LESSON PLAN OF 5th SEMESTER CIVIL ENGINEERING

DISCIPLINE :-CIVIL ENGG.	SEMESTER:-5th	NAME OF THE TEACHING FACULTY:- **JYOTIRMAYEE SABAR, SENIOR LECTURER**
SUBJECT:- RAILWAY & BRIDGE ENGINEERING TH-3	No of Days/per Week Class Allotted :- 04	SEMESTER FROM:- **14.07.2025 TO 15.11.2025** **WINTER 2025** NO OF WEEKS:- **15**

Week	Class Day	Theory Topics
1st	1st	**Introduction** Railway terminology Advantages of railways
	2nd	Classification of Indian Railways
	3rd	**Permanent way** Definition and components of a permanent way
	4th	Definition and components of a permanent way
2nd	1st	Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	2nd	Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	3rd	Concept of gauge, different gauges prevalent in India, suitability of these gauges under different conditions
	4th	**Track materials** Rails , Functions and requirement of rails
3rd	1st	Types of rail sections, length of rails Rail joints – types, requirement of an ideal joint
	2nd	Purpose of welding of rails & its advantages
	3rd	Creep- definition, cause & prevention
	4th	Sleepers Definition, function & requirements of sleepers
4th	1st	Classification of sleepers
	2nd	Advantages & disadvantages of different types of sleepers
	3rd	Ballast Functions & requirements of ballast
	4th	Materials for ballast Fixtures for Broad gauge
5th	1st	Connection of rails to rail-fishplate, fish bolts Connection of rails to sleepers
	2nd	**Geometric for broad gauge** Typical cross – sections of single & double broad gauge railway track in cutting and embankment
	3rd	Typical cross – sections of single & double broad gauge railway track in cutting and embankment
	4th	Permanent & temporary land width
6th	1st	Gradients for drainage
	2nd	Gradients for drainage
	3rd	Gradients for drainage
	4th	Super elevation – necessity & limiting valued
7th	1st	Super elevation – necessity & limiting valued
	2nd	Super elevation – necessity & limiting valued
	3rd	Super elevation – necessity & limiting valued
	4th	**Points and crossings**

		Definition, necessity of Points and crossings
8th	1st	Definition, necessity of Points and crossings
	2nd	Types of points & crossings with tie diagrams
	3rd	Types of points & crossings with tie diagrams
	4th	**Laying & maintenance of track** Methods of Laying & maintenance of track
9th	1st	Methods of Laying & maintenance of track
	2nd	Duties of a permanent way inspector
	3rd	Duties of a permanent way inspector
	4th	**Introduction to bridges** Definitions Components of a bridge
10th	1st	Classification of bridges Requirements of an ideal bridge
	2nd	**Bridge site investigation, hydrology & planning** Selection of bridge site, Alignment,
	3rd	Determination of Flood Discharge
	4th	Determination of Flood Discharge
11th	1st	Waterway & economic span
	2nd	Afflux, clearance & free board
	3rd	**Bridge foundation** Scour depth minimum depth of foundation
	4th	Scour depth minimum depth of foundation
12th	1st	Types of bridge foundations – spread foundation, pile foundation- well foundation – sinking of wells, caission foundation
	2nd	Types of bridge foundations – spread foundation, pile foundation- well foundation – sinking of wells, caission foundation
	3rd	Types of bridge foundations – spread foundation, pile foundation- well foundation – sinking of wells, caission foundation
	4th	Types of bridge foundations – spread foundation, pile foundation- well foundation – sinking of wells, caission foundation
13th	1st	Coffer dams
	2nd	Coffer dams
	3rd	Coffer dams
	4th	**Bridge substructure and approaches** Types of piers
14th	1st	Types of abutments
	2nd	Types of wing walls
	3rd	Approaches
	4th	**Culvert & Cause ways** Types of culvers – brief description
15th	1st	Types of culvers – brief description
	2nd	Types of causeways – brief description
	3rd	Types of causeways – brief description
	4th	**REVISION, PREVIOUS YEAR QUESTION ANSWER DISCUSSION**

