ANNEXURE: 1 MODULE WISE COURSE CONTENT AND OUTCOME

Sl. No	Module Name	Module Content	Module Learning Outcome	Duration (Hrs)
1	Fundamentals of LiDAR Technology	Introduction to LiDAR systems, principles of laser ranging, types of LiDAR (airborne, terrestrial, mobile).	Gain foundational knowledge of LIDAR technology and its use in capturing terrain data.	9hrs
2	LIDAR Data Acquisition	Techniques for operating LIDAR equipment, understanding flight paths, and data collection for large-scale surveys.	Learn to use LIDAR systems for accurate data acquisition in real-world environments.	9hrs
3	Data Processing and 3D Modeling	Processing raw LIDAR data, removing noise, and creating high-resolution 3D terrain models.	Master the techniques for transforming raw LIDAR data into actionable 3D models.	9hrs
4	Integration with Visualization Tools	Importing LIDAR data into 3D modeling tools and Unity engine for advanced visualization and analysis.	Integrate and analyze LIDAR data in 3D modeling tools and Unity environments for enhanced project planning.	9hrs
5	Industry Applications of LIDAR Technology	Case studies and hands-on exercises in using LIDAR for construction, urban planning, disaster	Apply LIDAR data for real-world applications, solving industry-specific	9hrs

		management, and mining.	challenges.	

ANNEXURE : 2 Industry Use Cases/Final Projects

Use Case 1: Generating digital elevation models (DEMs) for flood risk management.

Use Case 2: Extracting terrain features for urban planning in hilly regions.

Use Case 3: Designing a virtual representation of a proposed industrial site.

Use Case 4: Creating immersive terrains for virtual tourism applications.

Use Case 5: Simulating land usage scenarios for environmental impact studies.

Use Case 6: Analyzing the impact of deforestation on water flow patterns.

Use Case 7: Visualizing terrain constraints for new housing developments.

Use Case 8: Identifying vulnerable zones in a coastal city for disaster management..

Use Case 9: Designing optimal routes for highways in mountainous regions.

Use Case 10: Evaluating hill slopes for solar panel placements.

Use Case 11: Creating a desert terrain for an open-world RPG game.

Use Case 12: Simulating mountain rescue training in a VR environment.

Use Case 13: Visualizing a dam construction project with surrounding terrain.

Use Case 14: Mapping ancient settlements hidden under dense forest.

Use Case 15: Predicting erosion risks in agricultural lands near riverbanks.

Use Case 16: Designing evacuation routes for areas prone to landslides.

Use Case 17: Planning drainage systems for a growing suburban area.

Use Case 18: Analyzing terrain slope and elevation for offshore wind farm sites.

Use Case 19: Designing contour farming systems to reduce water runoff in hilly terrains.

Use Case 20: Planning reservoirs and water catchment areas to mitigate water scarcity.

LIST OF INDUSTRY USE CASES (20 PROJECTS THAT COMPREHENSIVELY COVER ALL THE LEARNING OUTCOMES)	
S.NO	**Final Projects**
1	Generating digital elevation models (DEMs) for flood risk management.
2	Extracting terrain features for urban planning in hilly regions.
3	Designing a virtual representation of a proposed industrial site.
4	Creating immersive terrains for virtual tourism applications.
5	Simulating land usage scenarios for environmental impact studies.
6	Analyzing the impact of deforestation on water flow patterns.
7	Visualizing terrain constraints for new housing developments.
8	Identifying vulnerable zones in a coastal city for disaster management..
9	Designing optimal routes for highways in mountainous regions.
10	Evaluating hill slopes for solar panel placements.
11	Creating a desert terrain for an open-world RPG game.
12	Simulating mountain rescue training in a VR environment.
13	Visualizing a dam construction project with surrounding terrain.
14	Mapping ancient settlements hidden under dense forest.
15	Predicting erosion risks in agricultural lands near riverbanks.

16	Designing evacuation routes for areas prone to landslides.
17	Planning drainage systems for a growing suburban area.
18	Analyzing terrain slope and elevation for offshore wind farm sites.
19	Designing contour farming systems to reduce water runoff in hilly terrains.
20	Planning reservoirs and water catchment areas to mitigate water scarcity.

ANNEXURE :3 Assessment Rubrics

COURSE ASSESSMENT RUBRICS (TOTAL MARKS: 70)				
ASSESSME NT CRITERIA	**FAIR (50%-64%)**	**GOOD (65%-79%)**	**EXCELLEN T (80%-100%)**	**WEIGHTA G E (MARKS)**
Demonstrates understanding of LiDAR principles and 3D modeling techniques.	Basic understanding with gaps.	Solid understanding of key concepts.	Comprehensive understanding of LiDAR and 3D modeling.	20
Applies knowledge to process and visualize LiDAR data for 3D modeling.	Limited practical application.	Competent application with minor errors.	Innovative solutions in 3D modeling.	20
Completes project demonstrating application of LiDAR technology to real-world problems.	Basic project with minimal innovation.	Meets project objectives effectively.	Exceeds expectations with innovative implementation.	20
Presents findings and solutions clearly.	Needs improvement in communication.	Clear presentation with minor gaps.	Professional and comprehensive presentation.	10