Course File

Geographic information System and Remote Sensing (6CE5-16)

Semester: VI Year: III (2023-24)

Name of faculty: Dr. Kuldeep Swarnkar

Email ID: kuldeep.swarnkar@technonjr.org

Total Number of Lectures: 28

INDEX - COURSE FILE

VISSION & MISSION OF INSTITUTE

Vision

Empowering student with recent and emerging technologies to create innovative technical leaders capable of contributing to industrial and societal needs for betterment of mankind across the globe.

Mission

M1: To provide dynamic learning environment to students by providing constant exposure to latest technologies by linking closely with the industries.

M2: To establish effective interface with industry to obtain live problems to enhance critical thinking and problem solving skills among students and consultancy projects for faculty.

M3: To provide avenues and opportunities to faculty for domain specific trainings and qualification upgradation.

M4: To develop ethical leaders with strong communication skills.

VISION & MISSION OF DEPARTMENT

Department Vision

To increase students learning of fundamentals for designing and planning of buildings and latest technologies through industry-aligned project-based learning which will help in transforming students to be good civil engineering professionals leading to innovation and incubation of new ideas.

Department Mission

M1: To create experimental learning through solving problems of Government, Society, Smart Cities, Industry and other entities.

M2: To teach the latest technologies to the students as beyond the syllabus activity so that they are updated and industry ready.

M3: To enable engineering students understand industry-aligned technologies and learn to find solutions from their early engineering days and this is the only way to produce globally relevant engineers solving real-life problems applying current technologies.

M4: To enable students to generate projects through problem faced by and requirement of Smart cities, industry, Government and other entities whereby those outlined problem statements are to be studied deeply by a group of faculty members to convert them into real-time project format.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs 1: To provide an in-depth understanding of the fundamentals of Civil Engineering and create a foundation for lifelong learning to facilitate a progressive career in the construction Industry, as an entrepreneur and in pursuit of higher studies.

PEOs 2: To equip the students with technical and analytical skills to develop innovative solutions to complex real-life problems using existing and novel technologies. To equip the students with good communication and interpersonal skills, inter-disciplinary teamwork and leadership skills to enable them to fulfill professional responsibilities.

PEOs 3: To expose them to various contemporary issues which will enable them to become ethical and responsible towards themselves, co-workers, Society and the Nation.

PEOs 4: To make the student's industry ready by imparting education related to the latest technologies so that they can grab future industry jobs.

PROGRAM SPECIFIC OUTCOMES (PSO's)

PSO1: To be aware of and initiate some-work on future technologies and new developments which may impact the future Industry 4.0.

PSO2: Hands on training on upcoming technologies and project-based learning.

PSO3: Get exposure to BIM (Building Information Modeling).

PROGRAMME OUTCOMES (POs)

A student will develop:

PO01. ENGINEERING KNOWLEDGE: An ability to apply knowledge of Mathematics, Science and Engineering Fundamentals in Electronics and Communication Engineering.

PO02. PROBLEM ANALYSIS: Ability to analyze and interpret data by designing and conducting experiments. Develop the knowledge of developing algorithms, designing, implementation and testing applications in electronics and communication related areas.

PO03. DESIGN/ DEVELOPMENT OF SOLUTION: An ability to Design a system Component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

PO04. CONDUCTION OF INVESTIGATION OF COMPLEX PROBLEMS: Ability to Identify, formulate and solve engineering problems.

PO05. MODERN TOOL USAGE: An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

PO06. THE ENGINEERING AND SOCIETY: Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.

PO07. ENVIRONMENT & SUSTAINABILITY: Understand the impact of professional engineering solution in societal and environmental contexts, and demonstrate the knowledge of, and need of sustainable development.

PO08. ETHICS: An ability to understand the professional, social and ethical responsibility.

PO09. INDIVIDUAL AND TEAM WORK: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. COMMUNICATION: An ability to Communicate effectively in order to succeed in their profession such as, being able to write effective reports and design documentation, make effective presentations.

PO11. PROJECT MANAGEMENT & FINANCE: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in team, to manage projects and in multidisciplinary environment.

