

Course Title	ALLENBRADLEY MICROLOGIX 1400:PLC PROGRAMMING AND APPLICATION		
Purpose	PLC programming and troubleshooting		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	01 week		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	After completion of training candidate would be able to perform:- 1 Configure and communication of PLC and PC 2 Explain architecture and identify each module of PLC 3. Programming in PLC		
Teaching methods	1 Lectures 2 Practical 3 Demonstrations		
Assessment methods	❖ Formative assessment consist of following things:		
	Sl No.	Criteria for assessment	
	1	Attendance and Punctuality	
	2	Sincerity	
	3	Ability to grasp the topic	
	❖ Summative assessment through objective type questions consist of following things:		
	Sl No.	Criteria for assessment	
	1	Test consist of practical knowledge	
2	Test consist of theoretical knowledge		
Course schedule	D A Y	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	ADMISSION/INTRODUCTION TO THE COURSE SUBJECT	INTRODUCTION OF MICROLOGIX 1400 PLC, IT'S FEATURES AND APPLICATION
	2	DEMONSTRATION OF SIMULATED PROCESS LIKE WASHING MACHINE, TANK LEVEL CONTROL AND LISTING OF NUMBER OF ACTUATORS AND SENSORS USED FOR EACH PROGRAM	PRACTICE PROGRAM USING DIGITAL SWITCH AS A SENSOR AND RELAY AS ACTUATORS USING PLC. PRACTICE PROGRAM TO CONTROL SIMPLE LIGHTING CIRCUIT
	3	DIFFERENT TYPES OF TIMERS AND PROGRAMMING USING TIMER COUNTERS LIKE UP COUNTER, DOWN COUNTER AND UP-DOWN COUNTER WITH APPLICATION	PRACTICE PROGRAM USING TIMER PRACTICE OF SIMPLE COUNTER PROGRAM TO IMPLEMENT FUNCTION OF EACH COUNTER
	4	PROGRAMMING PRACTICE	PROGRAMMING PRACTICE
	5	PROGRAMMING PRACTICE	REVISION, CONCLUSION AND ASSESSMENT
AIDS	Projector, White board, Micrologix Allenbradley PLC Trainer kit, Computers		
Instruction material	TD/AVTS/AV04/03/CM		

Course Title	INDUSTRIAL CONTROLS OF AC MOTOR WITH PLC		
Purpose	PLC operated control of Motors with Troubleshooting of AC Motors		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	02 weeks		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	<p>After completion of training the candidate would be able to perform:-</p> <p>1 Explain theory and operating characteristics of Contactors,Relays,Timers,Foot Switch,Fuses,Indicating Lamp,CT</p> <p>3 Connection of 3 Phase Induction Motor with Power Supply using all control components in control circuit</p> <p>4 Identify each module of PLC and connection with each other</p> <p>5 Configure and communication of PLC and PC</p> <p>6 Understanding of Digital I/O and Analog I/O application</p> <p>7 Develop various program on PLC to control Motor Starting/Running like DOL, Star Delta Operation, Forward/Reverse Operation</p>		
Teaching methods	<p>1 Lectures in class room</p> <p>2 Practical</p> <p>3 Demonstrations</p>		
Assessment methods	❖ Formative assessment consist of following things:		
	Sl No.	Criteria for assessment	
	1	Attendance and Punctuality	
	2	Sincerity	
	3	Ability to grasp the topic	
	❖ Summative assessment through objective type questions consist of following things:		
	Sl No.	Criteria for assessment	
	1	Test consist of practical knowledge	
2	Test consist of theoretical knowledge		
Course schedule	DAY	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	INTRODUCTION,PURPOSE OF CONTROLS,ELECTRICAL ELEMENTS IN CONTROL CIRCUITS AND THEIR GRAPHICAL SYMBOLS	STUDY OF MEASURING INSTRUMENTS VOLTMETER,AMMETER, MULTIMETER,CLAMP ON METER
	2	CONTROL AND POWER CIRCUITS CONTROL COMPONENTS: CONTACTORS	POWER CIRCUIT FOR ON/OFF OPERATION OF 3 PHASE INDUCTION MOTOR STUDY AND TESTING OF CONTACTORS
	3	THEORY OF TIMERS AND OVERLOAD RELAYS: STUDY OF CONTROL CIRCUIT USING TIMER AND RELAYS	CONNECTION AND TESTING OF TIMERS
	4	CONTROL COMPONENTS: FOOT SWITCH,FUSES,INDICATING LAMPS,SWITCHESON/OFF,FORWARD/REVERSE,PUSH BUTTONS	CONNECTION AND TESTING OF : SWITCHES-ON/OFF,FORWARD /REVERSE,TOGGLE, PROXIMITY,PUSH BUTTONS

