SIEMENS

Industry Relevant Skill Development Program for Gujarat

Siemens Centre of Excellence
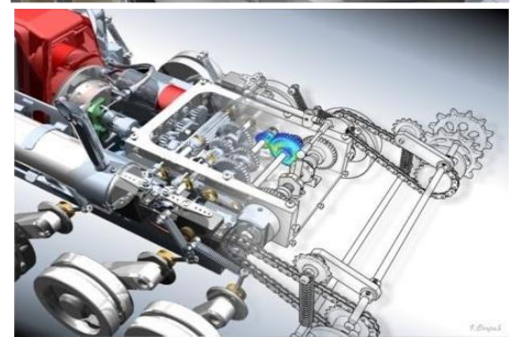# Course Plan

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In Partnership with ● DesignTech

Labs in the Siemens COE

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4	Electrical Lab	1	24
5	Process Control Lab	1	24
6	Mechatronics Lab	1	24
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Courses offered at Centre of Excellence

1.1 Product Design and Validation Lab

S.No	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
1	CAD	Essentials for NX Designers	40	None	
2	CAD	NX Basic Design	16	None	
3	CAD	Synchronous Modeling Fundamentals	8	Essentials for NX Designers	
4	CAD	Synchronous Modeling and Parametric Design	24	Essentials for NX Designers	
5	CAD	Intermediate NX Design and Assemblies	40	Essentials for NX Designers	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
6	CAD	Drafting Essentials	24	Essentials for NX Designers/NX Basic Design	
7	CAD	Mechanical Freeform Modeling	40	• Essentials for NX Designers • Intermediate NX Design and Assemblies	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
8	CAD	NX Sheet Metal	16	• Essentials for NX Designers • Intermediate NX Design and Assemblies	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
9	CAD	Routing Electrical	16	• Essentials for NX Designers • Intermediate NX Design and Assemblies	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
10	CAD	Routing	16	• Essentials for NX	Synchronous

S.No	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
		Mechanical		Designers • Intermediate NX Design and Assemblies	Modeling Fundamentals/Synchronous Modeling and Parametric Design
11	CAD	Large Assemblies Management	24	• Essentials for NX Designers • Intermediate NX Design and Assemblies • Mechanical Freeform Modeling	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
12	CAD	Industrial Design using NX	32	• Essentials for NX Designers • Intermediate NX Design and Assemblies • Mechanical Freeform Modeling	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
13	CAD	PCB Exchange	8	• Essentials for NX Designers • Intermediate NX Design and Assemblies • Routing Electrical	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
14	CAD	Sketching Fundamentals	16	• Essentials for NX designers/NX Basic Design • Drafting Fundamentals	
15	CAD	Product and Manufacturing Information	8	• Essentials for NX Designers • Intermediate NX Design and Assemblies • Mechanical Freeform Modeling	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design
16	CAE	Motion Simulation	24	• Essentials for NX Designers/NX Basic Design	
17	CAE	Advanced Simulation Process	24	• Essentials for NX Designers/NX Basic Design	
18	CAE	Introduction to Finite Element	24	• Essentials for NX Designers/NX Basic	

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S.No	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
		Analysis with NX		Design • Advanced Simulation Process	
19	CAE	Advanced simulation Solutions	16	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process	
20	CAE	Thermal and Flow analysis	24	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process	
21	CAE	NX Response Simulation	24	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process	
22	CAE	Laminate Composites	8	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process	
23	CAE	NX Nastran Advanced Non-linear	24	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process • Introduction to finite element analysis with NX	
24	CAE	Sensitivity and optimization with NX	16	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process • Introduction to finite element analysis with NX	NX Nastran Advanced Non-linear