PO12. LIFE-LONG LEARNING: Recognize the need and an ability to engage in life-long learning.

Course Overview:

Student will learn basics of RS and GIS from this 28-hour course. They will be able to work on Remote sensing Software and find a **continuous and constant source of information about the Earth**, and geographic information systems (GIS) are a methodology for handling all this geographic data. They will study the spatial distribution of uncertainty in categorical maps. Nowadays Geographic Information System and Remote Sensing are playing a crucial role in our environmental development, raw materials assessment, urbanization, study of watershed, survey and management of cultivable land, study of forestry, geological structure, disaster management and supervision

Rs and Gis is the basic requirement for the job role of Research Engineer in the companies like Geo Climate Risk Solutions, Geo Infosys etc.

Course Outcome:

CO. NO.	Cognitive Level	Course Outcome
1	Synthesis	Student will be able to Understand the basic concept of Remote Sensing and know about different types of satellite and sensors.
2	Application	Student will be able to Apply the concepts of Photogrammetric and its applications such as determination of heights of objects on terrain.
3	Comprehension	Students will be able to Express the principles of aerial and satellite remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies.
4	Analysis	Students will be able Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems
5	Synthesis	Students will be able Develop knowledge on conversion of data from analogue to digital and working with GIS software.

Prerequisites:

- Prepare Geographic Information Systems and the geographic space with concepts and terms commonly used to build operating models in GIS
- Use diverse techniques and instruments adequately to measure, locate and find bearings on a map and in a field.
- Photo-interpret basic environmental and socioeconomic variables using photographs taken in Spain.
- Compute knowledge of remote sensing and GIS in different civil engineering applications.
- Compute an image visually and digitally with digital image processing techniques.

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Mapping COs, POs and PSOs:

Course Outcome	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO36516.1	0	0	0	1	0	2	2	0	0	1	0	1	1	1	0
CO36516.2	0	0	0	1	0	2	2	0	0	1	0	1	1	1	0
CO36516.3	0	0	0	1	0	2	2	0	0	1	0	1	1	1	0
CO36516.4	0	0	0	1	0	2	2	0	0	1	0	1	1	1	0
CO36516.5	0	0	0	1	0	2	2	0	0	1	0	1	1	1	0

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UNIVERSITY ACADEMIC CALENDAR

Academic Calendar for Even Semester for Session

Course : Bachelor of Technology (B.Tech) for Even Semester				
Semester	II	IV	VI	VIII
Commencement of Classes	03-02-2025	02-01-2025	02-01-2025	02-01-2025
First Mid Term	24-03-2025	17-02-2025	17-02-2025	17-02-2025
Second Mid Term	28-04-2025	24-03-2025	24-03-2025	24-02-2025
Last Working Day	10-05-2025	19-04-2025	19-04-2025	19-04-2025
Commencement of Practical Exams	12-05-2025	21-04-2025	21-04-2025	21-04-2025
Commencement of Theory Exams	26-05-2025	06-05-2025	05-05-2025	06-05-2025
Project (VIII)	15-05-2025 to 24-05-2025			
Practical Training (After II Sem.)	16-06-2025 to 30-06-2025			
Practical Training (After IV Sem.)	19-05-2025 to 02-07-2025			
Practical Training (After VI Sem.)	19-05-2025 to 02-07-2025			

ACADEMIC CALENDAR OF INSTITUTE

Academic Calendar for even Semester for Session 2023-24 (Even Semester)

Course: Bachelor of Technology (B.TECH.)				
Semester	**II**	**IV**	**VI**	**VIII**
Commencement of Classes	26-02-2024	15-02-2024	15-02-2024	2-01-2024
Commencement of First Mid Term	20-04-2024	25-03-2024	25-03-2024	15-02-2024
Commencement of Second Mid Term	05-06-2024	24-05-2024	24-05-2024	21-03-2024
Last Working Day	15-06-2024	31-5-2024	31-5-2024	20-04-2024
Commencement of Practical Exams	01-07-2024	04-6-2024	03-6-2024	22-04-2024
Commencement of Theory Exams	19-6-2024	15-6-2024	14-6-2024	02-05-2024
Project (VIII)	06.05.2024 to 15.05.2024			
Practical Training (After II Sem.)	15.07.2024 To 31.07.2024			
Practical Training (After IV Sem.)	01.07.2024 To 17.08.2024			
Practical Training (After VI Sem.)	01.07.2024 To 17.08.2024			

