

ANNEXURE-8

**Details of valuation of investment made by the
Government, (APSSDC) SIEMENS or Design Tech**



REPORT ON THE VALUATION OF SIEMENS PROJECT OF SKILL DEVELOPMENT IN ANDHRA PRADESH

By

**MSME TOOL ROOM HYDERABAD
CENTRAL INSTITUTE OF TOOL DESIGN**

(An ISO 9001:2008, 14001:2004, 29990:2010, 50001:2011 certified Institution)

(A Govt of India Society – Ministry of Micro, Small & Medium Enterprises)

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संदर्भ :
Ref. :

दिनांक : 8.03.2016
Date :

Report on Valuation of Siemens Project of Skill Development in Andhra Pradesh

1.0 Introduction

Andhra Pradesh State Skill Development Corporation, Hyderabad and Siemens are in the process of establishing SIEMENS Centres of Excellence and Technical Skill Development Institutions in the State of Andhra Pradesh and requested the Institute's services in Valuation of the project installations vide letter no. SIEMENS Project/2015 Dated 5.12.2015. The Institute has accepted to carry out the Valuation of the project installations vide this office letter no. CITD/PS/GEN/2015 dated 9.12.2015. Accordingly, the aforesaid work has been entrusted to CITD by Skill Development, entrepreneurship & innovation Dept., APSSDC's letter no. MD & CEO/2015 dated 18.12.2015.

1.1 Introduction to Central Institute of Tool Design

Central Institute of Tool Design, Hyderabad is the first Tool Room setup by the Govt. of India in 1968 to meet the requirement of providing the skills required for designing and manufacturing tools and machinery components in India. CITD, Hyderabad became a Govt. of India Autonomous Body in 1970. CITD, Hyderabad is the foremost Organization in India in designing and fabricating tools, dies, jigs & fixtures. CITD also manufactures components for H.A.L., B.A.R.C., D.R.D.O., Ordnance Factories and other Govt. PSUs in aerospace and nuclear energy. CITD has also facilities in VLSI and Embedded Systems in designing and testing electronic chips. CITD conducts skill imparting programs in both mechanical and electronic fields ranging from one week to 4 years including Diploma Courses, Post Graduate Certificate to M.E. and M. Tech. Courses.

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(आईएसओ 9001:2008, आईएसओ 14001:2004, आईएसओ 29990:2010, आईएसओ 50001:2011 प्रमाणित संस्था)

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1.2 A report on the Valuation of the Siemens Project of Skill Development in Andhra Pradesh, as per Government of Andhra Pradesh Skill Development Corporation, Hyderabad letter no. SIEMENS Project/2015 dated 5.12.2015, is given in the succeeding pages.

**THE ANDHRA PRADESH GOVERNMENT AND SIEMENS SKILL
DEVELOPMENT PROJECT**

Industry Skill Development Program

2.0 Background: Skills for the future

2.0.1 Indian Demand – Supply gap made worse with Unemployable skills

- Industry requires 347 million “technically” skilled manpower over 10 years for sustaining it’s growth.
- Training infrastructure needs to grow 8X in 10 years plus not enough skilled trainers available.

2.1 Background: Skill Development in Andhra Pradesh

2.1.1 Investor friendliness and attractive incentives for industry

Andhra Pradesh, with its large coast line, has a great potential for exports and for heavy engineering. With electronic & automobile clusters coming up and 200 industries to be setup, with Sri City in South Andhra Pradesh there is a huge requirement of skilled employees.

2.1.2 Challenges for Andhra Pradesh

- Lower than average HDI ranking.
- Employment fell in 2013 in manufacturing, textiles & infrastructure.
- Demand-Supply gap of 1.1 million skilled manpower (25%) by 2015 (Demand ~4.5mn, Supply ~3.4mn).

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- Incremental demand 2X of incremental supply by 2016-17, increasing demand-supply gap.
- Incremental demand for skilled worker is 59% and semi skilled is 18%, thus large workforce will move from agriculture to other sectors.

2.1.3 Employable skilled labor: Currently supply only 31% of total demand

The existing Polytechnic, ITI and Vocational Training Centers are inadequate to meet the requirement of the State in skilled manpower.

Goal of the Project : Build a self-sustainable, interactive, industry-relevant, cyber-physical learning platform to bridge India's Technical Skill Gap

3.0 Four key foundation blocks

3.1 First Key : Open Technology Platform: Scalable, Modular & Independent

- ✓ Scalable: Refresh/New Technology, Newer Courses, Newer locations.
- ✓ Modular: In Courses, Delivery Models, Locations, Technology.
- ✓ Independent: Industry collaboration platform including and beyond Siemens.
- ✓ Technology from Siemens and other companies.

3.2 Second Key: Self learning Interactive modules – DIAS based (Digitally Advanced Interactive System)

- ✓ Learn anywhere-anytime using interactive digital content.
- ✓ Available in vernacular medium.
- ✓ Instructor assistance only for practical handholding.
- ✓ Uniformly and consistency of learning media over pure instructor-led model.
- ✓ Incorporation of global practices.
- ✓ Easy and rapid updates.

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3.3 Third Key : Unique Hub & Spoke Deliver Model

- ✓ Large scale deployment and scale-up possibility with minimum time and investment.
- ✓ Optimum leverage of physical infrastructure.
- ✓ Foundation for adding other courses, collaborators, partners as per the need of AP and India.
- ✓ The spokes (t-SDI) are connected to the hubs (COE) for advanced assistance and advancing lab infrastructure.

3.4 Fourth Key : Industry Relevant, Self Sustaining Platform

- ✓ Industry relevant: New technology additions and refreshes as per industry needs.
- ✓ Self sustaining: Prime funded, operationally sustainable.
- ✓ Built – Operate – Transfer of the complete setup to relevant institutions / bodies post 3 years.
- ✓ Additional 1 year supervisory and subject matter expertise.