S.No	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
25	CAE	Super Element Analysis with NX	16	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process • Introduction to finite element analysis with NX	NX Nastran Advanced Non-linear
26	CAE	Advanced Thermal and Flow Analysis	16	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process & Thermal and Flow Analysis	
27	CAE	Advanced Dynamic Analysis with NX	16	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process • NX Response simulation	
28	CAE	Introduction to Dynamic Analysis with NX	24	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process • Introduction to finite element analysis with NX	
29	CAE	DDAM analysis with NX	8	• Essentials for NX Designers/NX Basic Design • Advanced Simulation Process • Introduction to finite element analysis with NX • Introduction to Dynamic Analysis using NX • Advanced Dynamic Analysis using NX	
30	CAD	Mold Wizard	40	• Essentials for NX Designers • Intermediate NX Design and Assemblies • Mechanical Freeform Modeling	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design

S.No	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
31	CAD	Progressive Die wizard	40	• Essentials for NX Designers • Intermediate NX Design and Assemblies • Mechanical Freeform Modeling • NX Sheet Metal	Synchronous Modeling Fundamentals/Synchronous Modeling and Parametric Design

1.2 Advanced Manufacturing Lab

S. No.	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
32	CAM	NX Manufacturing Fundamentals	24	• Essentials for NX Designers/NX Basic Design	
33	CAM	Turning Manufacturing Process	24	• Essentials for NX Designers/NX Basic Design • NX Manufacturing Fundamentals	
34	CAM	Fixed Axis and Multi-Axis Milling	32	• Essentials for NX Designers/NX Basic Design • NX Manufacturing Fundamentals	
35	CAM	NX CAM Customization	16	• Essentials for NX Designers/NX Basic Design • NX Manufacturing Fundamentals	
36	CAM	Post Building Techniques	32	• Essentials for NX Designers/NX Basic Design • NX Manufacturing Fundamentals • NX CAM customization	
37	DM	Process Designer Basic	24	None	

S. No.	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
38	DM	Process Simulate Part Flow	32	Introduction to Teamcenter	Using Teamcenter
39	DM	Process Simulate Human Simulation	40	Introduction to Teamcenter	Using Teamcenter
40	DM	Process Simulate Basic Robotics	40	Introduction to Teamcenter	Using Teamcenter
41	DM	Process Designer for General Assembly	16	Process Designer Basic	
42	DM	Variant Definition and Application	24	Process Designer Basic	
43	DM	Process Designer for Body-In-White Processing	8	Process Designer Basic	
44	DM	Process Simulate Intermediate Robotics	32	Process Simulate Basic Robotics	
45	DM	Process Simulate Advanced Robotics Simulation	24	• Process Simulate Basic Robotics • Process Simulate Intermediate Robotics	
46	DM	RobCAD Basics	16	• Process Designer Basic • Process designer for General Assembly • Process Designer for BIW processing	Variant Definition and Application
47	DM	RobCAD Spot	24	RobCAD Basics	
48	DM	RobCAD Paint	24	RobCAD Basics	
49	DM	RobCAD Arc	24	RobCAD Basics	
50	DM	RobCAD Adv Modelling & Kinematics	16	• RobCAD Basics • RobCAD spot	
51	DM	RobCAD OLP	24	• RobCAD Basics • RobCAD Spot • RobCAD Paint • RobCAD Arc	

S. No.	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
				• RobCAD Adv Modelling and Kinematics	
52	DM	Plant Simulation Methods, and Strategy	40	• Process Simulate Human Simulation • Process Simulate Basic Robotics, • Process Simulate Intermediate Robotics • Process Simulate Advanced Robotic Simulation	
53	DM	Plant Simulation Adv Modelling	32	Plant Simulation Methods, and Strategy	
54	DM	Plant Simulation 3D Visualization	16	Plant Simulation Methods, and Strategy	
55	PLM	Using Teamcenter	32	None	
56	PLM	Introduction to Teamcenter	8	None	
57	PLM	Mockup	24	None	
58	PLM	Integration for NX users	8	Introduction to Teamcenter	
59	PLM	Schedule Manager	16	Introduction to Teamcenter	
60	PLM	Managing Requirements using Teamcenter	16	Introduction to Teamcenter	
61	PLM	Manufacturing Assembly Process Planning	24	Introduction to Teamcenter	
62	PLM	Manufacturing Assembly Part Planning	8	Introduction to Teamcenter	
63	PLM	Managing Systems Design using Tc	16	• Introduction to Teamcenter • Managing Requirements using TC	
64	PLM	Installation	40	• Introduction to	