Signature of Faculty

Signature of HOD

LESSON PLAN OF 5th SEMESTER CIVIL ENGINEERING

DISCIPLINE :-CIVIL ENGG.	SEMESTER:-5th	NAME OF THE TEACHING FACULTY:- **JYOTIRMAYEE SABAR, SENIOR LECTURER**
SUBJECT:- ESTIMATION & COST EVALUATION – II TH-5	No of Days/per Week Class Allotted :- 04	SEMESTER FROM:- **14.07.2025 TO 15.11.2025 WINTER 2025** NO OF WEEKS:- **15**

Week	Class Day	Theory Topics
1st	1st	**Detailed estimate of culverts and bridges** Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.
	2nd	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.
	3rd	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.
	4th	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.
2nd	1st	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.
	2nd	Detailed estimate of a RCC slab culvert with right angled wing walls with bar bending schedule.
	3rd	RCC Hume pipe culvert with splayed angled wing wall
	4th	RCC Hume pipe culvert with splayed angled wing wall
3rd	1st	RCC Hume pipe culvert with splayed angled wing wall
	2nd	RCC Hume pipe culvert with splayed angled wing wall
	3rd	RCC Hume pipe culvert with splayed angled wing wall
	4th	RCC Hume pipe culvert with splayed angled wing wall
4th	1st	**Estimate of irrigation structures** Detailed estimate of simple type of vertical fall to given specification
	2nd	Detailed estimate of simple type of vertical fall to given specification
	3rd	Detailed estimate of simple type of vertical fall to given specification
	4th	Detailed estimate of simple type of vertical fall to given specification
5th	1st	Detailed estimate of simple type of vertical fall to given specification
	2nd	Detailed estimate of simple type of vertical fall to given specification
	3rd	Detailed estimate of simple type of vertical fall to given specification
	4th	Detailed estimate of drainage siphon to given specification.
6th	1st	Detailed estimate of drainage siphon to given specification.
	2nd	Detailed estimate of drainage siphon to given specification.
	3rd	Detailed estimate of drainage siphon to given specification.
	4th	Detailed estimate of drainage siphon to given specification.
7th	1st	Detailed estimate of drainage siphon to given specification.
	2nd	Detailed estimate of drainage siphon to given specification.
	3rd	**Detailed estimate of roads** Detail estimate of a water bound macadam road
	4th	Detail estimate of a water bound macadam road
8th	1st	Detail estimate of a water bound macadam road
	2nd	Detail estimate of a water bound macadam road
	3rd	Detailed estimate of a flexible pavement in cutting / filling
	4th	Detailed estimate of a flexible pavement in cutting / filling

9th	1st	Detailed estimate of a flexible pavement in cutting / filling
	2nd	Detailed estimate of a flexible pavement in cutting / filling
	3rd	Detailed estimate of septic tank and soak pit for 50 users
	4th	Detailed estimate of septic tank and soak pit for 50 users
10th	1st	Detailed estimate of septic tank and soak pit for 50 users
	2nd	Detailed estimate of septic tank and soak pit for 50 users
	3rd	**Miscellaneous estimates** Tube well
	4th	Tube well
11th	1st	Tube well
	2nd	Piles and Pile cap
	3rd	Piles and Pile cap
	4th	Piles and Pile cap
12th	1st	Isolated and combined footings
	2nd	Isolated and combined footings
	3rd	Isolated and combined footings
	4th	**PWD Accounts works** Works Classification of work-original, major, petty, repair work, annual repair, special repair, quadrantal repair.
13th	1st	Concept of Method of execution of works through the contractors and department, contract and agreement, work order, types of contract, piece work agreement.
	2nd	Concept of Method of execution of works through the contractors and department, contract and agreement, work order, types of contract, piece work agreement.
	3rd	Accounts of works – Explanation of various terms Administrative approval, technical sanction, tender, preparation of notice inviting tender, quotations, earnest money, E-tendering, security deposit, advance payment, intermediate payment, final payment, running bill, final bill,
	4th	regular and temporary establishment, cash, major & subhead of account, temporary advance (imprest money),supervision charges, suspense account, debit, credit, book transfer, voucher and related accounts .
14th	1st	Measurement book use & maintenance, procedure of marking entries of measurement of work and supply of materials, labour employed, standard measurement books and common irregularity
	2nd	Muster roll : Its preparation & use for making payment of pay & wages
	3rd	Acquittance Roll : Its preparation & use for making payment of pay & wages
	4th	Labour & labour report, method of labour payment, use of forms and necessity of Submission
15th	1st	Classification of stores, receipt / issue statement on standard form, method of preparation of stock account, preparation and submission of returns, verification of stocks, shortage and excess
	2nd	Building BYLAWS and REGULATORY Bodies, Development authorities, types and their levels, RERA etc.
	3rd	Building BYLAWS and REGULATORY Bodies, Development authorities, types and their levels, RERA etc.
	4th	**REVISION, PREVIOUS YEAR QUESTION ANSWER DISCUSSION**