	5	HISTORY OF PLC, CATEGORY OF PLC, ADVANTAGE AND ORIGIN OF PLC, CONFIGURATION OF PLC AND ITS DIFFERENT PARTS INTRODUCTION OF SIEMENS LOGO PLC, IT'S FEATURES AND APPLICATION	DEVELOPING SIMPLE LOGIC PROGRAM LIKE AND,OR, NOR,NOT,EX-OR,EX-NOR, NAND PRACTICE PROGRAM TO CONTROL SIMPLE LIGHTING CIRCUIT.
	6	DEMONSTRATION OF SIMPLE INDUSTRIAL PROCESS INTRODUCTION OF S7 200 PLC, ITS ARCHITECTURE, PANEL CIRCUIT DIAGRAM	PRACTICE PROGRAM USING DIGITAL SWITCH AS A SENSOR AND RELAY AS A ACTUATORS USING MICRO LOGO PLC.PRACTICE PROGRAM
	7	DEVELOPING UNDERSTANDING OF DIFFERENT TYPES OF TIMERS COUNTERS,COUNTER WITH APPLICATION	PRACTICE PROGRAM USING TIMER PRACTICE OF SIMPLE COUNTER PROGRAM TO IMPLEMENT FUNCTION OF EACH COUNTER
	8	CONTROL CIRCUIT FOR 3 PHASE INDUCTION MOTOR/MANUAL AND PLC CONTROLS	CONNECTION OF MOTOR :POWER AND CONTROL CIRCUIT
	9	INTRODUCTION OF SINGLE PHASE/THREE PHASE INDUCTION MOTOR, CIRCUIT DIAGRAM TO CONNECT MOTOR USING STARTER CIRCUIT CONNECTION OF 3 PHASE MOTOR USING LOGO PLC CONTROLS, DOL START, STAR/DELTA START	CONVENTIONAL CONTROL OF MOTOR USING START PB, STOP PB AND MAIN CONTACTOR, PRACTICE OF CONNECTING MOTORS IN STAR/ DELTA AND DOL USING MANUAL METHODS PRACTICE PROGRAM (A) START-JOG-STOP (B)FORWARD/REVERSE OF MOTORS
	10	TROUBLESHOOTING AND MAINTENANCE OF ELECTRICAL CONTROL ELEMENTS	REVISION, CONCLUSION AND ASSESSMENT
AIDS	Projector, white board, Laptop, Logo PLC Trainer kit, PLC S7 200 Trainer Kit, Three Phase Induction Motor Trainer Kit, Control components		
Instruction material	TD/AVTS/AV04/04/CM		

Course Title	AC ELECTRIC MOTORS TESTING ,OPERATION AND MAINTENANCE		
Purpose	Operation/Control & Maintenance of AC Electric Motors		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	02 weeks		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	After completion of training the candidate would be able to perform:- 1 Operation and control all types of 1 phase and 3 phase AC Motor 2 Operation of control components: Push Buttons, Toggle Switches, Proximity switches (Inductive, Capacitive, Photo sensors) 3 Connection of 3 Phase Induction Motor with Power Supply using all control components in control circuit 4 Connection and reading of measuring instruments connected to Motor		
Teaching methods	1 Lectures in class room 2 Practical 3 Demonstrations		
Assessment methods	❖ Formative assessment consist of following things:		
	Sl No.	Criteria for assessment	Maximum Marks
	1	Attendance and Punctuality	20
	2	Sincerity	20
	3	Ability to grasp the topic	10
	❖ Summative assessment through objective type questions consist of following things:		
	Sl No.	Criteria for assessment	Maximum Marks
	1	Test consist of practical knowledge	30
2	Test consist of theoretical knowledge	20	
Course schedule	DAY	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	INTRODUCTION,SINGLE PHASE & THREE PHASE CIRCUITS,STAR AND DELTA CONNECTIONS	STAR CONNECTION DELTA CONNECTION WITH LAMP LOAD AND ANALYSIS OF CIRCUIT
	2	THREE PHASE MOTORS: SQUIRREL CAGE INDUCTION MOTOR	CONNECT, START, RUN A 3 PHASE SCIM. TO MEASURE PHASE VOLTAGE OF MOTOR WINDING IN STAR AND DELTA CONNECTION. TO CHANGE THE DIRECTION OF ROTATION BY MEANS OF REVERSING SWITCH. TO CONNECT AND START A THREE PHASE SCIM: MEASURE STARTING CURRENT IN STAR AND DELTA.START MOTOR WITH STAR/DELTA SWITCH
	3	THREE PHASE MOTORS: SQUIRREL CAGE INDUCTION MOTOR	LOAD TESTING OF 3 PHASE INDUCTION MOTOR.TO CONNECT AND START A THREE PHASE SLIP RING INDUCTION MOTOR. NOTE DOWN THE SPEED AT VARIOUS ROTOR RESISTANCE STEPS AND CHANGE DIRECTION OF ROTATION