S. No.	Domain	Course Name	Hours	Mandatory Prerequisite	Optional
				Teamcenter • Using Teamcenter	
65	PLM	Application and Data Model Administration	40	• Introduction to Teamcenter • Using Teamcenter	
66	PLM	Customization	40	• Using Teamcenter • Application and Data Model Administration	
67	PLM	Advanced Workflow and Security Admin	24	• Using Teamcenter • Application and Data Model Administration	

1.3 Process Instrumentation Lab

S.No	Domain	Course Name	Hours	Curriculum	Prerequisites
1	Process Instrumentation	Basic of Process Instrumentation	50	• FLOW measurement • LEVEL measurement • PRESSURE Measurement • TEMPERATURE Measurement • ELECTROPENUMATIC POSITONER	Electrical, Electronics, Mechanical, Instrumentation engineers (2nd year completed)
2	Process Instrumentation	SIMATIC PCS 7 Basics	50	• Introduction to standard architecture of PCS 7. • Introduction to Automation System Hardware. • Working with SIMATIC Manager in PCS 7 way. • Creating the project and Configuring Hardware's (AS & OS). • Working with Plant Hierarchy.	Electrical, Electronics, Mechanical Instrumentation engineers (2nd year completed)

1.4 Automation Lab

S. No.	Domain	Course Name	Hours	Curriculum	Prerequisites
1	**Automation**	Basics of PLC	50	• Constituents of PLC, • How PLC Work, • SIMATIC S7-PLC • Introduction to HMI • STEP 7 blocks and structured programming • Using Data Blocks. • Use of Organisation Blocks	Electrical, Electronics, Mechanical, Instrumentation engineers (2nd year completed)
2	**Automation**	Basic Scada	50	• System overview of SIMATIC WinCC • Graphics Designer and graphics displays for human machine interfacing • User Administration • Background processing (introduction of Global Scripts) • Report Designer for logging (introduction)	Electrical, Electronics, Mechanical, Instrumentation engineers (2nd year completed)

1.5   Electrical Lab

S.No	Domain	Course Name	Hours	Curriculum	Prerequisites
1	**Electrical**	Basic Course on Ac - Dc Drives	40	• DC Motor Basics, • DC Drives Basics, • Siemens DC Drives (6RA80), • AC Motor Basics, • AC Drives Basics, • AC Drives (Sinamics S & G)-Ratings, • MEDIUM VOLTAGE, • MV Transformers	Electrical, Electronics, Mechanical Instrumentation engineers (2nd year completed)
2	**Electrical**	Basic Power Systems	40	• Basic Of power distribution • Philosophy of Generation, distribution in LV, MV & HV • Types of network • Faults & Fault level calculations • Basic Of protection • Types of Fault	Electrical, Electronics, Mechanical Instrumentation engineers (2nd year completed)
3	**Electrical**	Basics of Induction Motors	24	• Basics of Electricity • Efficiency of induction motor-Various losses in the induction • Product spectrum of Siemens motor. • Advance control of induction motor-SIMOCODE overview • Speed Torque Characteristics, Effects of supply variations over the motor performance	Electrical, Electronics, Mechanical Instrumentation engineers (2nd year completed)
4	**Electrical**	Low Voltage Switch gear	40	• Simaris Curve simulation • Low Voltage offerings in Power Distribution in Industry today • DIN Fuse – Importance of fuses • Overview of Pac meter • Overload Relay, Microprocessor Relay	Electrical, Electronics, Mechanical Instrumentation engineers (2nd year completed)