4.0 Industry Skill Development Initiative : A partnership between APSSDC & Siemens

4.1 Technical Institutions:

4.1.1 Weak Education System

- ❖ Outdated Engineering Concepts
- ❖ No Vocational experience / interaction
- ❖ Outdated tools in labs
- ❖ Faculty not equipped with industry trends & practices

4.2 Skill Development Initiatives

- ❖ Bridge gap between industry needs and available skills through industry oriented learning.
- ❖ Enable institutes to improve quality of education.
- ❖ Student training on industry skills

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4.3 Industry:

4.3.1 Challenges faced by Industry

- ❖ Large investment in time, effort & money to train students.
- ❖ 6-18 months before recruits become productive.
- ❖ Students attrition post training for better salary packages.
- ❖ Affects competitiveness of companies.

5.0 **Concepts and Design of the Cluster Hub and Spoke Approach**

- 5.1 **"COEs" (Advanced Knowledge Centres)** are focused to skill students for relevant growth industries – Automotive, Aerospace & Defense, Industrial Machines, Shipbuilding – at competent Engineering Colleges / large Polytechnic levels.

A detailed report on Centres of Excellence is attached as Annexure I.

- 5.2 **"t-SDIs" (technical-Skill Development Institutes)** are focused on skilling students in vocational trades – Automotive, Electrician, Electronics, Manufacturing & Fabrication, Agro & Farm machineries – at Polytechnic / ITI level.

- 5.3 **"SDCs" (Skill Development Centres)** are local e-enabled centres that will access digital content available with COEs and t-SDIs to help spread beginner level vocational skills across the state. This can be fuelled by the e-CSC in the state.

A detailed Report on Technical Skill Development Institutes and SDCs is attached as Annexure II.

5.4 **Industry Skill Development Initiative Hierarchy**

White Collar : Universities / Engineering Colleges – COE
 Grey Collar : Engineering Colleges / Polytechnics – t-SDI (Polytechnics)
 Blue Collar : Polytechnics / ITI – t-SDI (Polytechnics/ITI)
 Rust Collar : ITI / Vocational Centres – t-SDI (ITI/Vocational)

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5.5 The Concept

Industry-Academia partnership Model – Drawbacks

<u>Industry</u>	<u>Academia</u>
Large investment in time and effort	Outdated infrastructure
6-18 months gestation period for recruits	Irrelevant Curriculum
Student attrition after training	Lack of Capacity
Non-Standardized vocational education	Affects competitiveness

5.6 Industry-Academia partnership Model – the Siemens Methodology

Producer – Consumer Interactions with academia, continuing education collaboration in research and industry linked learning model are the Siemens Model and methodology.

5.7 “COEs” (Advanced Knowledge Centres)

5.7.1 Interdisciplinary Knowledge Center

- Serve as a Technical Knowledge Resource for Industry.
- Equipped with State-of-the-Art Tools and Technologies.
- Hub for ‘Technical’ Skill Development Programs in State in coordination with Universities and Industry.
- Catalyze Industry – Academia Partnership
- The COEs are fine-tuned as per the requirement of specific industries. COEs can be planned for Automotive, Aerospace & Defense, Industrial Machineries, Energy and Shipbuilding.

5.8 “t-SDIs” (technical-Skill Development Institutes)

t-SDIs support Skill Development Centres to further spread vocational skills & research and higher education students to COEs through Basic Skills of Engineering Drawing and Soft Skills for business and Vocational Skills, __Automotive (2 and 4 wheelers) Electrical (Home and Industrial) Electronics and ICT (Home and Office) Agricultural machineries and Manufacturing, Production and Fabrication.

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6.0 Scope of the initiative: Partnership model and Scope of work

6.1 Creating Enabling Environment

- Centres of Excellence plus Technical Skill Development Institutes
 - 2 years of Operation
 - 1 year of Handholding and Support
- Creation of Board of Governance
- Constituting a joint working group for curriculum review and Industry Interface.

6.2 Skilling Manpower

- Mentoring
- Student Training Program
- Certification Exams
- Computer Based Training Modules as per the list (for self paced learning)

6.3 Key Value proposition

6.3.1 Enabling Institutions

- Establishing Siemens Center of Excellence
- Providing Siemens Software and Hardware for Labs
- Training of Faculty
- Siemens Support
- Promote Innovation and Industry relevant Skills

6.3.2 Industry Interfacing

- Industry Seminars
- Internship Programs
- Industry Projects
- Industry visits
- Co-accreditation
- Co-certification

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6.3.3 Improving Employability

- Student Training
- Continuous Assessment
- Student Contests
- Certification
- In-depth Industry Exposure
- Career Counseling

7.0 Training Delivery framework designed for highest efficiency and effectiveness at COEs & t-SDIs

7.1 Program Management

- Manage life cycle of the project delivery
- Project planning & milestone setting
- Stakeholder management
- Provide innovative solutions

7.2 Resource Management

- Resource planning
- Source quality faculty and project management team
- Provide Orientation, Induction & Train the Trainer
- Payroll & HRMS

7.3 Training Delivery and Feedback

- Training in COE labs
- CBT for training delivery
- Continuous feedback ensures standardize quality

7.4 Assessment and Certification

- State of the Art online assessments for accurate skill measurement
- Recorded practical assessments

7.5 Audit & Quality Control

- Stringent internal 3rd party audits to ensure quality
- Regular faculty and infra audits
- Systems & process for preventive control

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- Escalation matrix for corrective control

7.6 Placement Orientation

- Extended support for post training placement
- Grooming on how to attend interview, Group discussion, Profile and Mock interviews

7.7 Comprehensive & Reporting

- Maintain documents related to student & training
- Share dashboards with leaders
- Daily and Weekly review at CEO level
- Monthly, Quarterly and annual reviews stakeholders

8.0 Project cost: Reference is made to mail dated 10th December 2015 from Siemens. Component-wise projected cost for each of the six clusters of the entire project is as hereunder:-

S.No.	Cost of component	Current price in INR
1	Services	13,31,76,364.00
2	Digital courses including IP of industry partners	249,75,00,000.00
3	Softwares	247,78,24,501.00
4	Hardware (including maintenance)	48,48,52,657.00
	Total	559,33,53,522.00

Copy of valuation summary from M/s Siemens is enclosed at Annexure III.