	4	THREE PHASE MOTORS: SLIP RING INDUCTION MOTOR THREE PHASE MOTORS POLE CHANGING INDUCTION MOTOR	LOAD TEST TO CONNECT AND RUN A THREE PHASE SQUIRREL CAGE POLE CHANGEABLE INDUCTION MOTOR. CHANGE THE SPEED WITH POLE CHANGING SWITCH
	5	TYPES OF ENCLOSURE STARTING METHODS OF 3 PHASE SCIM	STUDY OF STARTERS CONNECTION AND RUNNING OF MOTOR WITH DOL,STAR/ DELTA AND AUTO TRANSFORMER STARTERS.
	6	POWER FACTOR SYNCHRONOUS MOTOR	TO CONNECT AND RUN A THREE PHASE SCIM WITHOUT CAPACITOR BANK AND WITH CAPACITOR BANK STARTING METHODS OF SYNCHRONOUS MOTOR,V CURVES
	7	SELECTION OF SINGLE PHASE MOTORS INDUCTION,REPULTION,AC SERIES AND SYNCHRONOUS	STUDY OF TERMINALS STARTING METHODS
	8	MOTOR PROTECTION THEORY OF CAPACITOR INDUCTION,REPULSION,SHADDED POLE, UNIVERSAL MOTORS	CONNECTION OF MOTOR : CAPACITOR INDUCTION,REPULSION,SHADED POLE, UNIVERSAL MOTORS
	9	MAINTENANCE SCHEDULE OF AC MOTORS MOTOR TROUBLESHOOTING	MOTOR TROUBLESHOOTING
	10	MAINTENANCE OF CONTROL COMPONENTS	REVISION, CONCLUSION AND ASSESSMENT
AIDS	Projector, white board, Laptop, Three Phase Induction Motor Trainer Kit, Single/three phase ac motor various types, slip ring induction meter, synchronous motor and all measuring instrument.		
Instruction material	TD/AVTS/AV04/05/CM		

Course Title	STARTERS AND SOFT STARTER		
Purpose	Operation and Troubleshooting of Starters and Soft starters		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	01 week		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	After completion of training the candidate would be able to perform:- 1 Identification of each part ,connection and operation of Starters 2 Connection of 3 Phase Induction Motor with Power Supply and different types of Starters, 3 phase motors in Inline and Inside Delta as required 4 Identification of parts of soft starter system 5 Connection and operation of 3 phase motor through soft starter		
Teaching methods	1 Lectures 2 Practical 3 Demonstrations		
Assessment methods	❖ Formative assessment consist of following things:		
	Sl No.	Criteria for assessment	
	1	Attendance and Punctuality	
	2	Sincerity	
	3	Ability to grasp the topic	
	❖ Summative assessment through objective type questions consist of following things:		
	Sl No.	Criteria for assessment	
	1	Test consist of practical knowledge	
2	Test consist of theoretical knowledge		
Course schedule	DAY	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	INTRODUCTION OF 3 PHASE AC MOTOR, WORKING PRINCIPLE, ,STARTING PURPOSE & METHODS, DOL STARTER	DEMONSTRATION OF VARIOUS PARTS OF 3 PHASE AC MOTOR, TERMINALS , CONNECTIONS,STUDY AND CONNECTION OF DOL STARTER
	2	AUTOTRANSFORMER METHOD- ADVANTAGES,DISADVANTAGES STAR DELTA CONNECTIONS,	STARTING OF 3 PHASE AC MOTOR BY AUTOTRANSFORMER AND STAR DELTA STARTER
	3	SOFT STARTER-WORKING PRINCIPLES, GENERAL FEATURES/FUNCTIONS, WARNING, FAULT.	STUDY OF SOFT STARTER TRAINER KIT, IDENTIFICATION OF EACH PART AND STUDY OF LINE DIAGRAM, CONTROL AND POWER CIRCUIT.
	4	CONNECTIONS: INLINE & INSIDE DELTAPROGRAMMABLE INPUTS, PROGRAMMABLE OUTPUT RELAYS	SETTINGS ON SOFT STARTER AS PER APPLICATION
	5	SETTINGS AND CONFIGURATION TROUBLESHOOTING AND FAULTS	REVISION, CONCLUSION AND ASSESSMENT
AIDS	LCD projection, white board, Computer, Soft starter Trainer kit, three phase induction motor		
Instruction material	TD/AVTS/AV04/06/CM		

Course Title	SIMATIC S7 300:PLC PROGRAMMING AND APPLICATION		
Purpose	PLC programming and troubleshooting		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	01 week		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	After completion of training candidate would be able to perform:- 1 Configure and communication of PLC and PC 2 Explain architecture and identify each module of PLC 3. Programming in PLC		
Teaching methods	1 Lectures in class room 2 Practice sessions 3 Demonstrations		
Assessment methods	❖ Formative assessment consist of following things:		
	Sl No.	Criteria for assessment	Maximum Marks
	1	Attendance and Punctuality	20
	2	Sincerity	20
	3	Ability to grasp the topic	10
	❖ Summative assessment through objective type questions consist of following things:		
	Sl No.	Criteria for assessment	Maximum Marks
	1	Test consist of practical knowledge	30
2	Test consist of theoretical knowledge	20	
Course schedule	DAY	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	ADMISSION/INTRODUCTION TO THE COURSE SUBJECT	INTRODUCTION OF SIEMENS S7 300 PLC, IT'S FEATURES AND APPLICATION
	2	DEMONSTRATION OF SIMULATED PROCESS LIKE WASHING MACHINE, TANK LEVEL CONTROL AND LISTING OF NUMBER OF ACTUATORS AND SENSORS USED FOR EACH PROGRAM	PRACTICE PROGRAM USING DIGITAL SWITCH AS A SENSOR AND RELAY AS ACTUATORS USING PLC. PRACTICE PROGRAM TO CONTROL SIMPLE LIGHTING CIRCUIT
	3	DIFFERENT TYPES OF TIMERS AND PROGRAMMING USING TIMER COUNTERS LIKE UP COUNTER, DOWN COUNTER AND UP-DOWN COUNTER WITH APPLICATION	PRACTICE PROGRAM USING TIMER PRACTICE OF SIMPLE COUNTER PROGRAM TO IMPLEMENT FUNCTION OF EACH COUNTER
	4	PROGRAMMING PRACTICE	PROGRAMMING PRACTICE
	5	PROGRAMMING PRACTICE	REVISION, CONCLUSION AND ASSESSMENT
AIDS	LCD projection, white board, Computer, S7 300 PLC Trainer kit		
Instruction material	TD/AVTS/AV04/07/CM		

Course Title	APPLICATION OF SIEMENS: LOGO & S7 200 MICRO PLC		
Purpose	PLC programming and troubleshooting		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	01 week		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	After completion of training candidate would be able to perform:- 1 Configure and communication of PLC and PC 2 Explain architecture and identify each module of PLC 3. Programming in PLC		
Teaching methods	1 Lectures 2 Practical 3 Demonstrations		
Assessment methods	❖ Formative assessment consist of following things:		
	Sr No.	Criteria for assessment	Maximum Marks
	1	Attendance and Punctuality	20
	2	Sincerity	20
	3	Ability to grasp the topic	10
	❖ Summative assessment through objective type questions consist of following things:		
	Sr No.	Criteria for assessment	Maximum Marks
	1	Test consist of practical knowledge	30
2	Test consist of theoretical knowledge	20	
Course schedule	DAY	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	ADMISSION/INTRODUCTION TO THE COURSE SUBJECT	INTRODUCTION OF MICRO LOGO PLC, IT'S FEATURES AND APPLICATION
	2	DEMONSTRATION OF SIMULATED PROCESS LIKE WASHING MACHINE, TANK LEVEL CONTROL AND LISTING OF NUMBER OF ACTUATORS AND SENSORS USED FOR EACH PROGRAM	PRACTICE PROGRAM USING DIGITAL SWITCH AS A SENSOR AND RELAY AS ACTUATORS USING PLC. PRACTICE PROGRAM TO CONTROL SIMPLE LIGHTING CIRCUIT
	3	DIFFERENT TYPES OF TIMERS AND PROGRAMMING USING TIMER COUNTERS LIKE UP COUNTER, DOWN COUNTER AND UP-DOWN COUNTER WITH APPLICATION	INTRODUCTION OF MICRO LOGO PLC, IT'S FEATURES AND APPLICATION
	4	PROGRAMMING PRACTICE	PROGRAMMING PRACTICE
	5	PROGRAMMING PRACTICE	REVISION, CONCLUSION AND ASSESSMENT
AIDS	Projector, White board, Computer, LOGO PLC Trainer kit, S7 200 PLC Trainer Kit		
Instruction material	TD/AVTS/AV04/08/CM		

Course Title	AC DRIVE MICRO MASTER 440		
Purpose	Operation and Troubleshooting of AC Drive		
Eligibility	Diploma/Degree in Electrical/Electronic Engineering or NTC/NAC with 2-3 years experience		
Duration	01 week		
Location	ADVANCED TRAINING INSTITUTE, MUMBAI		
Learning outcomes	1 Operation of AC Drive with three Phase Induction Motor, 2 Identification of parts of AC Drive panel/system 3 Uploading of parameters/Commissioning of Induction Motor for operation 4 Editing of parameter for desired operation of 3 Phase AC Motor		
Teaching methods	1 Lectures 2 Practical sessions 3 Demonstrations		
Assessment methods	❖ Formative assessment consist of following things:		
	Sl No.	Criteria for assessment	
	1	Attendance and Punctuality	
	2	Sincerity	
	3	Ability to grasp the topic	
	❖ Summative assessment through objective type questions consist of following things:		
	Sl No.	Criteria for assessment	
	1	Test consist of practical knowledge	
2	Test consist of theoretical knowledge		
Course schedule	DAY	FORENOON SESSION (9.00 AM – 1.00 PM)	AFTERNOON SESSION (1.30 PM – 5.30 PM)
	1	ADMISSION/INTRODUCTION TO THE COURSE SUBJECT	<u>INTRODUCTION OF 3 PHASE AC MOTOR, TYPES APPLICATIONS AND DEMONSTRATION</u>
	2	SPEED CONTROL OF 3 PHASE SQUIRREL CAGE INDUCTION MOTOR POLE CHANGING VARIABLES VOLTAGE AT INPUT INTRODUCTION TO RECTIFIER, INVERTER	STUDY AND CONNECTION OF CONTROL AND POWER CIRCUIT DIAGRAM OF 3 PHASE SQUIRREL CAGE INDUCTION MOTOR FOR SPEED CONTROL BY POLE CHANGING VARIABLES VOLTAGE AT INPUT ASSEMBLY OF SIMPLE AC VOLTAGE CONTROL CIRCUIT. DEMONSTRATION OF FIRING ANGLE OF SCR ON CRO
	3	CONVERTER-INVERTER STAGE OF AC DRIVE, FEATURES, BLOCK DIAGRAM, INSTALLATION AND COMMISSIONING	SPECIFICATION OF AC DRIVE, IDENTIFICATION OF EACH PART AND IT'S ROLE IN CIRCUIT. PARAMETERIZATION OF MM440 DRIVE
	4	PARAMETERIZATION OF AC DRIVE MM 440	PARAMETERIZATION OF AC DRIVE MM 440
	5	Parameterization of MM440 Drive Fault and troubleshooting	Revision, Conclusion and Assessment
AIDS	Projector, White board, AC Drive MM 440 Trainer kit, SCIM Motor		
Instruction material	TD/AVTS/AV04/01/CM, TD/AVTS/AV04/01/PPT		