1.6 Mechatronics Lab

S.No	Domain	Course Name	Hours	Curriculum	Prerequisites
1	**Mechatronics**	Basic Mechatronics	50	• Introduction to the module, • Fundamentals of Electrical Components, • Mechanical Components, • Pneumatic Components, • Interpretation of Technical Documents, • Digital Fundamentals & PLC	Electrical, Electronics, Mechanical, Instrumentation engineers (2nd year completed)

1.7 Machine Lab

CIM Lab

S.No	Domain	Equipment	Hours	Curriculum
1	**Computer Integrated Manufacturing**	FLEXTURN-Siemens 828D	24	Introduction to Turning center Overview of Siemens 828D Key board and Screen layout Overview of different operating areas Overview of different modes Cutting tools and parameter selection Introduction to part programs and structure Overview of G and M codes Programming on Siemens standard cycles Hands on practical -Tool offset Hands on practical – All standard cycles Overview of CIM interface Basic preventive maintenance – FLEX TURN
2	**Computer Integrated Manufacturing**	FLEXMILL- Siemens 828D	24	Introduction to Machining center Overview of Siemens 828D Key board and Screen layout Overview of different operating areas Overview of different modes Cutting tools and parameter selection Introduction to part programs and structure Overview of G and M codes Programming on Siemens standard cycles Hands on practical -Work offset and Tool offset Hands on practical – All standard cycles Overview of CIM interface

S.No	Domain	Equipment	Hours	Curriculum
				Basic preventive maintenance – FLEXMILL
3	**Computer Integrated Manufacturing**	**Aristo Robot 6 axis**	8	Introduction to Robotics Overview of M-Robot Software Robot online programming Hands on practice – Materiel handling applications CIM Interface
4	**Computer Integrated Manufacturing**	**ASRS**	24	Hands on practice – Manual mode Hands on practice -CIM mode
		Assembly Station		Hands on practice – Manual mode Hands on practice -CIM mode
		Vision Inspection sensor		Overview of vision software Preparation of Inspection programs CIM Interface
		AGV		Hands on practice – Manual mode Hands on practice -CIM mode
		CIM software		Overview of CIM software CIM – offline programming CIM – Online programming Interfacing of Work cell equipments Execution of CIM system – Various sequence of operations

CNC Lab

S.No	Domain	Course Name	Hours	Curriculum	Prerequisites
1	**Manufacturing**	Basics of CNC machines	50	• History of CNC • Definition of CNC • NUMERICALLY CONTROLLED M/C TOOLS • CNC TURNING MACHINE • CNC MILLING MACHINE • CNC LASER CUTTING • CNC PLASMA CUTTING • CNC PRESS • CNC RAPID PROTOTYPING • Mechanical elements of CNC machines • MACHINE CONTROL UNIT • PES of CNC CONTROL SYSTEMS	Mechanical engineers(2nd year completed)

S.No	Domain	Course Name	Hours	Curriculum	Prerequisites
				• STEPPER MOTORS • Servo motors	
2	**Manufacturing**	NC- Numerical control programming	50	• ISO MACHINE TOOL AXIS DEFINITION • Axis nomenclature – Right hand thumb rule • Rotational and additional axes • Right hand rule - Vertical Machine & Horizontal Machine • Part programming structure • G Codes • N Codes • X, Y, and Z Codes • Explanation of letters in CNC programming • Rapid traverse movement – G00 • Introduction of standard TURNING cycles • Introduction of standard MILLING cycles • Introduction of standard DRILLING cycles • Introduction of special commands in programming	Mechanical engineers (2nd year completed)
3	**Manufacturing**	Basics of CNC Machines	50	• Basic concepts, mechanical systems for electronics engineer • Drives • Spindle drives • Feed Drives • DC Motors • Servo Principle • Drive optimization • Wiring of electrical cabinets • Power supply for CNC machines	Electrical and Electronics engineers(2nd year completed)

Siemens Certification

On successful completion of course and assessment, a student will be issued a *Siemens Certificate.*

A sample layout of the certificate is as follows: