GMR Institute of Technology
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Department of Civil Engineering

Mapping of Civil Engineering Curriculum and Activities to Sustainable Development Goals (SDGs)

S.No	Subject Code	Course Name	Aligned SDGs	Justification	Activities suggested relevant to SDG
Third Semester					
1	23CE302	Building Materials and Concrete Technology	SDG 9, SDG 11, SDG 12, SDG 13	Building Materials and Concrete Technology aligns with **SDG 9 (Industry, Innovation, and Infrastructure)** by promoting the development of durable, efficient, and innovative construction materials that support resilient infrastructure. It supports **SDG 11 (Sustainable Cities and Communities)** by enabling sustainable urban development through eco-friendly and high-performance concrete. The subject encourages **SDG 12 (Responsible Consumption and Production)** by advocating the use of recycled materials, waste minimization, and sustainable construction practices. It also contributes to **SDG 13 (Climate Action)** by reducing carbon emissions through low-carbon cement alternatives and energy-efficient production technologies.	• Low-Carbon Concrete Mix Design Challenge-SDG9 and SDG13 • Waste-to-Concrete Workshop-SDG 11and SDG 12
2	23CE303	Building Planning and Drawing	SDG 4 , SDG 9, SDG 11, SDG 12	This course enables students to design functional and sustainable buildings, advancing **SDG 4** through practical, skill-based education. It aligns with **SDG 9** by fostering technical drawing skills crucial to infrastructure development. Through	• Sustainable Building Design Project-SDG 4, SDG 9, SDG 11, SDG 12 • Zero-Waste Design Challenge- SDG 4, SDG 9, SDG 11, SDG 12

				thoughtful space planning and energy-efficient design, it supports **SDG 11**. Incorporating sustainable material usage and minimizing design waste reinforces **SDG 12**.	
3	23CE304	Fluid Mechanics	SDG 6, SDG 9, SDG 11, SDG 13	By focusing on water flow and hydraulic systems, this course underpins **SDG 6** for water resource management and sanitation systems. It supports **SDG 9** through its application in hydraulic structures and mechanical innovations. It helps realize **SDG 11** via fluid dynamics in urban water infrastructure. Efficient water system design also aids in climate resilience, aligning with **SDG 13**.	• Hydraulic Structure Model Making- SDG 9, SDG 13 • Rainwater Harvesting System Design- SDG 6, SDG 13 • Urban Water Supply Network Design- SDG 6, SDG 9, SDG 11
4	23CE305	Solid Mechanics I	**SDG 9, SDG 11, SDG 12, SDG 13**	This subject builds foundational knowledge of structural behavior, aiding infrastructure innovation (**SDG 9**). Accurate stress-strain analysis ensures safer and more sustainable structures (**SDG 11**). Material efficiency and structural optimization contribute to responsible use of resources (**SDG 12**). Efficient designs also help in climate impact reduction (**SDG 13**).	• Stress-Strain Curve Laboratory Experiment-SDG 9, SDG 11 • Climate-Resilient Structural Design Project-SDG 11, SDG 13
5	23CE306	Surveying	SDG 6, SDG 9, SDG 11, SDG 13, SDG 15	Surveying supports **SDG 9** by enabling precise planning of infrastructure projects. It aligns with **SDG 6** through applications in water resource mapping and sanitation planning. For **SDG 11**, it provides spatial data crucial for sustainable urban layouts. It contributes to **SDG 13** by assessing terrain for climate-resilient infrastructure. For **SDG 15**, it aids land use planning and conservation.	• Topographic Survey Project-SDG 9, SDG 11 • Water Resource Mapping Exercise- SDG 6, SDG 9 • Land Use and Conservation Survey- SDG 15, SDG 11
6	23CE307	Solid Mechanics Laboratory	SDG 9, SDG 11, SDG 12, SDG 13	This lab provides hands-on experience in testing material strength, supporting **SDG 9** through practical innovation in construction. It reinforces **SDG 11** by ensuring material suitability for safe and sustainable structures. By promoting efficient use of tested materials and minimizing waste, it aligns with **SDG 12**.	• Non-Destructive Testing Workshop- SDG 9, SDG 12, SDG 13 • Comparative Study of Conventional vs. Sustainable Materials- SDG 9, SDG 11, SDG 12, SDG 13

				It also helps reduce structural failures and associated carbon impacts, contributing to **SDG 13**.	
7	23CE308	Surveying Laboratory	SDG 6, SDG 9, SDG 11, SDG 13, SDG 15	Field-based surveying enhances planning accuracy for infrastructure and water systems, aligning with **SDG 6** and **SDG 9**. It contributes to **SDG 11** by supporting sustainable land development. The lab fosters awareness of topography and environmental impact, helping mitigate climate risks (**SDG 13**) and ensuring responsible land use (**SDG 15**).	• GIS-Based Survey Data Integration- SDG 9, SDG 6, SDG 11 • Land Use & Environmental Impact Mapping- SDG 15, SDG 11
Fourth Semester					
1	23CE401	Hydraulics and Hydraulic Machinery	SDG 6, SDG 7, SDG 9, SDG 13	Focuses on water flow, turbines, and pumps, promoting efficient water and energy systems (**SDG 6 & 7**). Supports infrastructure design and innovation (**SDG 9**) and enhances climate resilience through flood control and energy efficiency (**SDG 13**).	• Pipe Flow Analysis- SDG 6, SDG 9 • Flood Control Model Study- SDG 9, SDG 13
2	23CE402	Soil Mechanics	SDG 2, SDG 3, SDG 9, SDG 11, SDG 12, SDG 13, SDG 15	Ensures safe foundation design for agriculture, infrastructure, and settlements, supporting **SDGs 2, 3, 9, and 11**. Efficient soil use promotes sustainability (**SDG 12**), while geotechnical solutions reduce erosion and land degradation (**SDG 13 & 15**).	• Foundation Settlement Analysis- SDG 3, SDG 9, SDG 11 • Sustainable Ground Improvement Study- SDG 9, SDG 12, SDG 13 • Erosion Control & Slope Stability Project- SDG 13, SDG 15 • Bearing Capacity Determination- SDG 2, SDG 9, SDG 11
3	23CE403	Solid Mechanics II	SDG 6, SDG 7, SDG 9, SDG 12	Strength analysis of structures enables innovation and safety (**SDG 9**). Promotes efficient material use (**SDG 12**), and supports infrastructure for energy and water systems (**SDG 6 & 7**).	• Beam Testing for Water Tank Staging- SDG 6, SDG 9 • Vibration Test on Small Beam- SDG 7, SDG 9, SDG 12
4	23CE404	Structural Analysis	SDG 7, SDG 9, SDG 11, SDG 13	Teaches structural integrity assessment for buildings and infrastructure, aligning with **SDG 9**. Supports **SDG 11** through resilient city infrastructure and **SDG 13** by enabling climate-safe structures.	• Crack Pattern Mapping- SDG 9, SDG 11 • Load Carrying Capacity Check of Beams- SDG 7, SDG 11
5	23CE405	Transportation Engineering	SDG 3, SDG 9,	Enhances mobility and safety (**SDG 3**) through sustainable transport networks (**SDG 11**).	• Traffic Volume Count Survey

			SDG 11, SDG 12, SDG 13	Encourages low-emission designs (**SDG 13**) and efficient material use in construction (**SDG 12**), supporting **SDG 9** innovation.	- SDG 3, SDG 11 • Road Safety Audit for a Local Street- SDG 3, SDG 11 • Sustainable Pavement Material Study- SDG 9, SDG 12, SDG 13
6	23CE406	Fluid Mechanics and Hydraulic Machinery Laboratory	SDG 3, SDG 6, SDG 9, SDG 11, SDG 12, SDG13, SDG 14	Lab work builds practical skills for water and energy infrastructure (**SDG 6 & 7**), with implications for health (**SDG 3**) and sustainability (**SDG 9, 11, 12**). Focus on aquatic systems and pollution prevention supports **SDG 13 & 14**.	• Water Quality Testing- SDG 3, SDG 6, SDG 14 • Rainwater Harvesting Model- SDG 6, SDG 11, SDG 12 • Solar Water Heating Prototype- SDG 7, SDG 9, SDG 12
7	23CE407	Soil Mechanics Laboratory	SDG 6 ,SDG 9, SDG 11 ,SDG 12 , SDG 13,SDG 15	The Soil Mechanics Laboratory contributes to sustainable development by enabling students to assess soil properties essential for safe, efficient, and resilient infrastructure (SDG 9, SDG 11). Tests on permeability and moisture content support clean water management and groundwater protection (SDG 6). Compaction and material usage analysis promote responsible resource use (SDG 12), while strength and swell behavior evaluations help design climate-resilient foundations (SDG 13). Overall, these practices ensure sustainable land use and ecosystem conservation (SDG 15).	• Grain Size analysis-SDG 6, SDG 12 and SDG 15 • Unconfined Compressive Strength Test- SDG 9, SDG 11 and SDG 13
Fifth Semester					
1	23CE501	Design and Detailing of RC Structures	SDG 9, SDG 11, SDG 12	Focuses on designing resilient reinforced concrete structures essential for infrastructure development (**SDG 9**) and safe urban housing (**SDG 11**). Encourages efficient use of materials and standardized detailing practices that reduce waste (**SDG 12**).	• Poster Presentation on Sustainable RC Innovations - SDG 9, SDG 12 • Mini-Project: RC Design for a Low-Income Housing Colony - SDG 9, SDG 11, SDG 12
2	23CE502	Environmental Engineering	SDG 3,SDG 6, SDG 11, SDG 13	Addresses pollution control, wastewater treatment, and water quality, promoting public health (**SDG 3**) and clean water (**SDG 6**). Supports sustainable urban environments	• Wastewater Treatment Plant Design Project - SDG 3, SDG 6, SDG 11 • Air Pollution Control Simulation - SDG 3, SDG 13

				(**SDG 11**) and climate protection through emission control (**SDG 13**).	
3	23CE503	Foundation Engineering	SDG 1, SDG 7, SDG 9, SDG 11, SDG 12, SDG 13	Enables safe, cost-effective infrastructure in challenging soils, supporting inclusive development (**SDG 1**) and innovative energy systems (**SDG 7 & 9**). Promotes sustainable construction (**SDG 11 & 12**) and climate resilience through soil stabilization and low-carbon designs (**SDG 13**).	• Pile Load Testing - SDG 9, SDG 11 • Soil Stabilization Field Work - SDG 1, SDG 7, SDG 13 • Low-Cost Foundation Design for Rural Housing - SDG 1, SDG 9, SDG 11 • Climate-Resilient Ground Improvement Plan for Flood-Prone Sites - SDG 9, SDG 11, SDG 13
4	23CE504	Hydrology	SDG 6, SDG 9, SDG 11, SDG 12, SDG 13	Supports water resource management and flood control (**SDG 6 & 13**). Aids infrastructure development (**SDG 9**) and sustainable city planning (**SDG 11**) while promoting responsible water use and planning (**SDG 12**).	• Floodplain Mapping using GIS - SDG 6, SDG 9, SDG 13 • Rainwater Harvesting Plan - SDG 6, SDG 12 • Sustainable Drainage System (SuDS) Model Construction - SDG 6, SDG 9, SDG 11, SDG 12, SDG 13
5	23CE505	Environmental Engineering Laboratory	SDG 3, SDG 6, SDG 9, SDG 12, SDG13, SDG 14	Provides hands-on skills in water and wastewater testing, supporting public health (**SDG 3**) and water sanitation goals (**SDG 6**). Encourages sustainable practices in pollution monitoring (**SDG 12, 13**), with focus on environmental protection of aquatic life (**SDG 14**) and infrastructure innovation (**SDG 9**).	• Water Quality Testing - SDG 3, SDG 6, SDG 14 • Effluent Treatment Performance Evaluation - SDG 9, SDG 12, SDG 13 • Biodegradability Testing of Wastewater - SDG 12, SDG 14
Sixth Semester					
1	23CE602	Design of Steel Structures	SDG 3, SDG 8, SDG 9, SDG 11, SDG 12, SDG 13	Trains students in creating safe and resilient structures, enhancing public safety (**SDG 3**) and supporting economic growth in the construction sector (**SDG 8**). Encourages efficient steel usage and innovative structural solutions (**SDG 9**), supporting sustainable urban infrastructure (**SDG 11**), reducing material waste (**SDG 12**), and promoting energy-efficient construction (**SDG 13**).	• Steel Connection Detailing Workshop - SDG 9, SDG 12 • Material Optimization for Steel Frames - SDG 8, SDG 13 • Fire-Resistant Steel Design Study - SDG 3, SDG 9, SDG 11
2	23CE603	Estimation and costing	SDG 9, SDG 11, SDG 12, SDG 16	Builds capacity for financial planning in infrastructure projects (**SDG 9**) and promotes cost-effective development of urban services (**SDG 11**). Supports responsible budgeting and	• Cost-Benefit Analysis for Sustainable Buildings - SDG 9, SDG 11, SDG 12 • Life-Cycle Costing of Infrastructure

				resource use (**SDG 12**) while reinforcing transparency and accountability in civil works management (**SDG 16**).	Projects - SDG 9, SDG 12, SDG 16
Seventh Semester/Eighth Semester					
Career Path I, II, III, IV and Other Core Electives					
1	23CEC11	Principles of Building Architecture	SDG 3, SDG 4, SDG 7, SDG 9, SDG 10, SDG 12, SDG 13, SDG 15	Promotes healthy living spaces (**SDG 3**) and quality design education (**SDG 4**). Encourages energy-efficient buildings (**SDG 7**) and resilient infrastructure (**SDG 9**). Supports inclusive design (**SDG 10**), sustainable materials (**SDG 12**), climate-responsive architecture (**SDG 13**), and eco-sensitive site planning (**SDG 15**).	• Climate-Responsive Building Model - SDG 3, SDG 7, SDG 13 • Universal Design Workshop - SDG 4, SDG 10, SDG 11 • Eco-Sensitive Site Planning Exercise - SDG 12, SDG 15, SDG 11 • Healthy Living Space Design Challenge - SDG 3, SDG 4, SDG 9, SDG 13
2	23CEC21	Geometric Design and Highway Materials	SDG 3, SDG 9, SDG 11, SDG 12, SDG 13, SDG 15	Improves road safety and user well-being (**SDG 3**), while enabling smart transport infrastructure (**SDG 9 & 11**). Focuses on sustainable materials (**SDG 12**), emission reduction (**SDG 13**), and minimizing ecological damage during highway development (**SDG 15**).	• Eco-Friendly Pavement Material Testing - SDG 9, SDG 12, SDG 15 • Safe Road Geometric Design Challenge - SDG 3, SDG 11 • Highway Drainage Design for Flood Prevention - SDG 13, SDG 11
3	23CEC31	Prefabricated Structures	SDG 8, SDG 9, SDG 11, SDG 12, SDG 13	Supports green construction practices that improve job efficiency and economic growth (**SDG 8**). Encourages industrialized building methods (**SDG 9**), reduces construction waste (**SDG 12**), enhances urban infrastructure (**SDG 11**), and contributes to low-carbon construction (**SDG 13**).	• Prefab Construction Prototype Development - SDG 8, SDG 9, SDG 13 • Waste Minimization Study in Prefab Projects - SDG 12, SDG 9 • Structural Load Testing on Prefab Units - SDG 9, SDG 11
4	23CE004	Construction Techniques	SDG 3, SDG 6, SDG 7, SDG 8, SDG 9, SDG 11, SDG 12, SDG 13, SDG 14	Teaches safe and modern practices for sustainable infrastructure (**SDG 3, 9, 11**). Promotes clean water use (**SDG 6**), energy-efficient methods (**SDG 7**), and decent work opportunities (**SDG 8**). Encourages responsible material use (**SDG 12**), climate mitigation (**SDG 13**), and eco-friendly coastal infrastructure (**SDG 14**).	• Energy-Efficient Construction Method Demonstration - SDG 7, SDG 13 • Coastal Infrastructure Climate-Resilience Study - SDG 14, SDG 13, SDG 11 • Waste Reduction in Construction Sites - 1 SDG 2, SDG 11

					• Safety Training & Simulation Workshop for Construction Sites - SDG 3, SDG 8, SDG 9, SDG 11 • Clean Water Management in Construction Practices Project - SDG 6, SDG 9, SDG 11
5	23CE005	Airport, Railways and Harbour Engineering	SDG 9, SDG 11, SDG 13, SDG 14	Supports development of sustainable and integrated transport systems (**SDG 9 & 11**). Addresses climate-resilient infrastructure (**SDG 13**) and environmental concerns in marine construction (**SDG 14**).	• Sustainable Transport Terminal Design - SDG 9, SDG 11, SDG 14 • Emission Reduction Plan for Transport Hubs - SDG 13, SDG 11
Elective III					
Career Path I, II, III,IV and Other Core Electives					
1	23CEC12	Building Services	SDG 3, SDG 6, SDG 7, SDG 9, SDG 11, SDG 12, SDG 13,	Covers essential systems like water supply, sanitation, HVAC, and lighting that enhance health (**SDG 3**), clean water (**SDG 6**), and energy efficiency (**SDG 7**). Supports sustainable buildings (**SDG 11**), resource-efficient designs (**SDG 12**), and emissions reduction (**SDG 13**), while advancing smart infrastructure (**SDG 9**).	• HVAC Energy Optimization Project - SDG 7, SDG 12 • Greywater Recycling System Design - SDG 6, SDG 11 • Lighting Design for Energy Efficiency - SDG 7, SDG 12, SDG 11 • Design and Installation of an Energy-Efficient HVAC System Prototype - SDG 3, SDG 7, SDG 9, SDG 11, SDG 13
2	23CEC22	Highway Design and Simulation	SDG 6, SDG 9, SDG 11, SDG 12, SDG 13	Promotes accurate planning and eco-friendly design of road networks (**SDG 9, 11**), considering water runoff and drainage (**SDG 6**). Emphasizes efficient use of materials and land (**SDG 12**), and contributes to emission reduction and climate resilience (**SDG 13**).	• Drainage-Friendly Highway Simulation - SDG 6, SDG 9, SDG 13 • Emission Reduction in Highway Design - SDG 13, SDG 11 • Material Use Optimization in Pavement Layers - SDG 12, SDG 9
3	23CEC32	Pre Engineered Buildings	SDG 7, SDG 9,	Encourages energy-efficient prefabricated construction (**SDG 7**) and industrial	• Modular Construction Energy Analysis - SDG 7, SDG 9

4	23CE007	Engineering Geology	SDG 6, SDG 9,SDG 11, SDG 12, SDG 13,SDG 15	The **Engineering Geology** subject supports sustainable development by enabling students to understand earth processes, geological structures, and subsurface conditions critical for safe and resilient infrastructure (SDG 9, SDG 11). It aids in the responsible selection and use of natural materials (SDG 12) and contributes to disaster risk reduction from earthquakes, landslides, and erosion (SDG 13, SDG 15). Geological studies also guide sustainable water resource development and	• Slope Stability Risk Assessment using GIS - SDG 13, SDG 15 • Landslide Hazard Zonation - SDG 13, SDG 15, SDG 11 • Geological Mapping for Water Resource Planning - SDG 6, SDG 11
5	23CE008	Irrigation and Water Resources Engineering	SDG 2, SDG 6, SDG 9, SDG 11, SDG 12, SDG 13, SDG 15	This subject promotes efficient water use in agriculture, directly supporting **SDG 2 (Zero Hunger)** and **SDG 6 (Clean Water and Sanitation)**. It fosters infrastructure planning for irrigation and flood control, aligning with **SDG 9 (Industry, Innovation, and Infrastructure)** and **SDG 11 (Sustainable Cities and Communities)**. Sustainable water management and reduced resource waste contribute to **SDG 12**, while climate-resilient systems align with **SDG 13 (Climate Action)**. It also supports **SDG 15 (Life on Land)** by preventing land degradation and promoting ecosystem balance.	• Irrigation Water Use Efficiency Study - SDG 2, SDG 6, SDG 12 • Canal Lining Design for Water Loss Prevention - SDG 6, SDG 9 • Watershed Management Plan - SDG 6, SDG 13, SDG 15 • Canal Lining and Water Loss Prevention Project – SDG 6, SDG 9, SDG 11, SDG 12
Elective V					
Career Path I, II, III,IV and Other Core Electives					
1	23CEC13	Building Information Modeling	SDG 9, SDG 11, SDG 12, SDG 13	Enhances construction planning and design accuracy using digital technologies (**SDG 9**). Supports smart city development and efficient infrastructure (**SDG 11**), reduces material waste (**SDG 12**), and integrates climate-sensitive modeling (**SDG 13**).	• BIM-Based Sustainable Design Project - SDG 9, SDG 11, SDG 13 • Clash Detection & Waste Minimization Study - SDG 12, SDG 9
2	23CEC23	Highway Project Formulation and Economics	SDG 8, SDG 9, SDG 11, SDG 13	Focuses on planning and economic evaluation of transportation projects that boost employment (**SDG 8**), support resilient infrastructure (**SDG 9**), and enable inclusive urban mobility (**SDG 11**). Promotes	• Lifecycle Cost Analysis for Sustainable Roads - SDG 8, SDG 9, SDG 13 • Socio-Economic Impact Study of Highway Projects - SDG 8, SDG 11

				sustainable, climate-adaptive transport systems (**SDG 13**).	
3	23CE010	Ground Improvement Techniques	SDG 6, SDG 9, SDG 11, SDG 12, SDG 13, SDG 15	Enhances subsoil conditions to support infrastructure in challenging environments (**SDG 9, 11**). Promotes sustainable land development (**SDG 15**) and ensures responsible use of natural materials (**SDG 12**). Improves water retention and drainage (**SDG 6**), while reducing failure risks under changing climate (**SDG 13**).	• Soil Drainage & Retention Improvement Field Work - SDG 6, SDG 11, SDG 15 • Geotextile Application Demonstration - SDG 9, SDG 12 • Ground Densification Experiment - SDG 9, SDG 13
4	23CE011	Advanced Reinforced Concrete Design	SDG 6, SDG 9, SDG 10,SDG 11, SDG 12, SDG 13, SDG 15	Facilitates the design of inclusive and disaster-resilient infrastructure (**SDG 10, 11**), integrating efficient use of water and construction resources (**SDG 6 & 12**). Promotes advanced structural safety for infrastructure (**SDG 9**) and long-term resilience to environmental impacts (**SDG 13 & 15**).	• Inclusive RC Design for Disaster-Prone Areas - SDG 6, SDG 10, SDG 13 • Water-Efficient Construction Detailing - SDG 6, SDG 12, SDG 15 • Long-Span RC Structure Load Testing - SDG 9, SDG 11
5	23CE012	Construction Methods and Equipment	SDG 9, SDG 11 , SDG 12, SDG 13	Provides knowledge on efficient technologies and sustainable equipment for construction (**SDG 9**). Encourages sustainable building practices and project execution (**SDG 11**), minimizes resource use and operational waste (**SDG 12**), and supports emissions reduction (**SDG 13**).	• Equipment Energy Efficiency Benchmarking - SDG 9, SDG 12, SDG 13 • Modern Formwork System Demonstration - SDG 9, SDG 11 • Waste Management Plan for Construction Sites - SDG 12, SDG 11
Elective VI					
1	23CE013	Basics of Dynamics and Earthquake Engineering	SDG 3, SDG 9, SDG 11, SDG 13	Enhances understanding of earthquake-resistant design, improving public safety (**SDG 3**) and infrastructure reliability (**SDG 9**). Supports the development of resilient urban buildings (**SDG 11**) and reduces disaster risks aggravated by climate change (**SDG 13**).	• Shake Table Seismic Simulation - SDG 3, SDG 9, SDG 11 • Retrofitting Strategies for Earthquake-Prone Zones - SDG 3, SDG 13
2	23CE014	Pavement Analysis and Design	SDG 9, SDG 11, SDG 12, SDG 13	Enables design of long-lasting pavements using sustainable materials (**SDG 12**) and innovative practices (**SDG 9**). Supports efficient transportation infrastructure (**SDG 11**) and integrates design features that reduce carbon footprint (**SDG 13**).	• Sustainable Pavement Mix Design - SDG 9, SDG 12, SDG 13 • Pavement Load-Bearing Capacity Testing - SDG 9, SDG 11
3	23CE015	Prestressed	SDG 3,	Covers the design of advanced structural	• Prestressing Technique

		Concrete Structures	SDG 9, SDG 11	systems with enhanced load-bearing and durability features (**SDG 9**). Supports safe and efficient construction of large-scale infrastructure (**SDG 11**) and indirectly contributes to safety in the built environment (**SDG 3**).	Demonstration - SDG 3, SDG 9 • Long-Span Girder Design & Testing - SDG 9, SDG 11
Elective VIII					
1	23CE016	Repair and Rehabilitation of Structures	SDG 9, SDG 11, SDG 13, SDG 17	Focuses on extending the life of existing infrastructure, supporting sustainable development (**SDG 9 & 11**). Promotes low-carbon solutions through reuse and retrofitting (**SDG 13**) and encourages collaboration among stakeholders for sustainable practices (**SDG 17**).	• Retrofitting & Strengthening Workshop - SDG 9, SDG 11, SDG 13 • Low-Carbon Material Use in Repairs - SDG 12, SDG 13 • Stakeholder Engagement Seminar on Sustainable Infrastructure Practices - SDG 11, SDG 17
2	23CE017	Remote Sensing and GIS	SDG 2, SDG 6, SDG 11, SDG 13, SDG 15	Enables spatial analysis for agriculture (**SDG 2**), water management (**SDG 6**), and urban planning (**SDG 11**). Supports disaster preparedness and climate monitoring (**SDG 13**) and aids in land use and forest management (**SDG 15**).	• Land Use Change Detection using RS & GIS - SDG 2, SDG 11, SDG 15 • Flood Risk Mapping - SDG 6, SDG 13
3	23CE018	Pavement Management System	SDG 9, SDG 11, SDG 12, SDG 13	Facilitates efficient planning, maintenance, and rehabilitation of road networks (**SDG 9 & 11**). Encourages optimal resource use in pavement lifecycle (**SDG 12**) and promotes climate-resilient infrastructure through predictive maintenance (**SDG 13**).	• Predictive Pavement Maintenance Planning - SDG 9, SDG 11, SDG 13 • Carbon Footprint Reduction Plan for Road Maintenance - SDG 12, SDG 13