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Evaluation Scheme

FACULTY DETAILS:

Name of the Faculty : Dr. Kuldeep Swarnkar

Designation : Assistant Professor

Department : Civil Engineering

1. TARGET

a) Percentage Pass : 100 %
b) Percentage I class: 70 %

2. METHOD OF EVALUATION

2.1. Continuous Assessment Examinations (Mid-Term 1 & 2)

2.2. Assignments / Seminars

2.3. Mini Projects

2.4. Quiz

2.5. Semester Examination

Others_____

3. List out any new topic(s) or any innovation you would like to introduce in teaching the subject in this Semester.

1. Take the help of creative tools to stimulate creativity. Include slide presentations, demonstration or forms of visual exercises that will excite the young minds and capture their interest.

Signature of Faculty: **Signature of HOD**

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UNIVERSITY SYLLABUS

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

3rd Year - VI Semester: B.Tech. (Civil Engineering)

6CE5-16: GEOGRAPHIC INFORMATION SYSTEM & REMOTE SENSING

Credit: 2 **Max. Marks: 100(IA:30, ETE:70)**

2L+0T+0P **End Term Exam: 3 Hours**

SN	CONTENTS	Hours
1	**Introduction:** Objective, scope and outcome of the course.	1
2	**Photogrammetry:** Definition of Photogrammetric Terms, Geometry of aerial and terrestrial photographs,Aerial camera and photo-theodolite, Scale of a Photograph, Tilt and Height displacements, Stereoscopicvision and stereoscopes, Height determination from parallax measurements, Flight planning, Maps andMap substitutes and their uses.	7
3	**Remote Sensing:** Introduction and definition of remote sensing terms, Remote Sensing System, Electromagnetic radiation and spectrum, Spectral signature, Atmospheric windows.	4/6
4	Different types of platforms, sensors and their characteristics, Orbital parameters of a satellite, Multiconcept in Remote Sensing.	4/4
5	**Image Interpretation:** Principles of interpretation of aerial and satellite images, equipments and aidsrequired for interpretation, ground truth – collection and verification, advantages of multidate andmultiband images. Digital Image Processing concept.	6/5
6	**Geographic Information System (GIS) :** Introduction & applications of GIS in map revision, Land use,Agriculture, Forestry, Archaeology, Municipal, Geology, water resources, Soil Erosion, Land suitabilityanalysis, change detection.	6/5
	TOTAL	28

TEXT/REFERENCE BOOKS

1. Floyd F. Sabins, Remote Sensing Principles and Interpretation, W.H. Freeman and Co.2007.

2. Lillisand T.M and Kiefer R.W, Remote Sensing and Image Interpretation, John Wiley and Sons, 2008.

3. Paul R. Wolf: Elements of Photogrammetry, with Air Photo Interpretation and Remote Sensing, McGraw Hill International Book Company, 2000

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WEEKLY TIME TABLE OF THE TEACHER

First Time Table: with effect from (Date): Effective from 15 Feb. 2024

Day	1	2	3	4	5	6	7
Monday						GIS	GIS
Tuesday		GIS					GIS
Wednesday							
Thursday							
Friday							
Saturday							

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COURSE-PLAN

Lect. No.	Unit	Topics	Teaching methods
1.	**1**	**Introduction:** objective, scope and outcome of the course	White board, ppt,
2.	**2**	Photogrammetry: Definitions etc. Aerial and terrestrial photographs	White board, ppt, demonstration
3.	2	Aerial camera and photo theodolite, scale of a photograph	White board
4.	2	Tilt and height displacements, stereoscopic vision and stereoscopes	White board
5.	2	Height determination from parallax measurements	White board
6.	2	Flight planning	White board, ppt
7.	2	Maps and map substitutes and their uses	White board
8.	**3**	**Remote sensing:** introduction & definition of remote sensing terms	White board
9.	**3**	Remote sensing system	White board, ppt
10.	**3**	Remote sensing system	White board
11.	**3**	Electromagnetic radiation and spectrum	White board
12.	**3**	Spectral signature, atmospheric windows	White board, ppt,
13.	**4**	Different types of platforms, sensors and their characteristics	White board
14.	**4**	Different types of platforms, sensors and their characteristics	White board, ppt, demonstration
15.	**4**	Orbital parameters of a satellite	White board
16.	**4**	Multi concept in remote sensing	White board

17.	**5**	**Image interpretation**: principles of interpretation of aerial and satellite images.	White board
18.	**5**	Equipment's and aids required for interpretation	White board
19.	**5**	Ground truth – collection and verification	White board, ppt
20.	**5**	Advantages of multidate and multiband images	White board
21.	**5**	Digital image processing concept	White board, ppt
22.	**6**	**I**ntroduction & Applications of gis in map revision	White board
23.	**6**	Geographic information system (gis)	White board, ppt,
24.	**6**	Geographic information system (gis)	White board
25.	**6**	Land use, agriculture, forestry, archaeology, municipal	White board, demonstration
26.	**6**	Geology, water resources, soil erosion	White board
27.	**6**	Land suitability analysis, change detection	White board
28.		Revision of course work	White board

TEXT/REFERENCE BOOKS:

1. Fluid Mechanics & Hydraulics by Dr. K.R, Arora, Standard Publishers & Distributers, Delhi.
2. Fluid Mechanics & Hydraulics by Dr. R.K. Bansal, Laxmi Publications (P) Ltd.
3. Fluid Mechanics & Hydraulics by Modi & Seth, Standard Publishers & Distributers, Delhi.
4. Fluid Mechanics & Machinery by C.S.P.Ojha, R.Berndtsson and P.N. Chandramauli, Oxford Publishers, Delhi.

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Assignment Sheet

ASSIGNMENT NO. 1

1. What is Photogrammetric and their types?
2. Write down two advantages of photographic mapping?
3. Equipment needed for photo interpretation?
4. Write Example of active remote sensing?
5. Define Radiometer?
6. Write definition of remote sensing and explain its types also?
7. Explain remote sensing system?
8. Explain ground truth in remote sensing?
9. Write about remote sensing platform?
10. Discuss about application of GIS in urban planning?
11. Write application of GIS water resource?
12. Explain digital image processing and its advantages?
13. Explain Image interpretation and its elements?

ASSIGNMENT NO. 2

1. What is Photogrammetric and their types?
2. Write formula for shadow height method and parallax height measurement?
3. Equipment needed for photo interpreting?
4. What is semi major axis
5. What is eccentricity
6. What is scale of photograph?
7. What is scattering, reflectance and absorption?
8. What do you mean by remote sensing?
9. What is basic difference between active and passive device?
10. Write two disadvantages of remote sensing?
11. Write definition of remote sensing and explain its types also?
12. Please explain atmospheric window?
13. Explain remote sensing system?
14. Explain electromagnetic radiation and its properties?
15. Explain GIS and its applications in details

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SAMPLE QUIZ QUESTIONS

1. Remote sensing uses which of the following waves in its procedure?

   a) Electric field

   b) Sonar waves

   c) Gamma- rays

   d) Electro-magnetic wave
   (D)

2. Which of the following is not a principle of remote sensing?

   a) Interaction of energy with satellite

   b) Electromagnetic energy

   c) Electro-magnetic spectrum

   d) Interaction of energy with atmosphere
   (a)

3. Which of the following is not a principle of remote sensing?

   a) Interaction of energy with satellite

   b) Electromagnetic energy

   c) Electro-magnetic spectrum

   d) Interaction of energy with atmosphere
   (c)

4. Which of the following is not a classification of scattering principle?

   a) Faraday scattering

   b) Rayleigh scattering

   c) Mie scattering

   d) Non-selective scattering
   (a)

5. Which of the following can act as an example for air-borne platform?

   a) LISS-III b) Dakota c) MOS d) LISS-II

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TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR

B. TECH. 3rd – YEAR (VI SEM.) – MT-I

Geographic Information System and Remote Sensing (6CE5-16)

Time: 2 Hours **Max. Marks:** 70

Note:

1) The paper is divided into 2 parts: Part-A and Part-B.
2) Part-A contains 10 questions and carries 2 marks each.
3) Part-B contains 5 questions. Each question has two options and carries 10 marks each.