Signature of Faculty

Signature of HOD

LESSON PLAN OF 5TH SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester:- 5TH	Name of the Teaching Faculty:- **Mr.SWAYAN RANJAN MISRA**
Subject:- **Structural Design-2**	No of Days/per Week Class Allotted :- 04	Semester From:- **14 JUL 2025 TO 15 NOV 2025 (WINTER 2025)** No of Weeks:- **15**

Week	Class Day	Theory Topics
1st	1st	**Introduction** Common steel structures, Advantages & disadvantages of steel structures
	2nd	Types of steel, properties of structural steel.
	3rd	Rolled steel sections, special considerations in steel design.
	4th	Structural analysis and design philosophy.
2nd	1st	Loads and load combinations, Brief review of Principles of Limit State design.
	2nd	**Structural Steel Fasteners and Connections** Bolted Connections Classification of bolts, advantages and disadvantages of bolted connections
	3rd	Different terminology, spacing and edge distance of bolt holes.
	4th	Types of bolted connections. Types of action of fasteners, assumptions and principles of design.
3rd	1st	Strength of plates in a joint, strength of bearing type bolts (shear capacity& Bearing capacity), reduction factors, and shear capacity of HSFG bolts with example problem.
	2nd	Analysis & design of Joints using bearing type and HSFG bolts
	3rd	Efficiency of a joint
	4th	Welded Connections: Advantages and Disadvantages of welded connection
4th	1st	Types of welded joints and specifications for welding
	2nd	Design stresses in welds.
	3rd	Strength of welded joints.
	4th	Numerical problem on welded connection
5th	1st	**Design of Steel tension Members** Common shapes of tension members
	2nd	Common shapes of tension members
	3rd	Analysis and Design of tension members
	4th	Gross Strength of Tension Member
6th	1st	Net Strength of Tension Member
	2nd	Block Shear Strength of Tension Member
	3rd	Numerical Problem on Tension Member
	4th	Numerical Problem on Tension Member
7th	1st	Numerical Problem on Tension Member
	2nd	Lug angle
	3rd	**Design of Steel Compression members** Common shapes of compression members.
	4th	Buckling class of cross sections
8th	1st	slenderness ratio
	2nd	Design compressive stress and strength of compression members.

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	3rd	Design compressive stress and strength of compression members.
	4th	Analysis and Design of compression members
9th	1st	Analysis and Design of compression members
	2nd	Numerical problem solving
	3rd	Numerical problem solving
	4th	Numerical problem solving
10th	1st	**Design of Steel beams:** Common cross sections and their classification.
	2nd	Common cross sections and their classification.
	3rd	Deflection limits According To IS-800
	4th	web buckling and web crippling.
11th	1st	Design of laterally supported beams against bending and shear.
	2nd	Design of laterally supported beams against bending and shear.
	3rd	Design of laterally supported beams against bending and shear.
	4th	Numerical Problem solving
12th	1st	Numerical Problem solving
	2nd	Numerical Problem solving
	3rd	**Design of Tubular Steel Structures:** Round Tubular Section
	4th	Permissible Stresses
13th	1st	Tubular Compression & Tension Members
	2nd	Joints in Tubular trusses
	3rd	Numerical Problem
	4th	Numerical Problem
14th	1st	**Design of Masonry Structures:** Design considerations for Masonry walls & Columns
	2nd	Design considerations for Masonry walls & Columns
	3rd	Load Bearing & Non-Load Bearing walls
	4th	Permissible stresses, Slenderness Ratio
15th	1st	Effective Length, Height & Thickness.
	2nd	Numerical Problem
	3rd	Numerical Problem
	4th	Numerical Problem

11/07/25

Signature of the concerned Lecturer

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LESSON PLAN OF 5th SEMESTER CIVIL ENGINEERING

Discipline :- CIVIL	Semester:- 5th	Name of the Teaching Faculty:- **ASHOK KUMAR RANA**
Subject:- **WATER SUPPLY AND WASTE WASTER ENGINEERING**	No of Days/per Week Class Allotted :- 05	Semester From:- 14th July, 2025 To:- 15th Nov, 2025 (WINTER 2025) No of Weeks:- **16**

Week	Class Day	Theory Topics
1st	1st	**Introduction to Water Supply, Quantity and Quality of water** 1.1 Necessity of treated water supply
	2nd	1.2 Per capita demand,
	3rd	variation in demand and factors affecting demand
	4th	1.3 Methods of forecasting population
	5th	Numerical problems using different methods
2nd	1st	1.4 Impurities in water – organic and inorganic
	2nd	Harmful effects of impurities
	3rd	1.5 Analysis of water –physical
	4th	chemical and bacteriological analysis
	5th	1.6 Water quality standards for different uses
3rd	1st	**Sources and Conveyance of water** 2.1 Surface sources – Lake, stream, river and impounded reservoir
	2nd	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	3rd	2.3 Yield from well- method s of determination, Numerical problems using yield formulae
	4th	2.4 Intakes – types, description of river intake, reservoir intake, canal intake
	5th	2.5 Pumps for conveyance & distribution – types, selection, installation.
4th	1st	2.6 Pipe materials – necessity, suitability, merits & demerits of each type
	2nd	2.7 Pipe joints – necessity, types of joints, suitability
	3rd	methods of jointing Laying of pipes
	4th	**Treatment of water** 3.1 Flow diagram of conventional water treatment system
	5th	3.2 Treatment process 3.2.1 Aeration ; Necessity
5th	1st	3.2.2 Plain Sedimentation : Necessity, working principles
	2nd	Sedimentation tanks – types, essential features, operation & maintenance
	3rd	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation
	4th	types of coagulants, Flash Mixer, Flocculator, Clarifier
	5th	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter
6th	1st	Pressure Filter – essential features .
	2nd	3.2.5 Disinfection : Necessity, methods of disinfection.
	3rd	Chlorination – free and combined chlorine demand, available chlorine, residual chlorine
	4th	pre-chlorination, break point chlorination, super- chlorination
	5th	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method
7th	1st	**Distribution system And Appurtenance in distribution system** 4.1 General requirements, types of distribution system

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	2nd	distribution system-gravity, direct and combined
	3rd	4.2 Methods of supply – intermittent and continuous
	4th	4.3 Distribution system layout – types
	5th	4.3 Distribution system layout – types,comparison, suitability
8th	1st	4.4 Valves-types, features, uses, purpose-sluice valves
	2nd	check valves, air valves, scour valves
	3rd	Fire hydrants, Water meters
	4th	**W/s plumbing in building** 5.1 Method of connection from water mains to building supply
	5th	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building
9th	1st	**Introduction to Waste Water Engineering** 6.1 Aims and objectives of sanitary engineering
	2nd	6.2 Definition of terms related to sanitary engineering
	3rd	6.3 Systems of collection of wastes
	4th	Conservancy and Water Carriage System
	5th	Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability
10th	1st	**Quantity and Quality of sewage** 7.1 Quantity of sanitary sewage – domestic & industrial sewage
	2nd	variation in sewage flow, numerical problem on computation quantity of sanitary sewage
	3rd	7.2 Computation of size of sewer, application of Chazy's formula
	4th	Limiting velocities of flow : self-cleaning and scouring
	5th	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological
11th	1st	7.4 Concept of sewage-sampling, tests for – solids, pH
	2nd	dissolved oxygen, BOD, COD
	3rd	**Sewerage system** 8.1 Types of system-separate, combined
	4th	partially separate , features, comparison between the types, suitability
	5th	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
12th	1st	8.3 Laying of sewer
	2nd	setting out sewer alignment
	3rd	**Sewer appurtenances and Sewage Disposal** 9.1 Manholes and Lamp holes
	4th	Manholes and Lamp holes – types, features, location, function
	5th	9.2 Inlets, Grease & oil trap – features, location, function
13th	1st	9.3 Storm regulator, inverted siphon – features, location, function
	2nd	9.4 Disposal on land – sewage farming, sewage application and dosing
	3rd	sewage sickness-causes and remedies
	4th	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
	5th	**Sewage treatment** 10.1 Principles of treatment
14th	1st	flow diagram of conventional treatment
	2nd	10.2 Primary treatment – necessity, principles, essential features, functions
	3rd	10.2 Primary treatment – necessity, principles, essential features, functions
	4th	10.2 Primary treatment – necessity, principles, essential features, functions
	5th	10.3 Secondary treatment – necessity, principles, essential features, functions
15th	1st	10.3 Secondary treatment – necessity, principles, essential features, functions
	2nd	10.3 Secondary treatment – necessity, principles, essential features, functions

	3rd	**Sanitary plumbing for building** 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	4th	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	5th	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti syphonage pipe .
16th	1st	**DOUBT CLEARING CLASS AND REVISION & PREVIOUS FIVE YEARS QUESTION ANSWER DISCUSSION**
	2nd	
	3rd	
	4th	
	5th	

11.07.2025

Signature of Lecturer

11/7/25

Signature of H.O.D

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Lesson Plan of EMST (Entrepreneurship Management Smart Technology)
(60 Periods)
Semester & Branch : 5th Sem Civil Engg. (2025 winter)

Name of the Teaching Faculty: Ashish Kumar Singh Babu

Semester from Date: 14/7/2025
To Date: 15/11/2025
No.of Weeks: 15 Weeks
No. of Days per Week: 4 Class Allotted

Chapters	Periods	Week	Class Day	Topics to be covered
Chapter-1 (ENTREPRENEURSHIP) (10 Periods)	1	1st	1	•Concept /Meaning of Entrepreneurship •Need of Entrepreneurship
	2		2	•Characteristics, Qualities and Types of entrepreneur, Functions
	3		3	•Barriers in entrepreneurship •Entrepreneurs vrs. Manager
	4		4	•Forms of Business Ownership: Sole proprietorship, partnership forms and others
	5	2nd	1	•Types of Industries, Concept of Start-ups
	6		2	•Entrepreneurial support agencies at National, State, District Level(Sources): DIC,
	7		3	•NSIC,OSIC, KVIC etc.
	8		4	•SIDBI, NABARD, Commercial Banks,
	9	3rd	1	•Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks
	10		2	•Technology Business Incubators (TBI) and Science and Technology Entrepreneur Parks
Chapter-2 (MARKET SURVEY & OPPORTUNITY IDENTIFICATION (BUSINESS PLANNING)) (8 Periods)	11		3	•Introduction to Business Planning
	12		4	•SSI, Ancillary Units, Tiny Units, Service sector Units
	13	4th	1	•Time schedule Plan, Agencies to be contacted for Project Implementation
	14		2	•Time schedule Plan, Agencies to be contacted for Project Implementation
	15		3	•Assessment of Demand and supply and Potential areas of Growth
	16		4	•Assessment of Demand and supply and Potential areas of Growth
	17	5th	1	•Identifying Business Opportunity •Final Product selection
	18		2	•Identifying Business Opportunity •Final Product selection
Chapter-3 (PROJECT REPORT PREPARATION) (4 Periods)	19		3	•Preliminary project report
	20		4	•Detailed project report, Techno economic Feasibility
	21	6th	1	•Detailed project report, Techno economic Feasibility
	22		2	•Project Viability
	23		3	•Definitions of management

Chapter-4 (MANAGEMENT PRINCIPLES) (5 Periods)	24		4	•Principles of management
	25	7th	1	•Functions of management (planning, organising, staffing, directing and controlling etc.)
	26		2	•Functions of management (planning, organising, staffing, directing and controlling etc.)
	27		3	•Level of Management in an Organisation
Chapter-5 (FUNCTIONAL AREAS OF MANAGEMENT) (10 Periods)	28		4	•a) Production management •Functions, Activities •Productivity
	29	8th	1	•Quality control •Production Planning and control
	30		2	•b) Inventory Management •Need for Inventory management •Models/Techniques of Inventory management
	31		3	•c) Financial Management •Functions of Financial management •Management of Working capital
	32		4	•Costing (only concept) •Break even Analysis
	33	9th	1	•Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book,P&L Accounts, Balance Sheets(only Concepts)
	34		2	•d) Marketing Management •Concept of Marketing and Marketing Management •Marketing Techniques (only concepts) Concept of 4P s (Price, Place, Product, Promotion)
	35		3	•e) Human Resource Management •Functions of Personnel Management
	36		4	•Manpower Planning, Recruitment, Sources of manpower, Selection process,
	37	10th	1	•Method of Testing, Methods of Training & Development, Payment of Wages
Chapter-6 (LEADERSHIP & MOTIVATION) (6 Periods)	38		2	•a) Leadership •Definition and Need/Importance •Qualities and functions of a leader
	39		3	•Manager Vs Leader •Style of Leadership (Autocratic, Democratic, Participative)
	40		4	•b) Motivation •Definition and characteristics
	41	11th	1	•Importance of motivation •Factors affecting motivation
	42		2	•Theories of motivation (Maslow) •Methods of Improving Motivation

	43		3	•Importance of Communication in Business •Types and Barriers of Communication
Chapter-7 (WORK CULTURE TQM & SAFETY) (5 Periods)	44		4	•Human relationship and Performance in Organization
	45	12th	1	•Relations with Peers, Superiors and Subordinates
	46		2	•TQM concepts: Quality Policy, Quality Management, Quality system
	47		3	•Accidents and Safety, Cause, preventive measures,
	48		4	•General Safety Rules, Personal Protection Equipment(PPE)
Chapter-8 (LEGISLATION) (6 Periods)	49	13th	1	•Intellectual Property Rights(IPR), Patents,
	50		2	•Intellectual Property Rights(IPR), Patents,
	51		3	•Trademarks, Copyrights
	52		4	•Trademarks, Copyrights
	53	14th	1	•Features of Factories Act 1948 with Amendment (only salient points)
	54		2	•Features of Payment of Wages Act 1936 (only salient points)
Chapter-9 (SMART TECHNOLOGY) (6 Periods)	55		3	•Concept of IOT, How IOT works
	56		4	•Components of IOT, Characteristics of IOT,
	57	15th	1	•Categories of IOT •Applications of IOT- Smart Cities, Smart Transportation,
	58		2	•Smart Industry, Smart Agriculture,
	59		3	•Smart Home, Smart Healthcare,
	60		4	•Smart Energy Management etc.

Sign of Faculty 09/09/25

Sign of HOD 09/09/25