Attempt has been made to analyze each component of cost after breaking each into sub components, estimating cost of each sub component and thus re-arriving at cost of each component. Comparison has been made between estimated cost and the same is mentioned in valuation summary.

Observations have been put forward thereafter.

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8.1 Services: Following are sub components of "Services" as mentioned in valuation summary

- Staffing at COEs (Centre of Excellence) and t-SDIs (Technical Skill Development Institute)
- Insurance of equipment
- Bi-annual trainers training expenses
- Annual industry partner seminars
- Project management including Centre management
- Assisting APSSDC on course promotion/student mobilization
- Counseling of incoming students
- Grading and Certification

Among the above, staffing at COEs and insurance are sub-components contributing to cost (more than 95%). Detail analysis is made for these two components, for the remaining estimated costs have been projected on acceptable norms.

8.2 Staffing: Projected manpower to man operations for each Cluster is reproduced here below

- 01 Cluster Head
- 05 Centre Heads
- 22 Technical Managers are planned for each cluster
- 06 COE Senior trainers
- 03 COE trainers
- 02 COE assistants
- 08 t-SDI trainers and assistants
- 01 Cluster coordinator
- 05 Subject matter expert

For estimating manpower cost, they are classified into following categories, and per month all inclusive wage is mentioned there against each category. The wages are expected to be enhanced @ 10% for each and thus manpower cost for 3 years has been arrived at.

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Category	Experts	No. per Cluster	All inclusive monthly wage per person	Per Cluster (in Rs.)
01	Cluster head	1	70,000/-	70,000/-
02	Centre head for t-SDI	5	50,000/-	2,50,000/-
03	COE Sr trainer	6	40,000/-	2,40,000/-
04	COE trainer	3	30,000/-	90,000/-
05	COE Assistant -2			
	Cluster coordinator-1	11	20,000/-	2,20,000/-
	t-SDI trainers-8			
06	Project manager	1	30,000/-	30,000/-
07	Subject matter expert One for each trade	5	70,000/-	3,50,000/-
			Sub Total	12,50,000/-

Thus per year wages work out to be Rs.1,50,00,000 (150.00Lakh) considering increase of 10% each year, 3 years wages work out to be as follows.

	1 ST YR	2 ND YR	3 RD YR	TOTAL
WAGE (Rs. in crores)	1.5	1.65	1.815	4.965

Thus for 6 Clusters staffing cost works out to be 6X4.965=Rs.29.79 crores

8.3 Insurance:

The cost of hardware to be provided for all six cluster has been indicated as Rs.48,48,52,657/- (say 48.49 lakhs) considering insurance @ 1% and depreciation at 20%, cost of insurance for 3 years is worked out as shown below:

	1 st yr	2 nd yr	3 rd yr
HW cost (after depreciation) (Rs. in crores)	48.49	38.79	31.03
Insurance charges in crores @ 1% of assets	0.4849	0.3879	0.3103

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8.4 Remaining Services:

8.4.1 Trainers training expenses (bi-annual): In calendar year, number of days trainers would undergo as per projected is 434 days. Considering cost of training for trainer per day as Rs. 3000/- (including TA/DA of trainers), the cost of the sub component works out to be Rs. 13.02 lakh per year and Rs. 39.06 lakh for 3 years.

8.4.2 Annual industry seminars: Considering there will be one such seminar per month and cost of conducting each as Rs. 1.00 lakh, the cost of this sub component works out to be Rs. 12.00 lakhs per year and Rs. 36.00 lakhs for three years.

8.4.3 Project Management including Centre management: This will be carried out by Project Manager, and hence no additional cost is considered.

8.4.4 As Assisting APSSDC on course promotion/students mobilization: This will be carried out by COE head, Project Manager and hence no additional cost is considered.

8.4.5 Counseling of incoming students: This will be carried out by Trade Expert and Cluster coordinator, hence no additional cost is considered.

8.4.6 Grading and Certification: This will be carried out by trainers and hence no additional cost is considered.

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8.5 Cost of Services: This total cost of "Services" component works out to Rs.31.60 crores as shown hereunder. The cost considered is Rs.13,31.76 lakhs. Hence this component cost is acceptable.

(Rs. in crores)

	1 st year	2 nd year	3 rd year
Salaries & Wages	9.0	9.9	10.89
Insurance	0.4849	0.3879	0.3103
Trainers training	0.1302	0.1302	0.1302
Annual Industry Seminars	0.12	0.12	0.12
Total	9.7351	10.4181	11.4503

9.0 Digital courses including IP of industry partners:

Against this category, a sum of Rs. 249,75,00,000.00 is considered. The estimate shown in the report is based on training of 37,000 students per year for 3 years with one student undergoing 3 courses on an average. A course fee of Rs.7,500/- has been considered which is in line with the market price for centres offering similar CAD/CAM/CAE courses. However, since cost for running courses is included in 1st component, i.e. Services, the entire fee of Rs.7,500/- per course per student is considered against neutralizing the cost of preparing course content and IP cost.

Further, during discussions, officers of M/s. Siemens clarified that each course content and curriculum has been prepared by the best in industry which is protected under IP rights. Further, officers of M/s. Siemens also emphasized that the contents and curriculum are one of the best in the world to justify the cost of this component. They further indicated that about 476 courses are offered across COEs and t-SDIs. In view of above, the cost may be accepted.

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10.0 Softwares:

Indicated cost against providing softwares is Rs.247,78,24,501. There are 28 softwares by type, planned for COEs and t-SDIs with 10567 seats. These softwares cater to areas of CAD/CAM/CAE/Automation provide opportunity for engineering/diploma graduates to learn modeling, analysis, simulation. The proposed softwares include advanced versions viz., NXACAD 100, TCU ACAD100, GEOACAD100 etc. Softwares such as Creo, Solid Edge which are proprietary of other components are also included. Based on unit price, 28 types of softwares can be grouped into 3 categories:-

- i) Above Rs. 20.00 lakhs
- ii) Below Rs. 10.00 – 20.00 lakhs
- iii) Below Rs. 5.00 lakh

Average unit price for these categories have been worked out and the considered price (at pro-rata) is also put against here below. Considered price is arrived at multiplying average unit price by a factor 0.6 (24778/41276)

(Rs. in lakhs)			
Category	No. of s/w	Average Unit price	Consider price
1 > Rs.20.00 lakh	7	28.57	22.856
2 > Rs.10.00 lakh < Rs.20.00 lakh	7	15.02	12.01
3 < Rs.05.00 lakh	14	1.947	1.40

Here, 14 software falling in category 03 (i.e. considered unit price Rs.1.40 lakh) are facilitating software. They facilitate intervention by trainer, expert for remote location and guide trainee, in case of any hurdle the later faces. The software falling in category 01 and 02 (total 14) are advanced versions of high-

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end engineering software, proposed to be installed perpetual licenses. Further during discussions in the O/o. Secretary, Dept. of Skill Development, Govt. of A.P. representatives of M/s. Siemens, informed that through they are academic licenses, they are identical with their commercial versions. In view of above, the considered price may be accepted. However, M/s. Siemens may be requested to provide continuous upgradations for these software beyond three years period.

11.0 Hardware:

Hardware cost towards providing necessary hardware for laboratories has been indicated as Rs. 48,48,52,657.00 which includes maintenance charges for three years. There are 8 laboratories in each COE, 13 in t-SDI each laboratories is equipped with CNC machines, hardware equipment, workstations, Cutting tools, tool holders and other miscellaneous items. Substantial amount consumable also will be required for operations and maintenance.

Further, it is observed that most of these items are to be procured from outside. In view of large variety and volume of high, medium and low end items and together with the fact that these are to be procured from outside, the project cost is reasonable.

12.0 Conclusion

There is an immense potential and need for skill development in Andhra Pradesh with increasing manufacturing industries along with associated service providers. The present system of vocational training and skill development faces an expanding gap with outdated engineering concepts, tools and faculty. The vocational training and skill development has to produce industry "fit" personnel which requires industry oriented training, state of the art tools to match industry standards, incorporation of global standards & practices. There is growing

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interest in Internet of Things (IoT), sensors, robots, and smart controls. All these are going to contribute towards the upcoming Industry 4 standards.

Siemens industry skill development program is targeting universities, engineering colleges, polytechnics and Vocational training institutes simultaneously establishing centers of excellence, technical skill development institutes and skill development centers. The proposed labs and machinery indeed address the concerns by providing the state of art, best of the lot technologies, machinery, software, content and training methodologies. The vision of Andhra Pradesh state government is laudable in addressing a challenge with the proposed solution which will help in positioning the state well ahead of others to provide facilities and training opportunities to lakhs of people.

Further as mentioned in Sec. 8, 9, 10 & 11, cost component mentioned against 4 categories viz. i) Services ii) Digital Courses included IP of industry partners iii) Softwares and iv) Hardware including maintenance, is found to be reasonable.

The proposed project may be taken up with full speed to deliver the results by training in industry grade skills in manufacturing, process control, industrial automation etc. a large number of people.

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Annexure I

Siemens Centre of Excellence – Overview

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Annexure-I Page No.1

Siemens Centre of Excellence – Overview

I.0 Activities at Center of Excellence

Knowledge Centre Hub for Industry Interaction	Research & Development Education & Training
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I.0.1 Interdisciplinary Knowledge Center

- Serve as a Technical Knowledge Resource for Industry
- Equipped with State-of-the-Art Tools and Technologies
- Hub for "Technical" Skill Development programs in State in coordination with Universities and Industry
- Catalyze Industry – Academia Partnership

I.0.2

S. no.	Lab
1	Product Design and Validation Lab
2	Advanced Manufacturing Lab
3	Automation Lab
4	Electrical Lab
5	Process Instrumentation Lab
6	Mechatronics Lab
7	Test and Optimization Lab
8	Energy Studies Lab
9	Advance Machine & Robotics lab
10	Automotive Body Repair Lab
11	Automotive Paint Lab
12	Lift Installation and Maintenance Lab

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Annexure-I Page No.2

**I.1 Product Design and Validation Lab – Lab 1
NX for Digital Product Development**

I.1.1 With the industry's broadest suite of integrated, fully associative CAD-CAE-CAM applications, NX touches the full range of development processes in product design, simulation and manufacturing.

**I.2 Advanced Manufacturing Lab – Lab 2
Planning Capabilities**

I.2.1 Process

- BOM Management
- Manufacturing process planning
- Advanced assembly planning
- Global production planning
- Change management

I.2.2 Work Instructions

- Process steps, visuals, text and documents
- Up-to-date information
- Web-based retrieval and mobile device support
- MES integration

I.2.3 Layouts

- Plant/facility design
- Workstation/Line design
- Layout data management
- Material handling, logistics, and indirect labor optimization

I.2.4 Dimensional Quality

- Define dimensional targets based on embedded PMI
- Upfront variation and manufacturability analysis
- Requirements traceability

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Annexure-I Page No.3

**I.3 Advanced Manufacturing Lab – Lab 2
Simulation Capabilities**

I.3.1 Assembly

- Assembly feasibility studies
- Automatic assembly path planning
- 3D kinematic simulation
- Sequencing of operations

I.3.2 Robotics

- Robotic placement and path planning
- Native language programming
- Realistic robot simulation
- Cycle time optimization

I.3.3 Logistics

- Material flow simulation
- Throughput assessment
- Energy usage simulation and analysis
- Genetic algorithms for experimentation and optimization

I.3.4 Human

- Advanced anthropometric scaling
- Advanced posture prediction
- Comprehensive ergonomic analysis
- Lifelike, 3D visualization and virtual reality

**I.4 Advanced Manufacturing Lab – Lab 2
Production Capabilities**

I.4.1 Issue Tracking

- Enterprise visibility
- Standardized procedures
- Proven change and workflow control
- Automated correlation of issues with deliverables

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Annexure-I Page No.4

I.4.2 Virtual Commissioning

- Multi-discipline coordination
- Hardware in the loop
- Managed source of information
- Optimized use of equipment investments

I.4.3 Shop Floor

- Automated generation of work plan
- Rule-based validation
- Visual work instructions
- Validated execution
- Master/Order configuration

I.4.4 Build Quality

- Trending with sophisticated analytics
- Product and process integration
- Advanced historical reporting
- One UI for all measurement results

I.5 Automation Lab – Lab 3

- INDUSTRIAL PLC (Programmable Logical Controller)
- INDUSTRIAL HMI (Human Machine Interface)
- INDUSTRIAL SCADA (Supervisory Control & Distributed Acquisition)
- PLC NETWORKING (Profibus, Profinet, etc.)

**I.6 Electrical Lab – Lab 4
AC/DC DRIVES**

- INDUSTRIAL AC-DC DRIVES (Power Electronics & Controls)
- SINAMIC G-120 (AC Drives Product & Maintenance)
- SINAMICS DC 6RA80 (DC Drives Product / Maintenance)
- DRIVE – PLC NETWORKING (PROFIBUS, PROFINET, etc.)

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**I.7 Electrical Lab – Lab 4
SWITCHGEAR-MOTORS**

- INDUSTRIAL SWITCHGEAR (Products & Maintenance)
- POWER DISTRIBUTION (ACB, PAC & Maintenance)
- POWER QUALITY & MEASUREMENT
- INDUSTRIAL COURSE ON INDUCTION MOTOR (Service/Maintenance)

I.8 Process Instrumentation Lab – Lab 5

I.8.1 PROCESS INSTRUMENTATION

- Temperature
- Flow
- Level
- Pressure
- Sensors/Measurements & Communications

I.9 Mechatronics Lab – Lab 6

- Level-1/2 Courses: 30 Working days each (SPE-Berlin certified)
- Crash Course: 12 days (SITRAIN- India certified)

**I.10 Test & Optimization Lab – Lab 7
Imagine Lab**

**I.10.1 LMS Imagine.Lab
Landing Gear**

Helps design any landing gear system and its multi-disciplinary nature

- Actuation systems
- Braking systems
- Steering systems
- Shock absorber

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**I.10.2 LMS Imagine.Lab
Environmental Control System**

Simulate and analyze complex fluid systems

- Bleed air
- Anti-icing
- Ventilation circuit
- Oxygen and life system

**I.10.3 LMS Imagine.Lab
Engine Equipment**

Design fuel systems and controls as well as engine control actuators

- Fuel systems
- Lubrication
- Heat exchange
- Thrust reversers
- Accessory gearbox

**I.10.4 LMS Imagine.Lab
Power & Distribution Networks**

Size and optimize complete aircraft power and distribution networks

- Hydraulic systems
- Pneumatic systems
- Electrical systems
- Electrical wire harness
- Electrical aircraft

**I.11 Test & Optimization Lab – Lab 7
Virtual Lab**

**I.11.1 LMS Virtual.lab
Motion
Durability**

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Scalable modeling, sizing & analysis of mechanical systems

- Controls
- Actuation systems
- Flexible structures
- Kinematic and dynamic Functional & performance specifications for safety, reliability and stability.

**I.11.2 LMS Virtual.Lab
Acoustics
Noise & Vibration**

Simulation & analysis of system vibro-acoustics

- Accurately predicts aircraft interior and exterior noise & vibration
- Address structural and airborne transmission paths
- Reduce noise of structures, engines, power equipment, ECS
- Optimize passenger comfort

**I.11.3 LMS Virtual.Lab
Correlation & Updating**

De-risk physical structural dynamic testing via virtual testing

- Increase productivity by combining test-based and virtual component models into system-level models.
- Correlate noise & vibration data sets: Test FEM, Test Test, FEM-FEM
- Update FE models with test data systematically

**I.11.4 LMS Virtual.Lab
Optimization**

Multi-disciplinary sensitivity analysis and optimization

- Reach optimal design with multiple performance targets.
- Easily identify key variables that influence the functional multi-attribute performance of a mechanical system.

