

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
SCHEME OF TEACHING AND EXAMINATION-2024-25
Post Graduate Diploma in Vertical Transportation (PGDVT)

I SEMESTER												
Sl. No	Course	Course Code	Course Title	Teaching Hours per Week				Examination				Credits
				Theory	Tutorial	Practical/ Seminar	Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P	SDA					
1	ESC	PGDVT101	Basics of Electrical and Electronics for VT	03	00	02	00	--	100	--	100	04
2	ESC	PGDVT102	Basic Measurement and Metrology for VT	02	00	02	00	--	100	--	100	03
3	PCC	PGDVT103	Structure of Elevator	03	00	02	00	03	50	50	100	04
4	PCC	PGDVT104	Safety in Vertical Transportation	04	00	00	00	03	50	50	100	04
5	PCC	PGDVT105	Escalators and Moving Walkaways	03	00	00	00	03	100	--	100	03
6	ESCL	PGDVTL106	Basic Computer Lab	00	02	02	00	--	100	--	100	02
TOTAL				15	02	08	00	09	450	250	600	20

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II SEMESTER												
Sl. No	Course	Course Code	Course Title	Teaching Hours per Week				Examination				Credits
				Theory	Tutorial	Practical/ Seminar	Skill Development Activities	Duration in hours	CIE Marks	SEE Marks	Total Marks	
				L	T	P	SDA					
1	PCC	PGDVT201	Installation of Elevator	02	00	02	00		100	--	100	03
2	PCC	PGDVT202	Site Surveying and Installation	02	00	02	02		100	--	100	04
3	PCC	PGDVT203	Post-Installation Testing and Commissioning and Report Writing	01	00	04	00		100	--	100	03
4	PCCL	PGDVTL204	Practical Installation Lab	00	00	04	02	03	100	100	200	02
5	PCC	PGDVT205	Project Work - I / Internship					03	100	100	200	08
TOTAL				03	02	12	06	06	500	200	700	20

BASICS OF ELECTRICAL AND ELECTRONICS FOR VT			
Course Code	PGDVT101	CIE Marks	100
Teaching Hours/Week (L: T:P)	3:0:2	SEE Marks	--
Credits	04	Exam Hours	--
Course Objectives: To learn and practical training in electronics components and system in built with elevators, escalators and moving walks etc.			
UNIT-I: - FUNDAMENTALS Basic electrical concepts: DC and AC theory review, Voltage, current, and resistance in elevator systems, Power distribution systems, Circuit protection devices. Elevator Electrical Safety: Lockout/Tag-out procedures, Personal protective equipment, Electrical hazards specific to elevators, Emergency response procedures.			
UNIT – II: - CONTROL SYSTEMS Control Logic: Relay logic systems, Programmable Logic Controllers (PLCs), Microprocessor-based controls, Signal processing and monitoring. Drive Systems: AC motor controls, Variable Frequency and variable voltage Drives (VVVF), Regenerative drives. Positioning Systems: Floor positioning systems, Encoders and sensors, landing systems, Leveling devices.			
UNIT –III: - SAFETY CIRCUITS Safety Circuit Components: Door safety devices, Emergency stop circuits, Overspeed systems, Safety chain analysis. Advanced Safety Features: Advanced door protection, Unintended car movement protection, Earthquake operation, Fire service operation.			
UNIT -IV: - SPECIALIZED SYSTEMS Signal Systems: Hall call systems, Car call systems, Position indicators, Emergency communication systems. Advanced Control Features: Group control systems, access card system, Special Controller features- DCS Troubleshooting: Diagnostic tools, Common electrical faults, Testing procedures.			
UNIT -V: - PRACTICAL APPLICATIONS System Integration: Reading electrical drawings, Component identification, System modifications, Documentation requirements Maintenance & Testing: Periodic testing requirements, Maintenance schedules, Record keeping, Trouble Shooting Technics			

Course Outcomes:

The student will be well versed to the electronics and automation system equipped in the VT equipment and continue with their employment in the VT industry.

CIE Scheme for Evaluation

SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test 1	At the beginning of 2 nd month	90 min	50	Average of 3 Written Test for 50 marks
02	CIE-2	Written Test 2	At the End of 3 rd month	90 min	50	
03	CIE-3	Written Test 3	At the End of 4 th month	90 min	50	
06	E-4	MCQ / Assignment	At the beginning of 3 rd month	-	50	50 marks
Total Continuous Internal Evaluation Marks						100

Textbooks:

- 1) "Electrical Design of Commercial and Industrial Buildings" by John Hauck
- 2) "Electric Motors and Drives: Fundamentals, Types, and Applications" by Austin Hughes and Bill Drury
- 3) "Control Techniques Drives and Controls Handbook" by Bill Drury
- 4) "Electrical Machines, Drives and Power Systems" by Theodore Wildi

Reference books:

- 1) "Fundamentals of Industrial Control" by Donald A. Coggan
- 2) "Power Electronics: Circuits, Devices, and Applications" by Muhammad H. Rashid
- 3) Elevator Mechanical Design" by Lubomír Janovský
- 4) "Practical Electronics for Inventors" by Paul Scherz and Simon Monk

BASIC MEASUREMENT AND METROLOGY FOR VT			
Course Code	PGDVT102	CIE Marks	100
Teaching Hours/Week (L: T:P)	2:0:2	SEE Marks	--
Credits	03	Exam Hours	--
Course Objectives: To learn about the drawing and metrology used in the Vertical Transportation Equipment.			
UNIT- I: - INTRODUCTION TO ENGINEERING DRAWING Introduction to engineering drawing- drawing instruments, standard sizes of drawing sheets, layout of drawing sheets, introduction to dimensioning- elements of dimensioning, systems of dimensioning, dimensioning of common features like diameter, arcs and chords.			
UNIT –II: - DRAWINGS Types of different drawings- architectural drawing, mechanical drawing, electrical drawing.			
UNIT –III: - INTRODUCTION TO MECHANICAL DRAWING Introduction to Auto-CAD drawing, basic drawing and editing commands, advanced editing commands – trim, extend, polyline, spline, text, edit text, hatching – different types, color, simple drawing, save the drawing, plot and print the drawing.			
UNIT – IV: - TOLERANCE and QUALITY CONTROL in Vertical Transportation Introduction – limits, fits – clearance fit, transition fit, interference fit, deviation tolerance, geometric tolerance, quality control.			
UNIT –V: - DIMENSION MEASUREMENT USED in Vertical Transportation Mechanical testing tools: vernier caliper, laser measuring equipment, measuring tape, thickness gauges, slip gauge. Electrical test – analog multimeter, digital multimeter, clamp testers, diagnostics tools used by the VT manufacturer			
Course Outcomes: On completion of this Module/ Unit the student will be learning to read all kind of electrical & mechanical drawing associated with the Vertical transportation equipment. Additionally, the student will be gaining the experiences to use the measuring tools for mechanical, electrical and diagnostic tools used in the VT industry for their day to day working activities.			

CIE Scheme for Evaluation						
SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test 1	At the beginning of 2 nd month	90 min	50	Average of 3 Written Test for 50 marks
02	CIE-2	Written Test 2	At the End of 3 rd month	90 min	50	
03	CIE-3	Written Test 3	At the End of 4 th month	90 min	50	
04	E-4	MCQ / Assignment	At the beginning of 3 rd month	-	50	50 marks
Total Continuous Internal Evaluation Marks					100	100
Textbooks: 1) "Engineering Drawing and Design" by David A. Madsen and David P. Madsen 2) "Basics of Engineering Drawing" by Zahid Ahmad Siddique 3) "AutoCAD 2023 for Beginners" by CAD Artifex						
Reference books: 1) "Mechanical and Electrical Systems for Buildings" by Richard R. Janis and William K. Y. Tao 2) "Mastering AutoCAD 2023 and AutoCAD LT 2023" by Brian C. Benton and George Omura						