Part- A (20 Marks)

A.	What is photogrammetry?	CO1
B.	Define scale of a photograph and how to calculate it?	CO1
C.	What are Sun-Synchronous and Geostationary Satellites?	CO1
D.	What is Nadir?	CO1
E.	Define principal point.	CO2
F.	What is a photo theodolite?	CO2
G.	What is difference between large scale and small scale?	CO2
H.	Define electromagnetic radiation.	CO2
I.	What is the relation between ground area and photo area?	CO3
J.	What is the difference between a map and a photograph?	CO3

Part- B (50 Marks)

1. Explain vertical and oblique types of aerial photography.	CO1
OR	
1. What is Stereovision and stereoscope?	CO1

2. Explain image characteristics for visual interpretation.	CO1
OR	
2. Explain aerial and close-range types of photogrammetry.	CO1

3. A study area is 10 km wide in the east-west direction & 16 km long in the north-south direction. A camera having a 152.4 mm focal length lens & 230 mm format is to be used. The desired photo scale is 1:25000. The end lap & side lap are to be 60% & 30%. Beginning and ending lines are to be positioned along the boundaries of the study area. The only map available for the area is at a scale of 1:62500. This map indicates that the average terrain elevation is 300 m above datum. Perform the computations necessary to develop a flight plan.	CO2
OR	
3. Explain distortion and displacement.	CO2

4. Explain uses of maps.	CO2
OR	
4. Define passive and active remote sensing.	CO2

5. Assume that a vertical photograph was taken at a flying height of 5000 m above sea level using a camera with a 152 mm focal length lens. (a) Determine the photo scale at points A and B, which lie at elevations of 1200 and 1960 m. (b) What ground distance corresponds to a 20.1 mm photo distance measured at each of these elevations?	CO3
OR	
5. A rectangular agricultural field measures 8.65 cm long and 5.13 cm wide on a vertical photograph having a scale of 1:20,000. Find the area of the field at ground level.	CO3

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Marks and Gap Analysis of Mid-Term 1

S.No.	University Roll No.	Name of Student	Mid-Term 1 MM-70	Remark (Remedial Class need or not – Y/N)
1.	21ETCCE001	Dev vaishnav	44	N
2.	21ETCCE002	Hitesh Sutradhar	44	N
3.	21ETCCE004	Naved khan	51	N
4.	21ETCCE006	Pushpendra gehlot	61	N
5.	21ETCCE007	Shalin Dak	44	N
6.	21ETCCE009	Tamanna kumawat	56	N
7.	21ETCCE300	Muniraj Sharma	61	N
8.	22ETCCE200	Moiz Udaipurwala	44	N
9.	22ETCCE201	Vikas Suthar	47	N

*(Y, if obtained marks are <50%)

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Remedial Action Taken to Remove the Gaps (After Mid- Term 1)

S.no.	University Roll no.	Name of Student	Topics to be discussed in Remedial Class	Schedule Date of Remedial Class	Outcome Achieved
1.	NIL				
2.					

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TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR

B. TECH. 3rd – YEAR (VI SEM.) – MT-II

Geographic Information System and Remote Sensing (6CE5-16)

Time: 3 Hours **Max. Marks:** 70

Min. Marks: 25

Note:

1) The paper is divided into 3 parts: Part-A, Part-B and Part-C.
2) Part-A contains 5 questions and carries 2 mark each.
3) Part-B contains 6 questions and carries 7 marks each. Attempt any 4 questions.
4) Part-C contains 3 questions and carries 15 marks each. Attempt any 2 questions.

Part- A (12 Marks)

K.	Differentiate spectral and spatial resolution.
L.	Define the two basic data classifications used in GIS.
M.	Define the wavelength classification of electromagnetic radiation.
N.	Define the types of aerial photographs.
O.	Define photogrammetry.
P.	Define spectral signatures.

Part- B (28 Marks)

1.	What is a stereoscope parallax? Define and explain the parallax equations.
2.	Define any four spatial filtering methods in image processing.
3.	A flight plan for an area 10 miles wide and 15 miles long is required. The average terrain in the area is 1500 feet above datum. The camera has a 6 inch focal length with 9x9 inch format. Consider the endlap and overlap to be 60% and 25% respectively, and the photographic scale to be 1: 12000 (1000 feet/inch).
4.	Explain the differences between monochromatic, multispectral, hyperspectral and ultra-spectral sensors with examples.
5.	Define schematically the principal of a single lens frame aerial camera.
6.	What is relief displacement in a vertical photograph? Derive the relation between relief displacement and the height above datum with an appropriate diagram.

Part- C (30 Marks)

7.	What is tilt distortion? Prove that in a tilted photograph, tilt distortion is radial from isocentre.
8.	Explain in detail what thematic maps are and how they are generated with an example.

9.	Explain the remote sensing system with a schematic diagram.

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Marks and Gap Analysis of Mid-Term II

Sr. No.	University Roll No.	Name of Student	Mid-Term 2 MM-70	Remark (Remedial Class need or not – Y/N)
1.	21ETCCE001	Dev vaishnav	42	N
2.	21ETCCE002	Hitesh Sutradhar	40	N
3.	21ETCCE004	Naved khan	53	N
4.	21ETCCE006	Pushpendra gehlot	60	N
5.	21ETCCE007	Shalin Dak	41	N
6.	21ETCCE009	Tamanna kumawat	52	N
7.	21ETCCE300	Muniraj Sharma	63	N
8.	22ETCCE200	Moiz Udaipurwala	45	N
9.	22ETCCE201	Vikas Suthar	42	N

*(Y, if obtained marks are <50%)

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Remedial Action Taken to Remove the Gaps (After Mid- Term II)

Sr. No.	University Roll no.	Name of Student	Topics to be discussed in Remedial Class	Schedule Date of Remedial Class	Course Outcome
1.	NIL				

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University Question Paper

Roll No. .....

Total Page No. : 2

610311

610311

B.TECH. VI SEM MAIN/BACK EXAM
AUGUST 2023
CIVIL ENGINEERING
(6CE5-16) - GEOGRAPHIC INFORMATION SYSTEM & REMOTE SENSING

Time : 2 Hours]

[Max. Marks : 80

[Min. Passing Marks : 30

Instructions to Candidates : Part – A: Short answer type questions (up to 25 words) 5 × 2 marks = 10 marks. All 5 questions are compulsory.

Part – B: Analytical/Problem Solving questions 4 × 10 marks = 40 marks. Candidates have to answer 4 questions out of 6.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer 2 questions out of 3.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1 : NIL

2 : NIL

PART A

1. Define the types of aerial photographs.
2. Define spectral signatures.
3. Define the wavelength classification of electromagnetic radiation.
4. Differentiate spectral and spatial resolution.
5. Define the two basic data classification used in GIS.

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PART B

1. What is relief displacement in a vertical photograph ? Derive the relation between the relief displacement and the height above datum with an appropriate diagram.
2. Explain the differences between monochromatic, multispectral, hyperspectral and ultraspectral sensors with examples.
3. What is stereoscopic parallax ? Define and explain the parallax equations.
4. Define schematically the principal of a single lens frame aerial camera.
5. A flight plan for an area 10 miles wide and 15 miles long is required. The average terrain in the area is 1500 ft above datum. The camera has a 6 inch focal length with 9 × 9 inch format. Consider the endlap and overlap to be 60% and 25%, respectively, and the photographic scle to be 1 : 12000 (1000 ft/inch).
6. Define any four spatial filtering methods in image processing.

PART C

1. Explain the remote sensing system with a schematic diagram.
2. What is tilt distortion ? Prove that in a tilted photograph, tilt distortion is radial from isocentre.
3. Explain in detail what are thematic maps and how they are generated with an example.