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**I.12 Test & Optimization Lab – Lab 7
Test Lab**

**I.12.1 LMS Test.Lab
Structures & GVT
Structural Dynamics Testing**

Small scale and large scale modal tests in hours rather than days

- Complete GVT testing for aeroelastic certification
- Identify root causes of vibration problems and engineer the best solution

**I.12.2 LMS Test.Lab
Acoustics & General Dynamic
Data-Acquisition**

Data acquisition and analysis for noise, vibration and other dynamic phenomena

- Cabin comfort
- Interior acoustics
- Fly-over noise
- Advanced aircraft noise & vibration

**I.12.3 LMS Test.Lab
Rotating &
Turbine Testing**

All digital, advanced solution for complex turbine testing processes

- Data acquisition
- Data storage & management
- On-line monitoring alarming
- Analysis and reporting
- Updating

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I.12.4 LMS Test.Lab
Vibration Control &
Environmental Testing

Advanced and complete environmental testing solution range

- Basic component vibration qualification testing
- Advanced 3D multi-shaker vibration control
- Closed loop shaker control and real time monitoring of shakedown tests
- Safe operation

I.13 Energy Studies Lab – Lab 8

- IE3 Series motors – High efficiency motors to serve variety of industrial applications with savings in energy cost.
- VFD Control – Variable voltage variable frequency drive – programmed to achieve the energy savings in closed loop control.
- SIMOCODE – Intelligent motor controller to control motor operations to save energy.
- PAC Meter – Intelligent meter programmed for high – low tariff switching, limit monitoring & logical control of the field devices.

I.14 Advance Machine & Robotics Lab – Lab 9
Machine Controller Lab

I.14.1 DIFFERENT CONTROLLERS:

- 1 SINUMERIC 808D Turning / Milling
- 2 SINUMERIC 840D SL

I.15 Advance Machine & Robotics Lab – Lab 9
CNC Machine Manufacturing Lab

I.15.1 CNC Turning Centre and 3 Axes CNC Vertical Milling Machine with closed loop servo motor control fitted with Industrial Control Panel with further option of linking to CAD/CAM

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**I.16 Advance Machine Robotics Lab – Lab 9
Robotic Manufacturing Lab**

I.16.1 Robotic Pick and Place Cell – Material Handling Application

**I.17 Advance Machine & Robotics Lab – Lab 9
Robotic Manufacturing Lab**

I.17.1 Robotic Arc Welding Cell – Arc Welding Application

**I.18 Advance Machine & Robotics Lab – Lab
Robotic Manufacturing Lab**

I.18.1 Robotic Spot Welding Cell – Spot Welding Application

I.19 Automotive Body Repair Lab – 10

- Occupational Safety & Health
- Hand Tools
- Power Tools
- Systems of Measurement
- Fasteners
- Cutting Tools
- Taps and Dies
- Hand Reamers
- Basic Electrical
- Basic Electronics
- Introduction to Heat Treatment

I.20 Automotive Paint Lab – Lab 11

- Automotive Paint Booth
- Automotive Paint
- Pneumatic Paint Guns

I.20.1 Learning Objective:

- Color Matching
- Preparation
- Equipment
- Safety

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**Report on Valuation of Siemens Project of Skill Development in
Andhra Pradesh**

Annexure-I Page No.11

- Paint Surface Smoothing
- Surface Cleaning
- Painting
- Surface Priming
- Primed Surface Smoothing
- Finish Paint Spray
- Curing

I.21 Lift Installation and Maintenance Lab – Lab 12

- Mechanical Installation of Elevators
- Mechanical Installation of Escalators
- Electrical Elevator mechanic
- Electrical Escalator mechanic
- PLC programming for controllers

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**Report on Valuation of Siemens Project of Skill
Development in Andhra Pradesh**

Annexure II

t-SDI – Technical Skill Development Institute – Overview

An ISO 9001:2008, 14001:2004, 29990:2010, 50001:2011 Certified Institution

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Report on Valuation of Siemens Project of Skill Development in Andhra Pradesh

Annexure-II Page No. 1

t-SDI – Technical Skill Development Institute – Overview

II.0 What are t-SDI

1. "t-SDI" (technical-Skill Development Institutes) are focused on skilling students in vocational trades – Automotive, Electrician, Manufacturing & Fabrication, and Agro & Farm machineries at polytechnic/ITI level.
2. T-SDIs are means to focus on skills for blue collar & rust collar jobs.
3. There will be around 30 Institutes that will be upgraded to TSDIs. Each institute will have a combination of 3 different trades.
4. Each Lab will have an industry partner to give constant updates and feedback on course curriculum and its relevance in the Industry. Ex. For Electrical trade, Schneider will partner with Siemens to look at the course curriculum. Internships and a joint certifications on successful completion of the course is also to be done by the Industry partners.

II.0.1

S.no.	Lab
1	Automotive:2-Wheeler
2	Automotive:4-Wheeler
3	Electrical-Home
4	Electrical-Commercial
5	CAD CAM/Robotics
6	Electronics: Home
7	Electronics: ICT
8	Manufacturing: Production
9	Manufacturing: Fabrication
10	Agriculture

II.1 t-SDI: Automotive Mechanic Lab 1&2

II.1.1 Automotive Trade is subdivided into two different labs

- Two Wheeler Mechanic Lab
- Four Wheeler Mechanic Lab

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Annexure II Page No.2

II.1.2 Basic Infrastructure requirements

- Total of 2800 Sq.ft area is required for both the labs in the automotive trade
- The space should be made available on the ground floor
- Dedicated power requirement of 15 KVA
- Pneumatic Line
- Water Connection

II.1.3 Basic topics Covered

- Repair & Service of Two Wheeler (different systems)
- Specialization in overhauling of two wheeler engines
- Repair Maintenance of four Wheeler (different systems)
- Specialization in overhauling of 4 wheeler engines (Both Petro & Diesel)

II.2 TSDI : Electrical Technician / Electrician: Lab 3 & 4

II.2.1 Electrical Trade is sub divided into 3 Labs

- Electrician Residential/Building & Industrial Lab
- Refrigeration & Air Conditioning Lab
- Lift & Escalator Mechanic Lab (Will be available at COEs only)

II.2.2 Basic Infrastructure Requirements

- Total of 1400 Sq.ft. area is required to setup both Electrician and RAC Lab
- Power requirements for Electrical lab will be 22 KVA (17 KVA for RAC and 5 KVA for Electrician Lab)
- Ideally to be located on the ground floor

II.2.3 Major Topics Covered

1. House Wiring
2. Repair of Home Appliances
3. Repair & Maintenance of DG Sets
4. Maintenance of Transformers
5. Repair & maintenance of Refrigeration & AC

6. Repair and maintenance of Lifts & Escalators

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Annexure-II Page No.3

II.3 TSDI: Electronics Technician Lab 6 & 7

II.3.1 Electronics trade comprises of 2 Labs

- Electronics Home & Office
- Information Communication & technology

II.3.2 Basic Infrastructure Requirements

- Area requirements of 800-1000 Sq.ft
- Dedicated Power requirement of 3~5 KVA

II.3.3 Major topics Coved

- Soldering / De-soldering
- Repair of Home Appliances
- Repair of Office Equipment
- Repair of Mobile & laptop repair

II.4 TSDI: Manufacturing, Fabrication & production Lab 8 & 9

II.4.1 Manufacturing Fabrication & production trade comprises of two Labs

- Welding & fabrication Lab
- Manufacturing & Production Lab

II.4.2 Basic Infrastructure Requirements

- Total area of 3000 Sq.ft (2200 Sq.ft for M&P lab and 800 Sq.ft for Welding & fabrication lab)
- Pneumatic Lining
- Dedicated power of 30 KVA
- Water Connection

II.4.3 Major topics Coved

- Basic Fitting & Sheet metal work
- Gas, Arc, MIG and TEG Welding
- Turning/Milling/Grinding Operations
- CNC Programming for Lathe and Milling

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Annexure II Page No.4

II.5 TSDI: Agriculture & Farm Equipment Lab 10

II.5.1 Agriculture trade comprises of one Labs

- Agriculture & Farm Equipment Lab

II.5.2 Basic Infrastructure Requirements

- Total area of 2400 Sq.ft
- Pneumatic Lining
- Dedicated power of 20 KVA
- Water Connection

II.5.3 Major topics Coved

- Tractor
- Tractor accessories
- Submersible/Borewell Pumps
- Irrigation Mono block pumps



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Volume 1

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1 Bill of Material – Siemens Center of Excellence in Andhra Pradesh

1.1 Product Design and Validation Lab

S. No.	Particulars	Units
1	NX Academic Perpetual License Core+CAD	30
2	NX Academic Perpetual License CAE+CAM	30
3	Teamcenter Unified Academic Perpetual License	30
4	Geolus Academic Perpetual License	30
5	Tecnomatix Manufacturing Acad Perpetual License	30
6	JT Translator Academic Perpetual License	30
7	Femap with NX Nastran: Basic Educational License	30
8	Fibersim Legacy NX Academic Bundle (F)	30
9	Syncrofit for NX Perpetual Academic Bundle	30
10	SDE for NX Perpetual Academic Bundle	30
11	OEV Academic Bundle (VS) Perpetual License	30
12	Teamcenter Community Collaboration Bundle	30
13	JT Open Academic Perpetual License	30
14	Rulestream Rule Author	30
15	Rulestream End User	30
16	Rulestream Occasional User	30

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17	Rulestream Automation for NX	30
18	Rulestream Automation for Solid Edge	30
19	Rulestream Automation for Creo	30
20	Rulestream Automation for Teamcenter	30
21	Rulestream Automation for Visio	30
22	Rulestream Automation for DWG	30
23	Rulestream Batch Job Processing	30
24	Rulestream Web Services	30
25	Teamcenter Deployment	30
26	Rulestream Automation for SolidWorks	30
27	Tecnomatix Robcad Academic Perpetual License	30
28	Workstations (Students +Trainer) with Windows OS	31
29	MS Office	31
30	Oracle/SQL Database	30
31	AutoCAD	30
32	Antivirus	31
33	Server	1

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Workstation Configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

Windows® 7 Professional 64 bit (English)

32GB DDR4 RAM

2 GB graphics Card

1TB HDD

Server Configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

32GB RAM

1TB Hard Disk

16x SATA DVD +/- RW Drive

18.5" Monitor with LED backlight

USB Optical Mouse

USB Entry Business Keyboard

Microsoft® Windows Server(R) 2008x64 R2 SP1 Standard Edition Media, English

Dual LAN port required

AutoCAD configuration:

AutoCAD Architecture 2015 or 2016

MS Office

Antivirus

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1.2 Advanced Manufacturing Lab

S. No.	Particulars	Units
1	NX Academic Perpetual License Core+CAD	30
2	NX Academic Perpetual License CAE+CAM	30
3	Teamcenter Unified Academic Perpetual License	30
4	Geolus Academic Perpetual License	30
5	Tecnomatix Manufacturing Acad Perpetual License	30
6	JT Translator Academic Perpetual License	30
7	Femap with NX Nastran: Basic Educational License	30
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10	SDE for NX Perpetual Academic Bundle	30
11	OEV Academic Bundle (VS) Perpetual License	30
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21	Rulestream Automation for Visio	30
22	Rulestream Automation for DWG	30
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Windows® 7 Professional 64 bit (English)

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2 GB graphics Card

1TB HDD

Server Configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

32GB RAM

1TB Hard Disk

16x SATA DVD +/- RW Drive

18.5" Monitor with LED backlight

USB Optical Mouse

USB Entry Business Keyboard

Microsoft® Windows Server(R) 2008x64 R2 SP1 Standard Edition Media, English

Dual LAN port required

AutoCAD configuration:

AutoCAD Architecture 2015 or 2016

MS Office

Antivirus

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Digital Product Design Suite