STRUCTURE OF ELEVATOR			
Course Code	PGDVT103	CIE Marks	50
Teaching Hours/Week (L: T: P)	3:0:2	SEE Marks	50
Credits	04	Exam Hours	03
Course Objectives: To develop comprehensive knowledge and practical skills in the installation, maintenance and safe operation of vertical transportation systems in modern buildings, with emphasis on safety, efficiency and sustainability.			
UNIT - I: - INTRODUCTION TO VERTICAL TRANSPORTATION OVERVIEW OF VERTICAL TRANSPORTATION: History and evolution of elevator and escalators, types of vertical transportation – elevators, escalators and moving walkways, Types of elevators – hydraulic, traction, applications.			
UNIT - II: - BASIC ENGINEERING PRINCIPLES: mechanical systems and components – traction elevator – drive machine, types of traction brakes - disc traction brake and drum traction brake, traction wire rope. counter weight, car/cabin, guide rails, fish plates, guide brackets, guide shoes, elevator door, load calculation and capacity of the equipment – EN81-1.			
UNIT - III: - ELEVATOR SYSTEM Control systems and automation: control unit, sensors and feedback mechanism – position sensor, speed sensors, door sensors - mechanical safety edge, electronic infrared curtain., load sensors, destination dispatch systems, human interface – COP and LOP.			
UNIT - IV: - SAFETY STANDARDS AND SAFETY FEATURES Safety features in elevator and escalators: over speed governor, emergency brakes, door interlocks, auto rescue device, buffer, emergency alarm and communication systems, backup power supply.			
UNIT -V: - MAINTENANCE PROCEDURES AND TROUBLESHOOTING Maintenance procedures like PPM, routine maintenance RM, emergency response planning, tool box talks, safety features, compliance with standards, log book management/service report preparation, employee and user training.			

Course Outcomes:

To gain the knowledge and practical skill for proper maintenance and safe operation of the VT equipment.

CIE Scheme for Evaluation

SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test	At the beginning of 2 nd month	60 min	30	Average of 3 Written Test for 30 marks
02	CIE-2	Written Test	At the End of 3 rd month	60 min	30	
03	CIE-3	Written Test	At the End of 4 th month	60 min	30	
04	CIE-4	MCQ / Assignment	At the beginning of 3 rd month	-	20	20
Total Continuous Internal Evaluation Marks					50	

Question paper pattern:

The SEE question paper will be set for 100 marks.

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

Textbooks:

- 1) Elevator Engineering" by George R. Strakosch
- 2) "The Vertical Transportation Handbook" by George R. Strakosch and Robert S. Caporale
- 3) "Design and Construction of Modern Elevators" by John L. T. Grindley

Reference books:

- 1) "Mechanical and Electrical Equipment for Buildings" by Walter T. Grondzik and Alison G. Kwok
- 2) "Elevators 101" by Elevator World, Inc.
- 3) "Modern Escalator and Elevator Systems" by Kevin Dougherty

SAFETY IN VERTICAL TRANSPORTATION			
Course Code	PGDVT104	CIE Marks	50
Teaching Hours/Week (L: T :P:)	4:0:0	SEE Marks	50
Credits	04	Exam Hours	03
Course Objectives: Overall training in the vertical transportation safety and procedure to work in the VT industry and create safest working environment in the VT industry with zero accident.			
UNIT-I: - GENERAL SAFETY Introduction to all the safety responsibilities of the employee, additional safety responsibilities of the mechanic/mechanic-in-charge, evacuation procedures in case of emergency and fire safety.			
UNIT – II: - PERSONAL PROTECTIVE EQUIPMENT(PPE) Proper clothing, eye and face protection, occupational head and foot protection, hearing protection, personal fall arrest equipment, hand protection, respiratory protection, emergency procedures and fire safety.			
UNIT –III: - ELECTRICAL SAFETY Introduction to general safety precautions to be assured while working with electrical components, lockout/tagout procedures, personal protective equipment, electrical hazards specific to elevators, emergency response procedures.			
UNIT – IV: - TOOLS AND MATERIAL HANDLING General safety precautions for handling all the hand tools and power tools used in the vertical transportation, portable electric tools and lights, manual handling lifting of material, hoisting and rigging.			
UNIT -V: -DRIVING AND VEHICLE Recognizing hazards, alcohol/drug use, safety belts are for everyone, vehicle maintenance, communication devices.			
Course Outcomes: The student will gain best practices and procedures in terms of safety requirement in the vertical transportation industry.			

CIE Scheme for Evaluation						
SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test	At the beginning of 2 nd month	60 min	30	Average of 3 Written Test for 30 marks
02	CIE-2	Written Test	At the End of 3 rd month	60 min	30	
03	CIE-3	Written Test	At the End of 4 th month	60 min	30	
05	E-4	MCQ / Assignment	At the beginning of 3 rd month	-	20	20
Total Continuous Internal Evaluation Marks						50
Question paper pattern: The SEE question paper will be set for 100 marks. • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each unit. • Each full question will have sub question covering all the topics under a unit. • The students will have to answer five full questions, selecting one full question from each unit.						
Textbooks: 1) "Elevator and Escalator Rescue: A Comprehensive Guide" by Ted Lee and John J. O'Donoghue 2) "Safety and Health in the Use of Machinery" by International Labour Office (ILO) 3) "Vertical Transportation: Elevators and Escalators" by Albert So and Ron Weidmann						
Reference books: 1) "Handbook of Elevator Technology" by Joseph Rathbone Lacon 2) "The Vertical Transportation Handbook" by George R. Strakosch and Robert S. Caporale 3) "International Building Code (IBC)"						

ESCALATORS AND MOVING WALKAWAYS			
Course Code	PGDVT105	CIE Marks	100
Teaching Hours/Week (L: T: P)	3:0:0	SEE Marks	-
Credits	03	Exam Hours	-
Course Objectives: Upon successful completion of the course, students will be able to summarize the basic design, components, operations, functionality and maintenance of escalators, demonstrate basic competency in the proper safety procedures and equipment needed to maximize injury prevention including safety labels, shock hazards, fire safety, work area protocols and lock out - tagout procedures, identify components of escalators design and layout to ensure proper operations, maintenance and control systems, handrails, auto-lubrication systems and braking methods, define safe electrical practices, identify and locate major components in the electrical control systems.			
UNIT-I: - OPERATING PRINCIPLES AND COMPONENTS OF ESCALATORS AND MOVING WALK The core component of the escalator is two chains, which rotate around two pairs of gears. At the top of the escalator, a motor drives the transmission gear to rotate the chain ring. A typical escalator uses a drive machine to turn gears. Both the engine and the chain system are installed in a truss, which refers to a metal structure that extends between two floors. Type of the escalators, utility of the escalators, Mechanical and electrical components of the escalators and moving walks.			
UNIT-II: - SAFETY MECHANISMS AND COMPONENTS IN ESCALATORS Hand rail safety, Step safety, entry and exit sensors, step monitoring safety features, speed monitoring components and features.			
UNIT-III: - INSTALLATION PROCESS OF THE ESCALATORS Off-loading, hoisting the escalators, Truss joining, shifting, Installation of the escalators and moving walks, Step Alignment, hand rail installation.			
UNIT-IV: - ELECTRICAL CONNECTIONS & TESTING COMMISSIONING. Inspection and connection of the Escalator Hand rails sensors, Step Sensors, limit switches, and leveling sensors etc. Auto tuning for the escalator drive and preparation for Testing Commissioning			
UNIT -V: - MAINTENANCE AND TROUBLE SHOOTING Routing maintenance of the escalators, Major and minor repairing of the escalators Trouble shooting technics.			

Course Outcomes:

This comprehensive course provides complete training in Vertical Transportation (VT) systems, preparing students for careers in elevator and escalator maintenance, installation, and testing/commissioning. Upon completion, graduates can enter the VT industry, where they will need to have minimum hands-on experience to further advance their careers in the field.

CIE Scheme for Evaluation

SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test	At the beginning of 2 nd month	80 min	30	Average of 3 Written Test for 30 marks
02	CIE-2	Written Test	At the End of 3 rd month	80 min	30	
03	CIE-3	Written Test	At the End of 4 th month	80 min	30	
05	E-4	MCQ / Assignment	At the beginning of 3 rd month	-	50	50
Total Continuous Internal Evaluation Marks						50

Textbooks:

- 1) "The Vertical Transportation Handbook" by George R. Strakosch and Robert S. Caporale
- 2) "Handbook of Elevator and Escalator Design" by John C. Fries

Reference books:

- 1) "Escalator Design and Installation: A Practical Approach" by David Cooper
- 2) "Elevators, Escalators, and Moving Walkways" by Dr. Gina Barney and Lutfi Al-Sharif
- 3) "Vertical Transportation: Elevators and Escalators" by Albert So and Ron Weidmann

INSTALLATION OF ELEVATOR			
Course Code	PGDVT201	CIE Marks	100
Teaching Hours/Week (L: T: P)	2:0:2	SEE Marks	--
Credits	04	Exam Hours	--
Course Objectives: This part of the study will cover complete mechanical installation procedure of the elevators step by steps.			
UNIT-I: INSTALLATION OF ELEVATORS – STEPS AND PROCEDURES Template installation – purpose, key templates, steps for installation, plumb chart preparation and finalizing the template to resume the installation Wall bracket and guide rail bracket installation – purpose, steps for installing wall brackets and guide rail brackets.			
UNIT - II: - GUIDE RAIL DOOR INSTALLATION Guide rail installation – steps for elevator guide rail installation, joint plate/fish plate, guide rail alignment, installation and inspection. Door installation – installation and adjustment of doors, components involved in elevator door installation, landing doors and car doors panel installation, Alignment and adjustment of car and landing doors			
UNIT –III: - DRIVE MACHINE INSTALLATION Machine installation – preparation, positioning and installing the machine bed plate, installing drive machine installing traction sheave, install rope grippers, connecting to control system. Alignment of the Drive machine and diverting sheave etc.			
UNIT – IV: - CAR FRAME AND COUNTER WEIGHT INSTALLATION Car frame installation – installation and alignment of the elevator car frame, installation and alignment of the elevator safety block. Counter weight frame – preparation for installation, installation of counter weight frame, installation of counter weight blocks, alignment, final inspection and testing, documentation and maintenance, roping – traction ropes and governor ropes.			
UNIT – V: - CABIN INSTALLATION & ROPING Cabin installation – installation and alignment of elevator cabin, counter weight installation, Car Door operator installation. Speed governor installation, Installation of Traction and Governor ropes and tensioning, buffer installation, governor pit pulley installation.			

Course Outcomes:

The student will be familiar with complete installation procedure and gain practical experience enabling them to perform the installation at the work locations.

Scheme for Evaluation						
SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test I	At the beginning of 2 nd month	90 min	50	Average of 3 Written Test for 50 marks
02	CIE-2	Written Test II	At the End of 3 rd month	90 min	50	
03	CIE-3	Written Test III	At the End of 4 th month	180 min	50	
04	E-4	MCQ / Assignment	At the end of 3 rd month	90 min	50	50 marks
Total Continuous Internal Evaluation Marks						100

Textbooks:

- 1) "Elevators 101" by Zack McCain
- 2) "Elevator Installation, Maintenance, and Repair" by Zachary Kirk
- 3) "Field Installation Handbook for Elevator Installers" by Edward A. Donoghue

Reference books:

- 1) "The Vertical Transportation Handbook" by George R. Strakosch and Robert S. Caporale
- 2) "Elevator Mechanical Design" by Lubomír Janovský
- 3) "Modern Elevator Installation" by Lee Gray

SITE SURVEYING AND INSTALLATION			
Course Code	PGDVT202	CIE Marks	100
Teaching Hours/Week (L:P: SDA)	2:2:2	SEE Marks	--
Credits	04	Exam Hours	--
Course Objectives: This course aims to provide a comprehensive understanding of elevator installation, and maintenance, focusing on compliance with safety and operational standards. Students will learn about machine room and space requirements, fire safety systems including sprinklers, shunt trips, and detectors, as well as hoistway and pit standards for accessibility and safety and much more.			
UNIT- I: - MACHINE ROOM/ SPACE REQUIREMENTS Installation Permits, Approved Plans Maintenance, Machine Room Safety Standards - Access and Safety, Fire Safety and Illumination, Physical Space and Environment, Usage Restrictions in Machine Rooms, Maintenance Control Program (MCP).			
UNIT –II: - SPRINKLER, SHUNT TRIP AND DETECTORS Fireman’s Service Implementation, Supervisory Panels for Non-Fire Alarm Buildings, Shunt Trip and Heat Detectors, Heat Detector Specifications and Placement, Sprinkler Piping Compliance,			
UNIT –III: - HOISTWAY AND PITS Hoistway Clearance Standards, Top-of-car Hoistway clearance, Hoistway Wiring, Pit Ladders and Accessibility, Accessibility requirements for ladders from the landing, Pit Lighting and Electrical Requirements, Sump Pumps and Sump Standard, Moisture and Pit Sealing.			
UNIT – IV: - SECONDARY & OVERHEAD SHEAVE SPACE Permanent Access Requirements, Lighting and Electrical Outlets, Stop Switch Installations, Compliance with Electrical Codes, Guard Installation Requirements, Inspection and Maintenance of Guards.			
UNIT –V: -DOCUMENTATION Installation of Elevator, Wiring Standards, Requirements for installing permanent cab flooring, Testing Procedures.			
Course Outcomes: By completing this course, students will acquire comprehensive knowledge of elevator system installation, and maintenance with a focus on safety, compliance, and efficiency. They will understand machine room and hoistway space requirements, fire safety implementations, electrical standards, and accessibility features. Students will be proficient in documenting and managing installations, plan alterations, and testing procedures, ensuring adherence to regulatory standards.			

CIE Scheme for Evaluation						
SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test I	At the beginning of 2 nd month	90 min	50	Average of 2 Written Test for 50 marks
02	CIE-2	Written Test II	At the End of 3 rd month	90 min	50	
03	CIE-3	Skill test -I	At the End of 4 th month	180 min	50	Average of 2 for 50 marks
04	E-4	MCQ / Assignment	At the end of 3 rd month	90 min	50	
Total Continuous Internal Evaluation Marks						100
Textbooks: 1) "Inspection Handbook, 7th Edition" by Zack McCain 2) "The Vertical Transportation Handbook" by George R. Strakosch and Robert S. Caporale.						
Reference books: 1) Elevator Engineering" by George R. Strakosch						

POST-INSTALLATION TESTING AND COMMISSIONING AND REPORT WRITING			
Course Code	PGDVT203	CIE Marks	100
Teaching Hours/Week (L: T:P)	1:0:4	SEE Marks	--
Credits	04	Exam Hours	--
Course Objectives: This course aims to provide students with comprehensive knowledge and practical skills required for the commissioning and inspection of elevator systems. It covers pre-commissioning inspections, mechanical and electrical testing, control system and safety evaluations, operational and system integration tests, and final inspection and certification.			
UNIT- I: - PRE-COMMISSIONING INSPECTIONS Documentation Review - Ensure all installation documentation, including schematics, wiring diagrams, and manufacturer manuals, are available and complete, Visual Inspection - Conduct a thorough visual inspection of the entire elevator system to check for any visible defects or installation errors, Preliminary System Checks - Verify that all components, such as the elevator car, hoist way, doors, and control panels, are correctly installed and secure.			
UNIT –II: - MECHANICAL AND ELECTRICAL TESTING Electrical Testing – Electrical Safety Circuits. Mechanical Testing - Alignment Checks, Load Test, Brake Functionality.			
UNIT –III: - CONTROL SYSTEM AND SAFETY TESTING Control system testing - Parameter Settings, Sensor adjustment Safety Testing - Emergency Stop Test, Emergency Power Operation, Safety Gear and Governor.			
UNIT – IV: - OPERATIONAL AND SYSTEM INTEGRATION TESTING Operational Testing - Door Operation, Ride Quality, Hall and Car Call Testing. System Integration Testing - Intercom and Communication Systems, Fire Alarm Integration, Building Management System (BMS) Integration.			
UNIT –V: - Final Inspection and Certification Third-Party Inspection: Engage a third-party inspector to conduct an independent verification of the elevator's compliance with safety and performance standards. Certification: Obtain the necessary certifications and approvals from relevant authorities, indicating the elevator is safe and ready for operation.			
Course Outcomes: Upon completing this course, students will be able to perform thorough inspections, conduct mechanical and electrical tests, and safety systems, and ensure proper integration with building management systems. They will be able to identifying and resolving installation issues, ensuring regulatory compliance, and preparing elevators for safe and efficient operation.			

CIE Scheme for Evaluation						
SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Written Test I	At the beginning of 2 nd month	90 min	50	Average of 2 Written Test for 50 marks
02	CIE-2	Written Test II	At the End of 3 rd month	90 min	50	
03	CIE-3	Skill test -I	At the End of 4 th month	180 min	50	Average of <u>2</u> for 50 marks
04	CIE-4	MCQ / Assignment	At the end of 3 rd month	90 min	50	
Total Continuous Internal Evaluation Marks						100
Textbooks: 1) "Inspection Handbook, 7th Edition" by Zack McCain 2) "The Vertical Transportation Handbook" by George R. Strakosch and Robert S. Caporale						
Reference books: 1) Elevator Engineering" by George R. Strakosch						

PRACTICAL INSTALLATION LAB						
Course Code		PGDVTL204		CIE Marks		100
Teaching Hours/Week (L: T :P: SDA)		1:0:4:2		SEE Marks		100
Credits		02		Exam Hours		03
Sl. No.	Hands on Training					
1	Installation of Rail brackets Guide Rail Installation Alignment of the guide rails Car door and landing door installation Car door and Landing door alignment Pit Buffer installation process					
2	Connection and testing of Safety circuits Connection of the Limit switches Connection of the door controller system and adjustment Electrical Connection of the LOP, COP, Door lock contacts					
Experiments						
1	Installation of the Elevator Car door/ Landing door					
2	Rectification of the electrical fault in the elevator landing doors					
3	Check the safety circuits malfunction					
4	Identify the faults through the support of the manual and drawings from the manufacturer					
CIE Scheme of Evaluation						
SL No	Assessment	Type	Time Frame	Duration	Max Marks	Conversion
01	CIE-1	Practical Test (Part-1)	End of 2 nd month	180 min	50	Sum of Both the CIE
02	CIE-2	Practical Test (Part-2)	End of 4 th month	180 min	50	
Conduct of Practical Examination: 1. All experiments are to be included for practical examination. 2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners. 3. Students can pick one experiment from the questions lot prepared by the examiners.						

PROJECT WORK					
Course Code	PGDVT205	CIE Marks	100		
Teaching Hours/Week (L: T:P: SDA)	0:0:2:2	SEE Marks	100		
Credits	06	Exam Hours	03		
GUIDELINES					
• The duration of the project will be of 3 months on full time basis while commencement of ii semester. • The students must submit letters from the industry clearly specifying his/ her name and the duration for the project on the company letter head with authorized signature. • Project must be related to the field of specialization of the respective vertical transportation industry in which the student has enrolled. • Students undergoing project are advised to report their progress and submit periodic progress reports to their respective guides. • Students have to present a report of all the project activities carried out to the institute. • The report shall be printed on A4 size with 1.5 spacing and times new roman with a font of size 12. • The report shall be made as per the institute format.					
Course Outcomes: This comprehensive course provides complete training in Vertical Transportation (VT) systems, preparing students for careers in elevator and escalator maintenance, installation, and testing/commissioning. Upon completion, graduates can enter the VT industry, where they will need to have minimum hands-on experience to further advance their careers in the field.					
Scheme of Evaluation					
SL No	Assessment	Type	Duration	Max Marks	Conversion
01	CIE-1	Practical Test	180 min	50	50
Conduction of CIE: Project Details: • Details of Hardware devices • Descriptions of Components • Components Diagram • Detailed Descriptions of Components • Result • Conclusion				50 Marks	
Scheme for SEE: 1. Project Report Submission 2. Practical exam				50 Marks	