Club / Social Activity 24-25 : Student Mentoring 29 : Last Day of Moharamm
25		3	4	5	6	7	8	9	
26		10	11	12	13	14	15	16	
27		17	18	19	20	21	22	23	
28		24	25	26	27	28	29	30	
29		31							
30	AUG		1	2	3	4	5	6	4 To 8 : 2nd IA for II Semester 4 To 7 : 2nd IA for IV Semester 15 : Independence Day 24-25 : Student Mentoring 28 - 31 : Technical Talk/Club / Social Activity
31		7	8	9	10	11	12	13	
32		14	15	16	17	18	19	20	
33		21	22	23	24	25	26	27	
34		28	29	30	31				
35	SEP					1	2	3	1 To 5 : 3rd IA for II Semester 8 To 11 : 3rd IA for IV Semester 9 : Last Working Day of II Semester 16 : Last Working Day of IV Semester
36		4	5	6	7	8	9	10	
37		11	12	13	15	16	17	18	

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DEPARTMENT OF CIVIL ENGINEERING

VI SEMESTER TIMETABLE: 2022-23

W.E.F: 20/03/2023

Academic Year	Scheme	Semester	Section	Class Coordinator	Room No.
2022-23	2018	6	A	Mr. Santhosh K	504

Time / Day	9.00 To 9.50	9.50 To 10.40	10.40 To 11.00	11.00 To 11.50	11.50 To 12.40	12.40 To 1.40	1.40 To 2.40	2.40 To 3.40	4.00 To 5.00
MON	HIE (VR)	DSS (DPB)	TEA	QA&QC (VR)	SWM (HGU)	LUNCH BREAK	GT (SKS)	MICRO PROJECT	NCE/ SCM/IDS
TUE	DSS (DPB)	HIE (VR)		GT (SKS)	SWM (HGU)		APT (TEST) (HGU)	HIE (VR)	NCE/ SCM/IDS
WED	HIE (VR)	SAP LAB (DPB/SP)					DSS (DPB)	GT (SKS)	NCE/ SCM/IDS
THU	DSS (DPB)	ENV LAB (SK/RRB)					SWM (HGU)	APT (SKS)	NCE/ SCM/IDS
FRI	DSS (DPB)	SWM (HGU)	BREAK	GT (SKS)	LIBRARY		APT (SKS)	MENTORING	NCE/ SCM/IDS
SAT	GT (SKS)	ESP LAB (SP/SK)					ARCHITECTURE COURSE		

Allocation of Subjects

SUBJECT CODE		SUBJECTS	FACULTY	FACULTY CODE
DSS	18CV61	Design of Steel Structural Elements	Prof. Durgaprasad Baliga	DPB
AGE	18CV62	Applied Geotechnical Engineering	Mr. Shankargiri K S	SKS
HIE	18CV63	Hydrology and Irrigation Engineering	Mr. Varadaraj K S	VR
SWM	18CV642	Solid Waste Management	Dr. H G Umeshchandra	HGU
NCE SCM IDS	18ME651 18ME653 18CS653	Non-Conventional Energy Sources Supply Chain Management Introduction to DATA Structures	Mr. Hemanth Suvarna Mr. Deepak Kotari Dr. Sudheer Shetty	GVB SCP SS
SAP	18CVL66	Software Application Laboratory	Prof. Durgaprasad Baliga Mr. Surendra P	DPB SP
ENV	18CVL67	Environmental Engineering Laboratory	Mr. Ramesh Rao B Mr. Santhosh K	RRB SK
ESP	18CVEP68	Extensive Survey Project	Mr. Surendra P Mr. Santhosh K	SP SK
QA&QC	----	Quality Assurance& Quality Control	Mr. Varadaraj K S	VR
APT	---	APTITUDE	Mr. Shankargiri K S	SKS

Time Table Coordinator

H.O.D.
Dept. of Civil Engineering

Principal
Alva's Institute of Engg. & Tech.

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
Shobhavana Campus, Mijar, Moodabidri, Mangalore Taluk, D.K – 574225
Phone: 08258-262725, Fax: 08258-262726
DEPARTMENT OF CIVIL ENGINEERING

INDIVIDUAL TIMETABLE (EVEN SEMESTER 2022-23)

Name of the Faculty	Dr. H G UMESHCHANDRA					w. e f . 20/03/2023			
Period	1	2		3	4	5	6	7	No. of Units
Time / Day	09.00 – 09.5	09.55 – 10.50		11.00-12.00	11.50-12.40	1.00-2.00	2.30-3.20	3.20-5.00	
Monday					SWM (6TH)			RS & GIS (6TH)	4
Tuesday		4 ENV LAB			SWM (6TH)	APT TEST (6TH)		RS & GIS (6TH)	7
Wednesday								RS & GIS (6TH)	2
Thursday						SWM (6TH)		RS & GIS (6TH)	4
Friday		SWM (6TH)						RS & GIS (6TH)	4
Saturday	4 GEOLOGY LAB								3

LUNCH BREAK

Other Activities: INNOVATIVE & WE AND IIC COORDINATION, RESEARCH & INCUBATION CENTER COORDINATION, EXTERNAL PROJECT FUNDING, OVERALL MOU COORDINATION OF DEPARTMENT, PROJECT WORK COORDINATION (FINAL & MINI), ENGINEERING GEOLOGY LABORATORY INCHARGE, IQAC MEMBER, REVIEW PAPER COORDINATION.

Total Units* **24**

	Hours	Total Hours	Units	Total Units
Theory	4+5	9	18	**24**
Lab	3+2	5	5	
Others	01	01	01	

HOD
Dept. of Civil Engineering
Alva's Institute of Engg. & Technology
Mijar, Moodbidri - 574 225

B. E. CIVIL ENGINEERING
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)
SEMESTER - VI

REMOTE SENSING AND GIS

Course Code	18CV651	CIE Marks	40
Teaching Hours/Week(L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives: This course will enable students to

1. Understand the basic concepts of remote sensing.
2. Analyze satellite imagery and extract the required units.
3. Extract the GIS data and prepare the thematic maps.
4. Use the thematic camps for various applications.

Module-1

Remote Sensing: Basic concept of Remote sensing, Data and Information, Remote sensing data collection, Remote sensing advantages & Limitations, Remote Sensing process. Electromagnetic Spectrum, Energy interactions with atmosphere and with earth surface features (soil, water, and vegetation), Resolution, image registration and Image and False color composite, elements of visual interpretation techniques.

Module-2

Remote Sensing Platforms and Sensors: Indian Satellites and Sensors characteristics, Remote Sensing Platforms, Sensors and Properties of Digital Data, Data Formats: Introduction, platforms- IRS, Landsat, SPOT, Cartosat, Ikonos, Envisat etc. sensors, sensor resolutions (spatial, spectral, radiometric and temporal). Basics of digital image processing- introduction to digital data, systematic errors(Scan Skew, Mirror-Scan Velocity, Panoramic Distortion, Platform Velocity , Earth Rotation) and non-systematic [random] errors(Altitude, Attitude), Image enhancements(Gray Level Thresholding, level slicing, contrast stretching),image filtering.

Module-3

Geographic Information System: Introduction to GIS; components of a GIS; Geographically Referenced Data, Spatial Data- Attribute data-Joining Spatial and attribute data, GIS Operations: Spatial Data Input – Attribute data Management, Geographic coordinate System, Datum; Map Projections: Types of Map Projections, Projected coordinate Systems. UTM Zones.

Module-4

Data Models: Vector data model: Representation of simple features – Topology and its importance; coverage and its data structure, Shape file; Relational Database, Raster Data Model: Elements of the Raster data model, Types of Raster Data, Raster Data Structure, and Data conversion.

Module-5

Integrated Applications of Remote sensing and GIS: Applications in land use land cover analysis, change detection, water resources, urban planning, environmental planning, Natural resource management and Traffic management. Location Based Services And Its Applications.

Course outcomes: After studying this course, students will be able to:

1. Collectdataanddelineatevariouselementsfromthesatelliteimageryusingtheirspectralsignature.
2. Analyze different features of ground information to create raster or vector data.
3. Perform digital classificationandcreatedifferentthematicmapsforsolvingspecificproblems
4. Make decision based on the GIS analysis on thematic maps.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Textbooks:

1. Narayan Panigrahi, "Geographical Information Science", and ISBN 10: 8173716285 / ISBN 13: 9788173716287, University Press2008.
2. Basudeb Bhatta, "Remote sensing and GIS" , ISBN:9780198072393, Oxford University Press2011
3. Kang – T surg Chang, "Introduction to Geographic Information System". Tata McGraw Hill Education Private Limited2015.
4. Lilles and, Kiefer, Chipman,"RemoteSensingandImageInterpretation",Wiley2011.

Reference Books:

1. Chor Pang Lo and Albert K.W Yeung, "Concepts &Techniques of GIS", PHI,2006
2. John R. Jensen, "Remote sensing of the environment", an earth resources perspective–2nd edition– by Pearson Education2007.
3. Anji Reddy M., "Remote sensing and Geographical information system", B. S. Publications2008.
4. Peter A. Burrough, Rachael A. McDonnell, and Christopher D. Lloyd, "Principals of Geo physical Information system", Oxford Publications2004.
5. S Kumar,"Basics of remote sensing & GIS", Laxmi publications 2005.

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ATTENDANCE BOOK

Academic Year : 2022-23

Semester : 6th Section

Period of the Semester : From 20.03.2023 to 10.07.2023

Subject with Code : Remote Sensing & GIS

Name of the Faculty : Dr. H.G. Muralidhara

Department : Civil Engineering

VISION OF THE INSTITUTE

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- To inculcate the best engineering practices through transformative education.
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- To inculcate research, entrepreneurial skills and human values in order to cater the needs of the society.

VISION OF THE DEPARTMENT

To become leader in the field of civil Engineering by imparting quality education in developing highly competant man power and promote researd to meet the current and future challenges in civil Engineering.

MISSION OF THE DEPARTMENT

- To impart knowledge by creating conducive teaching-learning environment.
- To produce civil engineers of high caliber, technical skills and ethical values to serve the society.
- To promote innovation in the minds of future engineers to face the challenges

COURSE OUTCOMES

CO1	Collect data and delineate various elements from the satellite imagery using their spectral signature
CO2	Analyse different features of ground information to create raster or vector data
CO3	Perform digital classification and create different thematic maps for solving specific problems.
CO4	Make decision based on the GIS analysis on thematic maps
CO5	
CO6	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3		2		2		2							2		
CO2	3				2		2						2		2	
CO3	3			2			2					2		2		
CO4	3		2				2									2
CO5																
CO6																

AIET	Lesson Plan & Execution	Format No. Issue No. Rev. No.	ACD 08 01 00

Name of the faculty	Dr. H.G. Mallikarjunaradhya
Semester and Section	6th
Date of Commencement	20.03.2023
Last Working Day of the Semester	10.07.2023
Source Materials List	
1. Anji Reddy	Remote Sensing & GIS
2. S. Kumar	Basics of RS and GIS
3. P.A. Burrough	Principles of Geographical Information systems
4. Lillesand Keifer	RS and Image interpretation.
5. Basudeb Bhatta	RS and GIS
Subject Name	

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
1	20/3	Introduction to Remote sensing	1	Introduction to RS	17/4	1
2	21/3	Basic concepts of Remote sensing	1	Basic concepts of RS	18/4	1
3	22/3	Data processing	1	Data and information	19/4	1
4	23/3	Data Processing	1	data collection by RS Merits & Demerits of RS	20/4	1

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
5	24/3	EMR & EMS	1	EMR, EMS	21/4	1
6	27/3	Energy Interaction with Surface features	1,2	Energy Interaction with Surface features	24/4	1, 2
7	28/3	Resolution Image registration	1, 2	Resolution Image registration	25/4	1, 2
8	29/3	False colour composite	1, 2	False colour composite	25/4	1, 2
9	30/3	Platforms & Sensors	1, 2	Platforms & Sensors	28/4	1, 2
10	31/3	Platforms & sensors elements of VI	4	Platform & sensors elents of VI	02/5	4
11	3/4	Indian Satelites & Sensor Characteristics	2	Indian Satellites & Sensor	03/5	2
12	4/4	Digital data formats	4	Digital Data formats	04/5	4
13	5/4	Sensor Resolutions	4	Systematic Random corrections Radiometric correction	5/5	4
14	6/4	Digital Image processing	4	Digital image processing	9/5	4
15	7/4	Digital Image processing	4	Digital image processing	11/5	4
16	10/4	Image enhancement Systematic & non Systematic errors	4	GIS Introduction	17/5	4
17	11/4	Introductions to GIS	1, 4	GIS Introduction Data models	24/5	1, 4

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
18	12/4	components of GIS explanation	1, 4	Geo referenced data	8/6	1, 4
19	13/4	Georeferenced data	5	Spatial ad attribute dat	9/6	1, 4, 5
20	18/4 19/4	Spatial and attribute data	1, 5	GIS Operations	12/6	1, 5
21	19/4	GIS- operations Spatial data input, attribute data management	1, 5	Geographic coordinate system	13/6	1, 5
22	20/4	Geographic coordinate systems.	1, 5	Geographic coordinate system	14/6	1, 5
23	21/4	Map projections and types	1, 5	Map projections types	15/6	1, 5
24	24/4	Projected coordinate system UTM zones.	1, 5	UTM Zones	20/6	1, 5
25	25/4	Vector data model - Representation of simple features	1, 5	Vector data models	21/6	1, 5
26	26/4	Topology and its importance coverate and its structure	1, 5	Topology	26/6	1, 5
27	2/5	Shape file Relational data base	1, 5	Shape file Relational data base	27/6	1, 5
28	3/5	Raster data model - introduction	1, 5	Raster data structure	28/6	1, 5
29	4/5	Elements of raster data model.	1, 5	Data conversion	28/6	1, 5
30	5/5	Types of Raster data	1, 5	LU/LC Integrated approach of RS & GIS	28/6	1, 5

Period	Plan			Execution		
	Date	Topics to be covered	Source Material needed	Topics Covered	Date	Source Material Referred
31	8/5	Raster data structure	1, 5	change detection studies LU/LC	2/7	1, 5
32	9/5	Data conversion	1, 5	Water resources	4/7	1, 5
33	10/5	Integrated application of RS & GIS - Introduction	1, 5	Urban planning	5/7	1, 5
34	11/5	Application in land use and landcover	1, 5	LU/LC Env. planning	1/7	1, 5
35	15/5	change detection studies	1, 5	Traffic mgmt	7/7	1, 5
36	16/5	water resources	1, 5	Location based services	10/7	1, 5
37	17/5	Urban planning Natural Resources Management	1; 5	—	—	—
38	18/5	Environmental planning	1, 5	—	—	—
39	19/5	Traffic Management	1, 5	—	—	—
40	28/5	Location based services and applications	1, 5	—	—	—
41	24/5	-	-	-		
42	25/5	—	-	-		
43	26/5	—	-	—		

Others	Planned	Actual	Remarks :
Special Classes	-	-	
Tutorials	-	-	
Assignments	3	3	
Seminars	-	-	
IA Tests	3	3	
Portions Covered in the entire Semester	100 %.		
Course Effectiveness			
Students Feedback			
Students Responce			
Result	No. of Students AP	No. of Students Passed	% of Result
	~~29~~ 24	24	100

Faculty in Charge

Signature of Principal (& Remarks if any)

PRINCIPAL
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225, D.K.

HOD's Signature

H.O.D.
Dept. of Civil Engineering
Alva's Institute of Engg. & Tech.
Mijar, Moodbidri - 57[illegible]

ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

MIJAR, MOODBIDRI - 574 225

ATTENDANCE CUM INTERNAL

Class :

Subject : Remote Sensing & GIS

No. of Classes held :

April → ← May → June

Sl. No.	U.S.N.	Name	Date / Month	17	18	19	20	21	24	25	26	28	02	03	04	05	09	11	17	24	8	9	12	13	18	15	20	21	26	27	28	28	No. of Class Attended	% of Attendance	Internal Assessment (25) I	II	III	Average Marks
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
1	20AI020	Keerthana.K		A	A	A	A	A	A	1	2	A	3	4	5	6	A	7	8	9	A	A	10	11	A	A	12	13	14	15	16			27	75	23	28	29(10)	37
2	AI027	Nitin Hemaraj		A	A	A	A	A	1	A	A	A	A	A	A	A	A	8	1	2	A	A	3	A	4	5	6	7	8	9	10	11	12			31	86	21	24	21(10)	32
3	CS001	Abhilash.H		A	A	A	A	A	A	1	2	A	A	A	A	3	A	A	A	A	A	A	A	A	A	A	A	A	A	5	6	7			27	75	24	29	28(10)	37
4	045	Hardik Prabhu		1	2	3	A	A	A	A	A	A	A	A	A	A	A	4	5	A	4	5	A	A	A	A	A	A	A	A	9	10			31	86	24	30	30(10)	38
5	052	James Joseph		1	A	2	A	A	A	A	3	A	A	A	A	A	A	4	5	A	A	4	5	A	6	A	A	7	A	A	A	B	9			31	86.	15	17	22(10)	29
6	054	Jayak Lokesh Koradi		1	2	83	A	4	A	5	6	7	8	9	10	A	A	A	A	11	12	13	14	15	16	17	18	19	20	A	A	21	22			31	86	22	28	29(10)	37
7	055	K.K. Koushik		1	2	A	A	A	A	A	A	A	A	A	A	A	3	4	A	5	6	7	A	A	8	9	A	A	A	A	10	11			34	94	23	30	30(10)	38
8	098	Priya D.B		1	2	3	A	4	A	5	6	7	88	9	10	11	12	13	14	A	15	16	17	18	19	20	A	21	22	23	24	25	26			34	94	22	30	30(10)	38
9	100	Priyanka.V.K		A	1	A	A	A	A	A	2	3	4	5	6	7	8	9	A	A	10	11	12	13	14	15	16	17	18	19	20	21	22			34	94	19	14	28(10)	31
10	113	Rashika		1	2	A	A	A	A	3	4	5	6	A	7	8	9	10	11	A	12	13	14	15	16	17	A	18	19	20	21	22	23			33	91	15	29	29(10)	35
11	129	Bharat Ramand.Naik		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	2	3	4	5	6	7	A	A	A	8	9	10	11			28	78	16	30	25(10)	34
12	20EC006	Aravinda Jogi		A	A	1	2	3	4	5	A	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27			33	90	25	29	30(10)	38
13	012	Disha.H		A	A	A	1	2	3	4	5	6	7	A	A	8	A	9	A	A	A	8	9	10	11	12	13	14	15	16	17	18	19			31	86	19	22	23(10)	32
14	017	Kishan Kumar		A	A	A	1	2	3	4	A	5	6	7	A	A	8	9	10	11	12	13	A	14	15	16	17	8	19	20	21	22	23			33	90	29	30	30(10)	40
15	020	Libina lal		A	A	A	1	2	A	3	A	A	A	4	A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			31	86.7	24	28	29(10)	37
16	029	P.V. Likhita		A	A	A	1	2	3	4	A	5	6	7	8	9	A	A	A	A	A	A	10	11	12	13	14	15	16	17	18	19	20			31	86.7	23	30	28(10)	37
17	037	Praveen		A	A	A	1	2	3	4	A	A	A	A	A	A	A	A	A	A	5	6	7	8	9	10	11	12	13	A	14	A	15	16			31	88.1	25	30	30(40)	39
18	042	Ranjitha.R		A	A	A	1	2	A	3	A	A	A	4	A	5	6	7	8	A	A	A	9	10	11	12	13	14	A	15	16	17	18			31	86.7	18	27	30(10)	35
19	050	Shridevi Rao		A	A	A	1	2	A	3	A	A	A	4	A	5	6	7	8	9	10	11	12	13	14	15	16	17	A	18	19	20	21			31	86.7	12	26	27(10)	32
20	051	Shruthi		A	A	A	1	2	3	4	5	6	7	8	9	10	11	12	13	A	14	15	16	17	18	19	20	21	22	23	24	25			33	90.9	18	28	28(10)	35
21	053	Shwetha		A	A	A	1	2	3	4	5	6	7	8	9	10	12	13	A	14	15	16	17	18	19	20	21	22	A	23	24	25	26			33	90.9	20	30	29(10)	37
22	CS163	TM Bharat Kumar		A	A	A	1	A	A	A	2	A	A	A	3	A	A	A	A	A	4	5	6	7	8	9	A	A	A	A	10	11	12			27	75	0622	29	30(10)	37
23	CS056	Karthikeyan.J		A	A	A	1	2	3	4	A	A	A	A	A	5	A	A	A	A	6	7	8	9	10	11	12	A	A	A	A	13	14	15			34	94	23	30	30(10)	38
24	CS133	Shebin Thomas		1	2	A	A	A	A	A	3	4	5	6	7	8	A	A	A	A	9	10	11	12	13	14	15	A	A	16	17	18	19	20			31	86	06 19	22	26(10)	33
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Staff Initials							A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A							

ALV

ALVA'S INSTITUTE OF ENGINEERIN

AND TECHNOLOGY

MOODBIDRI - 574 225

Class :

Subject : Remote Sensing & GIS

Subject : RS and GIS 18CV651

No. of Classes held :

April

Sl. No.	USN	Name	Date / Month	17	18	1
1	20AJ020	Keerthana. K		A	A	
2	AJ017	Nitin Hemaraj		A	A	
3	CS001	Abhilash. H		A	A	
4	005	Hardik prabhu		1	2	
5	052	James Joseph		1	A	
6	059	Jayak Lokesh Koradi		1	2	
7	055	K.K. Koushik		1	2	
8	095	Priya D.B		1	2	
9	100	Priyanka. V. K		A	1	
10	113	Rashika		1	2	
11	129	Sharat Ramand. Naik		A	A	
12	EC 006	Aravinda Jogi		A	A	
13	012	Disha. H		A	A	
14	017	Kishan Kumar		A	A	
15	020	Libina lal		A	A	
16	029	P. V. Likhita		A	A	
17	037	Praveen		A	A	
18	042	Ranjitha. R		A	A	
19	050	Stridevi Rao		A	A	
20	051	Struthi		A	A	
21	053	Shwetha		A	A	
22	CS163	TM Bharat Kumar		A		
23	CS 056	Karthikeyan. J		A	A	
24	CS 133	Shebin Thomas		1		
25						
26						
27						
28						
29						
30						
Staff Initials						

July

3	4	5	6	7	8																			
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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nts dence cted 60	No. of Class Attended	% of Attendance	Internal Assessment (25) I 27/5	II 19/5	III 7/7	Average Marks
	27	75	23	28	29 (10)	37
	31	86	21	24	21 (8)	32
	27	75	24	29	28 (10)	37
	31	86	24	30	30 (10)	38
	31	86.	16	17	22 (10)	29
	31	86	22	28	29 (10)	37
	34	94	28	30	30 (10)	38
	34	94	22	30	30 (10)	38
	34	94	19	14	28 (10)	31
	33	91	15	29	29 (10)	35
	28	78	16	30	25 (10)	34
	33	91	25	29	30 (10)	38
	31	86	19	22	23 (10)	32
	33	91	29	30	30 (10)	40
	31	86.1	24	28	29 (10)	37
	31	86.1	23	30	28 (10)	37
	31	88.1	25	30	30 (10)	39
	31	86.1	18	27	30 (10)	35
	31	86.1	12	26	27 (10)	32
	33	90.9	18	28	29 (10)	35
	33	90.9	20	30	29 (10)	37
	27	75	0622	29	30 (10)	37
	34	94	23	30	30 (10)	38
	31	86	06 19	22	26 (10)	33
	0	0	0	0	0	0

AIET	ASSIGNMENTS	Format No.	ACD 10
		Issue No.	01
		Rev. No.	00
Department	Civil Engineering	Academic Year	2022-23
		Semester	6th

Sl.No.	Title	Books / Journals / Magazines referred	Date of Announcement	Date of Submission	Signature of the faculty
1	Energy Interaction	Anji	2/5/23	11/5/23	
	with earth	Reddy			
	surface features				
2	Details of	Anji Reddy	»	»	
	electromagnetic				
	spectrum				
3	Elements of	Anji Reddy	»	»	
	visual inter-				
	pretation				
8					
1	Salient features	Anji Reddy		15/6/23	
	LANDSAT, SPOT	Kumar. D.S			
	IRS, INSAT				
2	Details of	Anji Reddy		»	
	sensor resolutions				
3	components of	D.S. Kumar		»	
	GIS				
4	Integration of	Burrough		»	
	spatial and				
	attribute data				
	in GIS				

I

II

III

AIET	INTERNAL EXAM RESULT ANALYSIS		Format No.	ACD 12
			Issue No.	01
			Rev. No.	00

Department	Civil Engineering	Semester	6th
		Subject Code	18CV651
Total No. of Students		Academic Year	2022-23

Test	Date	Number of Students				Signature		Remarks
		Attended	0-14	15-20	21-25	Faculty	HOD	
T_1	27/5	29 ~~27/5~~	-	10	14			
T_2	19/6	24	-	02	22			
T_3	07/07	24	—	-	24			
T_4								
T_5								

Signature of Staff in - charge

HOD's Signature

USN | | | | | | | | | | |

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

(Accredited by NAAC with A+ Grade)

Department of Civil Engineering

Continuous Internal Evaluation Test-3 AY 2022-23

Course Title : **Remote Sensing and GIS**		Course Code: 18CV651
Date: 07/07/2023	Time: 9.30 AM- 11.00 A.M	Semester/Section: VI
Faculty: Dr. H.G. Umeshchandra		Max. Marks: 30

Note: Answer ONE FULL question from each Module.

Q. No.		Questions	Marks	COs	BTL
		Module 4			
1	a)	What things can be represented by point, line and polygon? Explain topological data model to represent area.	8	CO2,3	L2
	b)	What do you understand by spatial data model? Describe conceptual and logical data models for spatial data.	7	CO2,3	L3
		OR			
2	a)	Explain block encoding and quad tree data model.	8	CO2,3	L2
	b)	Explain lattice model and TIN model.	7	CO2,3	L3
		Module 5			
3	a)	Explain the application of remote sensing and GIS in urban planning.	8	CO3,4	L2
	b)	Explain the application of remote sensing and GIS in water resources management.	7	CO3,4	L3
		OR			
4	a)	Enumerate the application of remote sensing and GIS in land cover and land use mapping.	8	CO3,4	L3
	b)	Explain the application of remote sensing and GIS in traffic management.	7	CO3,4	L3

Levels of Bloom's Taxonomy

No.	L1	L2	L3	L4	L5	L6
Level	Remember	Understand	Apply	Analyze	Evaluate	Create

Course Outcomes

CO1	Collect data and delineate various elements from the satellite imagery using their spectral signature.
CO2	Analyze different features of ground information to create raster or vector data.
CO3	Perform digital classificationandcreatedifferentthematicmapsforsolvingspecificproblems.
CO4	Make decision based on the GIS analysis on thematic maps.

FACULTY 20/6/2023 IQAC MEMBER IQAC CHAIRMAN

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

Shobhavana Campus, Mijar, Moodabidri, Mangalore Taluk, D.K – 574225

Phone: 08258-262725, Fax: 08258-262726

DEPARTMENT OF CIVIL ENGINEERING

QUESTION PAPER REVIEW REPORT

Continuous Internal Evaluation (CIE) Test: 3 AY 2022-23

Department: Civil Engineering Semester/Section: 6th Max Marks: 30

Course Title: REMOTE SENSING AND GIS Course Code: 18CV651

Date: 14/06/2023 07.07.2023

Faculty: Dr. H.G.Umeshchandra

Qn. No.	Course Outcome (CO)	Bloom's Taxonomy Level	Marks
1a	2,3	L2	8
1b	2,3	L3	7
2a	2,3	L2	8
2b	2,3	L3	7
3a	3,4	L2	8
3b	3,4	L3	7
4a	3,4	L3	8
4b	3,4	L3	7
Total Marks			60

BT Level: L1-Remember, L2-Understand, L3 -Apply, L4 -Analyze, L5- Evaluate, L6- Create

Consolidated Marks for Different BT Levels:

BT Level	Marks for Each Level	% of Marks	Remarks
L2	8	50	–
L3	7	50	

Scrutinizer/Reviewer Remark:

Approved		Approved with Correction		Rejected	
Reason for Rejection					

Dr H Ajith Hebbar

Name & Signature of the Scrutinizer

Date:

Dr H Ajith Hebbar

Name & Signature of the IQAC Coordinator

Date:

Signature of Head of the Department

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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Department of Civil Engineering

Continuous Internal Evaluation Test-3 AY 2022-23

Course Title : REMOTE SENSING AND GIS		Course Code: 18CV651
Date: 07/07/2023	Time: 9.30 AM- 11.00AM	Semester/Section: VI
Faculty: Dr. H.G. Umeshchandra		Max. Marks: 30

CIET-3 SCHEME AND SOLUTION

Q.No	Solution	Marks
1a	A pont is described by a single x-y coordinate pair and by its name or label. A line is described by a set of coordinate pairs by its name or label. A line is built up by its starting and ending coordinate pairs. An area (polygon) is described by a set of coordinate pairs and by its name or label. Topological model: it consists of three elements such as adjacency, containment and connectivity.	Expl 2+6=8
1 b	Spatial data is any type of data that directly or indirectly references a specific geographical area or location. **Conceptual data model:** organizes principle that translate the real world into functional descriptions of hoe phenomena are represented and related to one another. **Logical data model:** it provides the explicit forms of representation. The geographical features can be represented by raster ad vector formats.	Expl.2+5=7
2a	The **block coding** raster storage technique assigns areas that consist of blocks to reduce redundancy. The block coding raster image compression method subdivides an entire raster image into hierarchical blocks. It's an extension of the run-length encoding technique but extends it to two dimensions. **A quadtree** is a tree data structure in which each internal node has up to four children. Quadtrees are most often used to partition a two dimensional space by recursively subdividing it into four quadrants or regions. The regions may be square or rectangular, or may have arbitrary shapes.	Expl.4+4=8
2b	**Lattice model:** A representation of a surface using an array of regularly spaced sample points (mesh points) that are referenced to a common origin and have a constant sampling distance in the x and y directions. **TIN model**: Triangulated Irregular Network represents a topographic elevation surface by a tessellation of non-overlapping triangles, with elevations at their corners. Three-dimensional visualizations are readily created by the rendering of the triangular facets. In regions where there is little variation in surface height, the points may be widely spaced whereas in areas of more intense variation in height the point density is	Expl.7

	increased	
3a	The application of GIS in urban planning helps in the analysis, storage, and manipulation of both the physical, economic and social data provided in a city. This allows planners to adopt and use the available mapping functions in analyzing the situation at hand in the city. In urban planning, there is the usage of map overlay analysis, which applies GIS in the identification of the areas of conflict of the land development. In addition to that, area which is considered environmentally sensitive are identified using other relevant environmental information, and remote sensing technique. The information provided helps in making informed decisions, which will affect both the current and the future planning of an area.	Expl.8
3b	1. **Storage and management of geospatial data:** Geographic information Systems keep data and records about water sources. 2. **Hydrologic management:** Studies on the water have shown that water is in most cases under motion, or changes its state and pressure with time. GIS comes to play a big part in keeping track of these water conditions. 3. **Modeling of groundwater: Groundwater** modeling involves the hydrologists trying to understand groundwater behavior and characteristics. 4. **Quality analysis of water**: Not all water that exists on earth is safe for consumption by human beings or animals. Taking unsuited water can lead to adverse health conditions. Through GIS, studies on a slope, drainage features, and land utilization patterns can be used to predict whether the water in a given area is safe. Due to the ability of GIS to handle large amounts of data sets, sample data can be processed, stored as well as reports generated. 5. **Water supply management:** As we have seen earlier rain is a handy resource that no government or individual can afford to waste. Water supply pipes are laid on the ground and can be monitored on a real-time basis. 6. **Sewer system management:** Most of the human waste in most parts of the world are treated and conveyed to water bodies. 7. **Stormwater control and Floods disaster management:** During floods and storms, it is most likely that water will accumulate in places inhabited by human beings.	Expl 7
4a	Land cover includes forest, vegetation, soil, water bodies, grassland, and snow. Remote sensing is applied in land cover to provide a synoptic view and multi-temporal data for land use and land cover mapping. Remote sensors identify land cover to provide a baseline for performing monitoring activities. Below are some of the applications of remote sensing in land cover. 1. Land Use and Land Cover Change Analysis 2. Environmental Degradation Monitoring	Expl.8

	3. Natural Resource Management 4. Wildlife Habitat Protection 5. Climate Change Monitoring 6. Monitoring Changes in the Pattern of Land Use and Land Covers 7. Soil Characteristics 8. Inventorying Potential Landslides 9. Assessment of Terrain Stability 10. Oceanography and Oil Spills 11. Studying Geology of the Earth Surface 12. Topography 13. Vegetation Mapping and Monitoring 14. Land Use Monitoring 15. Environmental Management of Land Covers	
4b	GIS data can also be transformed into functional road models for large-scale traffic simulation. GIS data can model road networks around the world as poly lines with attributes. Roadmaps from the GIS database can be extrapolated to automatically create geometrically correct and topologically consistent 3D models of large-scale road networks to be readily used in a real-time traffic simulation, interactive visualization of the virtual world, and autonomous vehicle navigation. The resulting model representation could also provide important road features for traffic simulations, including smoothly connected ramps, highways, overpasses, legal merge zones, and intersections.	Expl.7

30/6/23

FACULTY

IQAC MEMBER

IQAC CHAIRMAN

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ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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Department of Civil Engineering

Continuous Internal Evaluation Test-2 AY 2022-23

Course Title : **Remote Sensing and GIS**		Course Code: 18CV651
Date: 19/06/2023	Time: 9.30 AM- 11.00 A.M	Semester/Section: VI
Faculty: Dr. H.G. Umeshchandra		Max. Marks: 30

Note: Answer ONE FULL question from each Module.

Q. No.		Questions	Marks	COs	BTL
		Module 3			
1	a)	Define GIS. Describe the key components of GIS.	8	CO3	L2
	b)	What do you understand by spatial data and attribute data? How are they integrated to make GIS?	7	CO3	L3
		OR			
2	a)	Give a detailed account of types of map projections.	8	CO3	L2
	b)	Give a detailed account of GIS operations.	7	CO3	L3
		Module 4			
3	a)	Differentiate between raster data and vector data	8	CO4	L2
	b)	Explain object based vector model and spaghetti model.	7	CO4	L3
		OR			
4	a)	Explain DIME model and topological model.	8	CO4	L3
	b)	Explain run length encoding and block encoding.	7	CO4	L3

Levels of Bloom's Taxonomy

No.	L1	L2	L3	L4	L5	L6
Level	Remember	Understand	Apply	Analyze	Evaluate	Create

Course Outcomes

CO1	Collect data and delineate various elements from the satellite imagery using their spectral signature.
CO2	Analyze different features of ground information to create raster or vector data.
CO3	Perform digital classificationandcreatedifferentthematicmapsforsolvingspecificproblems
CO4	Make decision based on the GIS analysis on thematic maps.

Chairman

Faculty

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Phone: 08258-262725, Fax: 08258-262726
DEPARTMENT OF CIVIL ENGINEERING

QUESTION PAPER REVIEW REPORT

Continuous Internal Evaluation (CIE) Test: 2 AY 2022-23

Department: Civil Engineering Semester/Section: 6th Max Marks: 30

Course Title: REMOTE SENSING AND GIS Course Code: 18CV651

Date: 14/06/2023

Faculty: Dr. H.G.Umeshchandra

Qn. No.	Course Outcome (CO)	Bloom's Taxonomy Level	Marks
1a	3	L2	8
1b	3	L3	7
2a	3	L2	8
2b	3	L3	7
3a	4	L2	8
3b	4	L3	7
4a	4	L3	8
4b	4	L3	7
Total Marks			60

BT Level: L1-Remember, L2-Understand, L3 -Apply, L4 -Analyze, L5- Evaluate, L6- Create

Consolidated Marks for Different BT Levels:

BT Level	Marks for Each Level	% of Marks	Remarks
L2	8	50	–
L3	7	50	

Scrutinizer/Reviewer Remark:

Approved	✓	Approved with Correction		Rejected	
Reason for Rejection	—				

Dr H Ajith Hegde

Name & Signature of the Scrutinizer

Date: 14/6/23

Dr H Ajith Hegde

Name & Signature of the IQAC Coordinator

Date: 14/6/23

Department of Civil Engg.
Alva's Institute of Engg. & Technology
Shobhavana Campus, Mijar
MOODBIDRI - 574225, D.K.