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STUDENT PERFORMANCE REPORT

Roll No.	Name of Student	I Mid-Term	II Mid-Term	Average
21ETCCE001	Dev vaishnav	44	42	43
21ETCCE002	Hitesh Sutradhar	44	40	42
21ETCCE004	Naved khan	51	53	52
21ETCCE006	Pushpendra gehlot	61	60	60.5
21ETCCE007	Shalin Dak	44	41	42.5
21ETCCE009	Tamanna kumawat	56	52	54
21ETCCE300	Muniraj Sharma	61	63	62
22ETCCE200	Moiz Udaipurwala	44	45	44.5
22ETCCE201	Vikas Suthar	47	42	44.5

Signature of Faculty: **Signature of HOD**

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RESULT ANALYSIS

S.NO.	RTU ROLL NUMBER	NAME OF STUDENT	END TERM MARKS	SESSIONAL MARKS	TOTAL
		MAX MARKS	**70**	**30**	**100**
1.	21ETCCE001	Dev vaishnav	Result pending	19	
2.	21ETCCE002	Hitesh Sutradhar		19	
3.	21ETCCE004	Naved khan		22	
4.	21ETCCE006	Pushpendra gehlot		26	
5.	21ETCCE007	Shalin Dak		19	
6.	21ETCCE009	Tamanna kumawat		24	
7.	21ETCCE300	Muniraj Sharma		26	
8.	22ETCCE200	Moiz Udaipurwala		19	
9.	22ETCCE201	Vikas Suthar		20	

TOTAL	PASS	FAIL	ABSENT	PASS %
9				

Indirect Assessment:

Overall Teacher Self-Assessment (at the completion of course) in terms of course objective and outcomes

Course Objectives:

Student will learn basics of RS and GIS from this 28-hour course. They will be able to work on Remote sensing Software and find a continuous and constant source of information about the Earth, and geographic information systems (GIS) are a methodology for handling all this geographic data. They will study the spatial distribution of uncertainty in categorical maps. Nowadays Geographic Information System and Remote Sensing are playing a crucial role in our environmental development, raw materials assessment, urbanization, study of watershed, survey and management of cultivable land, study of forestry, geological structure, disaster management and supervision

Rs and Gis is the basic requirement for the job role of Research Engineer in the companies like Geo Climate Risk Solutions, Geo Infosys etc.

Course Outcomes:

At the end of this course students will be able to:

1. Student will be able to Understand the basic concept of Remote Sensing and know about different types of satellite and sensors.
2. Student will be able to Apply the concepts of Photogrammetric and its applications such as determination of heights of objects on terrain.
3. Students will be able to Express the principles of aerial and satellite remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies.
4. Students will be able Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems
5. Students will be able Develop knowledge on conversion of data from analogue to digital and working with GIS software.

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Methodology to identify bright student

Considered a range of criteria, including academic performance, creativity, critical thinking, problem-solving skills, and enthusiasm for learning. Bright students often excel in multiple areas. Observed how students perform in the classroom. In terms of active participation, engagement in discussions, leadership, and the ability to grasp complex concepts.

Efforts to keep students engaged

1. Active Learning:
   - Incorporate active learning strategies, such as group discussions, problem-solving activities, and hands-on projects. Active participation keeps students engaged and encourages critical thinking.
2. Varied Teaching Methods:
   - Use a variety of teaching methods, including lectures, group work, multimedia presentations, and interactive activities to cater to different learning preferences.
3. Technology Integration:
   - Leverage technology, such as online platforms, educational apps, and interactive software, to make lessons more engaging and interactive.

Methodology to identify weak student

Considered a range of criteria, including classroom observation, formative assessment, summative assessment, assignment review e.t.c. Weak students are struggling students with sensitivity and a desire to support their learning. Some measures, such as additional tutoring, personalized assignments, or alternative assessment methods, to help students succeed.

Targeted inventions for weak student

1. Additional Resources

Offer supplementary learning materials, such as textbooks, online resources, or multimedia content, to provide alternative explanations and reinforce key concepts.

2. Remedial classes

Establish a tutoring program where students can receive extra help from teachers.

3. Flipped classroom

Students are assigned pre-class learning materials, often in the form of videos, readings, or online modules, to cover the foundational concepts before coming to class.