14/6/23

Signature of Head of the Department

H.O.D.
Dept. of Civil Engineering
Alva's Institute of Engg. & Technology
Mijar, Moodbidri - 574 225

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DEPARTMENT OF CIVIL ENGINEERING

IA - 2 SCHEME

Sem:6th Sub: Remote Sensing and GIS Sub Code:18CV651

Date: 19/06/2023 Time: 9.30-11.00 Max Marks:30

Module Covered: 3, 4 CO's Covered: 3, 4

Q. No.	Description	Marks
1a	Components of GIS: Hardware, software, people, methods, data, space segments, control segment, user segment	Expln 8
1b	spatial data: The data which include geographic location information of a point, line or polygon object. Such as an address, coordinate. Describes the absolute and relative location of geographic features. Attribute data: The data which include any other non-location information related to a point, a line, or a polygon. Describes characteristics of the spatial features. These characteristics can be quantitative and/or qualitative in nature. Attribute data is often referred to as tabular data.	4+3=7
2a	**Planar, Azimuthal or Zenithal projection** This type of map projection allows a flat sheet to touch with the globe, with the light being cast from certain positions, including the centre of the Earth, opposite to the tangent area, and from infinite distance. This group of map projections can be classified into three types: Gnomonic projection, Stereographic projection and Orthographic projection. **Conic projection** This type of projection uses a conic surface to touch the globe when light is cast. When the cone is unrolled, the meridians will be in semicircle like the ribs of a fan. The tangent areas of conic projection can be classified as central conical projection or tangent cone, secant conical projection, and polyconic projection. **Cylindrical projection** This type of projection uses a cylinder as a tangent surface that wraps around a globe, or to intersect the globe at certain positions. If the cylinder is unrolled into a flat sheet, the parallels and meridians will be straight lines that create the right angles where they intersect each other. The projection displays directions and shapes	Expln 8

	correctly. The area close to tangent points will be more accurate. The more distant it is from tangent points, the more distortion will be shown. This type of projection is typically used to map the world in particular areas between 80 degrees north and 80 degrees south latitudes.	
2b	Frame the question, Explore and prepare data, Choose analysis methods and tools, Perform the analysis, Examine and refine results.	Expl 7
3a	**Raster data** is made up of pixels (or cells), and each pixel has an associated value. Simplifying slightly, a digital photograph is an example of a raster dataset where each pixel value corresponds to a particular colour. In GIS, the pixel values may represent elevation above sea level, or chemical concentrations, or raintall etc. The key point is that all of this data is represented as a grid of (usually square) cells. The difference between a digital elevation model (DEM) in GIS and a digital photograph is that the DEM includes additional information describing *where* the edges of the image are located in the real world, together with how big each cell is on the ground. This means that your GIS can position your raster images (DEM, hillshade, slope map etc.) correctly relative to one another, and this allows you to build up your map. **Vector data** consists of individual points, which (for 2D data) are stored as pairs of (x, y) co-ordinates. The points may be joined in a particular order to create lines, or joined into closed rings to create polygons, but all vector data fundamentally consists of lists of co-ordinates that define vertices, together with rules to determine whether and how those vertices are joined.	8
3b	Spaghetti model: One could envision each line in this model to be a single strand of spaghetti that is formed into complex shapes by the addition of more and more strands of spaghetti. It is notable that in this model, any polygons that lie adjacent to each other must be made up of their own lines, or stands of spaghetti. In other words, each polygon must be uniquely defined by its own set of X, Y coordinate pairs, even if the adjacent polygons share the exact same boundary information. This creates some redundancies within the data model and therefore reduces efficiency.	7

	DIME: GDF/DIME (Geographic Base File/ Dual Independent Map Encoding) from US GBF/DIME Model p g) Census Bureau, Each street, river, railroad line etc is represented as a series of straight line segments, Usage: – Digitally storing street maps – Providing geographically referenced address information in computerized form	
4a	The block coding raster storage technique assigns areas that are blocks to reduce redundancy.The block coding raster image compression method subdivides an entire raster image into hierarchical blocks. It's an extension of the run length encoding technique, but extends it to two dimensions. Quadtrees are raster data structures based on the successive reduction of homogeneous cells. It recursively subdivides a raster image into quarters. The subdivision process continues until each cell is classed.	8
4b	Topology in GIS is generally defined as the spatial relationships between adjacent or neighboring features. The standard notion of topology in GIS centers around explicit representation of adjacent spatial relations and involves planar enforcement of geographic features. Although shapefiles do not explicitly store spatial relations, they can conform to planar enforcement. If, during map production or editing, planar enforcement is violated, then statistical summations that assume space-filling polygons could be inaccurate.	7

16/6/23

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ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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Department of Civil Engineering

Continuous Internal Evaluation Test-1 AY 2022-23

Course Title : **Remote Sensing and GIS**		Course Code: 18CV651
Date: 27/05/2023	Time: 9.30 AM- 11.00AM	Semester/Section: VI
Faculty: Dr. H.G. Umeshchandra		Max. Marks: 30

Note: Answer ONE FULL question from each Module.

Q. No.		Questions	Marks	COs	BTL
		Module 1			
1	a)	Give an account of basic concepts of remote sensing.	8	CO1	L2
	b)	Explain the Electromagnetic spectrum with a neat sketch.	7	CO1	L3
		OR			
	a)	Give a detailed account of energy interaction with atmosphere and earth surface features.	8	CO1	L2
	b)	Write the advantages and limitations of remote sensing techniques.	7	CO1	L3
		Module 2			
3	a)	Give a detailed account of platforms and sensors	8	CO2	L2
	b)	Write a note on systematic and non systematic errors.	7	CO2	L3
		OR			
4	a)	Give an account of sensor resolutions.	8	CO2	L2
	b)	Write a note on contrast stretching and image filtering.	7	CO2	L3

Levels of Bloom's Taxonomy

No.	L1	L2	L3	L4	L5	L6
Level	Remember	Understand	Apply	Analyze	Evaluate	Create

Course Outcomes

CO1	Collect data and delineate various elements from the satellite imagery using their spectral signature.
CO2	Analyze different features of ground information to create raster or vector data.
CO3	Perform digital classificationandcreatedifferentthematicmapsforsolvingspecificproblems
CO4	Make decision based on the GIS analysis on thematic maps.

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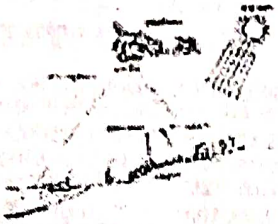
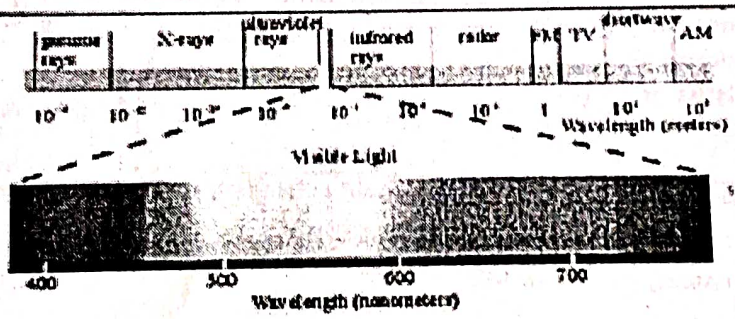
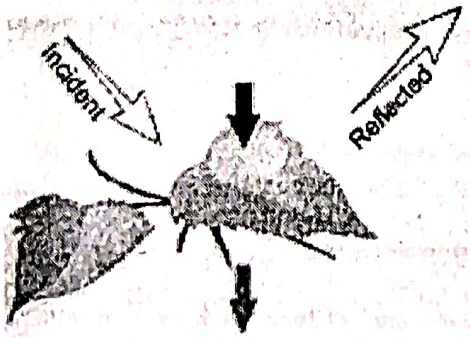
DEPARTMENT OF CIVIL ENGINEERING

IA - 1 SCHEME

SEM: 6th Sub: Remote Sensing and GIS Sub Code: 18CV651

Date: 27/05/2023 Time: 9.30-11.00 Max Marks: 30

Module Covered: 1, 2 CO's Covered: 1, 2

Q. No.	Description	Marks
1.a	 1. Energy source, 2. prpogation of ebergy through the atmosphere 3. Energy interaction with earth's surface features 4. Airborne/ space borne sensors 5. Transmission of data to earth's surface	8
1.b	 Expln each wavelength band	7
2.a	 Incident energy, reflected energy, Absorbed energy and transmitted energy (explanation with the figure	8
2.b	Advantages of Remote sensing 1. Large area coverage: Remote sensing allows coverage of very large areas which enables regional surveys on a variety of themes and identification of extremely large features. 2. Remote sensing allows repetitive coverage which comes in handy when	7

	collecting data on dynamic themes such as water, agricultural fields and so on. 3. Remote sensing allows for easy collection of data over a variety of scales and resolutions. 4. A single image captured through remote sensing can be analyzed and interpreted for use in various applications and purposes. There is no limitation on the extent of information that can be gathered from a single remotely sensed image. 5. Remotely sensed data can easily be processed and analyzed fast using a computer and the data utilized for various purposes. **Disadvantages of remote sensing:** 1. Remote sensing is a fairly expensive method of analysis especially when measuring or analyzing smaller areas. 2. Remote sensing requires a special kind of training to analyze the images. It is therefore expensive in the long run to use remote sensing technology since extra training must be accorded to the users of the technology. 3. It is expensive to analyze repetitive photographs if there is need to analyze different aspects of the photography features. 4. It is humans who select what sensor needs to be used to collect the data, specify the resolution of the data and calibration of the sensor, select the platform that will carry the sensor and determine when the data will be collected. Because of this, it is easier to introduce human error in this kind of analysis. 5. Powerful active remote sensing systems such as radars that emit their own electromagnetic radiation can be intrusive and affect the phenomenon being investigated.	
3.a	1. Airborne platforms 2. Space borne platforms 3. Ground borne platforms 1. Active sensors 2. Passive sensors	Expln. 8
3.b	Systematic error usually occurs when an instrument measuring the data is faulty. Random errors are usually caused by unknown incidents. Random errors are usually caused by unknown incidents. Systematic Errors: • It is a constant error which remains same for all the measurements. • Incorrect calibration and incorrectly using the apparatus • By improving the design of the apparatus. • Magnitude of error is Constant • Occur only in one direction. • Three types (Instrument, Environment and systematic error) • Reproducible	7
4.a	There are four major types of resolution in remote sensing: 1. Spatial resolution is dependent on the field of view, altitude, and viewing angle of a sensor. 2. Spectral resolution refers to the number of wavelength regions or bands in the	Expln.8 (2+2)+2 +2)

	electromagnetic spectrum to which the sensor is sensitive. 3. Temporal resolution is a measure of how often data are otained for the same area (how often it is revisited). 4. Radiometric resolution is a measure of the sensitivity of a sensor to differences in the intensity of the radiation measured.	
4.b	**Contrast stretching** (also called Normalization) attempts to improve an image by stretching the range of intensity values it contains to make full use of possible values. Unlike histogram equalization, contrast stretching is restricted to a linear mapping of input to output values. An image filter is a technique through which size, colors, shading and other characteristics of an image are altered. An image filter is used to transform the image using different graphical editing techniques. Image filters are usually done through graphic design. Low pass filters, high pass filters etc.,	Expln.7

24/5/23