List of Software Modules in NX Academic Bundle

S. No.	Particulars
1	NX Mach 3 Progressive Die Design
2	NX Advanced Simulation - Add On
3	NX Knowledge Fusion Author
4	NX Open Toolkits Author
5	NX Open GRIP Author
6	NX Body Design
7	NX General Packaging
8	NX Human Modelling
9	NX Human Modelling Posture Prediction
10	NX Aerospace Sheet Metal
11	NX Weld Assistant
12	NX Electrode Design
13	NX WAVE Control
14	NX Drafting Plus
15	NX Issue Management
16	NX Integration to Geolus
17	HD3D Visual Reporting
18	NX Ship Design

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S. No.	Particulars
19	NX Ship Structure Detail Design
20	NX Ship Structure Manufacturing Prep
21	NX Routing HVAC
22	NX Routing P&ID
23	NX Rules Based Structure Welding
24	NX Ship Drafting
25	NX Routing Cabling
26	NX Routing Base
27	NX Mold Wizard
28	NX Die Structure Design
29	NX Die Engineering
30	NX 5 Axis Machining Add-on
31	NX 3 to 5 Axis Milling Add-on
32	NX Wire EDM Add-on
33	NX 2.5 Axis Milling Add-on
34	NX 3 Axis Milling Add-on
35	NX NC Simulation Add-on
36	NX CAM Teamcenter Client Add-on
37	NX Design Simulation
38	NX Thermal Simulation

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S. No.	Particulars
39	NX Flow Simulation
40	Ansys Environment
41	ABAQUS Environment
42	NX Motion Simulation-RecurDyn
43	NX Advanced Thermal Simulation
44	NX Space Systems Thermal Simulation
45	NX Electronic Systems Cooling Simulation
46	NX Response Simulation
47	NX Laminate Composites
48	NX LS-Dyna Environment
49	NX Motion Control Simulation
50	Mechatronics Concept Designer for NX
51	NX Topology Optimization
52	NX One-Step Formability Analysis
53	NX Greater China Toolkit
54	CAM Express 3 to 5 Axis Milling Add-on
55	NX Nastran Desktop Advanced
56	NX Nastran Desktop Rotor Dynamics
57	NX Nastran Desktop Optimization
58	NX Nastran Desktop Advanced Nonlinear Solver

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S. No.	Particulars
59	NX EPak
60	NX Schematics
61	Progressive Die Wizard Manufacturing Bundle
62	NX Render
63	NX Freeform Shape
64	NX Visualize Shape
65	NX Analyze Shape
66	NX Optimization Wizard
67	NX Turning
68	NX Post Builder
69	NX Post Adv Kinematics Library
70	Machining Wizard Builder
71	NX Fabric Flattener
72	NX Advanced FEM
73	NX Advanced Durability
74	NX Motion Flexible Body
75	NX EasyFill Analysis
76	NX Molded Part Validation
77	NX Routing Piping and Tubing
78	NX Routing Harness

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S. No.	Particulars
79	NX Shape Optimization
80	NX CMM Inspection Programming Add-on

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1.2.1 Digital Product Lifecycle Management

List of Software Modules in Teamcenter Unified Academic Bundle

S. No.	Particulars
1	Teamcenter Author
2	Teamcenter Open (SDK)
3	Multi-Site Collaboration
4	STEP AP 203/214 Translator
5	Visualization Mockup
6	Teamcenter Visualization & Illustration
7	Visualization Quality Producer
8	NX Embedded Client
9	Integration for Mentor Board Station
10	Integration for Cadence Allegro
11	Integration for ClearCase
12	Simulation Author
13	RTT Author & Alignment
14	Process Simulate on Teamcenter Named User
15	Teamcenter Manufacturing Resource Library
16	As-Built Management User
17	Issue Management and CAPA
18	Teamcenter Consumer

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S. No.	Particulars
19	MRO Materials Management
20	MRO Maintenance Planning & Execution
21	Logistics Records Management
22	Logistics Structure Management

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1.2.2 Digital Manufacturing Plant Simulation and Optimization Suite

List of Software Modules in Tecnomatix Manufacturing Academic Bundle

S. No.	Particulars
1	FactoryCAD Floating
2	In Context Editor (ICE) - AutoCAD/FactoryCAD - Node Locked
3	Jack
4	Jack Motion Capture Toolkit
5	Jack Occupant Packaging Toolkit
6	Jack Task Analysis Tool Kit
7	RealNC Float
8	Machine Configurator Advanced Float
9	RealNC Optimization Float
10	Process Designer Concurrent
11	Alternative Planning Concurrent
12	Process Simulate Concurrent
13	Process Simulate Spot Concurrent
14	Robotics Concurrent
15	Commissioning Concurrent
16	Process Simulate Human Concurrent
17	Process Simulate Human Advanced (Jack) Concurrent
18	KUKA KRC OLP Float

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S. No.	Particulars
19	ABB Rapid OLP Float
20	KAWASAKI AS OLP Float
21	Plant Simulation Education Concurrent
22	Plant Simulation Options Pack for EDU. Licenses Concurrent
23	Process Simulate on Teamcenter Float
24	Teamcenter Visualization Mockup
25	Teamcenter Visualization Animation Creation Option
26	RobotExpert
27	KUKA KRC OLP for RobotExpert
28	ABB RAPID OLP FOR RobotExpert
29	FANUC RJ OLP for RobotExpert
30	YASKAWA INFORM OLP for RobotExpert
31	KAWASAKI AS OLP for RobotExpert

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1.2.3 Digital Manufacturing Robotics and Automation Suite

List of Software Modules in Tecnomatix RobCAD Academic Bundle

S. No.	Particulars
1	Robcad Concurrent
2	Robcad Spot Concurrent
3	Arc Concurrent
4	Cut and Seal Concurrent
5	Paint Concurrent
6	Cable Simulation Concurrent
7	Rose Development Kit Concurrent
8	ABB Rapid S4 OLP Package Concurrent
9	ABB Rapid S4 Paint OLP Package Concurrent
10	Fanuc RG2 OLP Package Concurrent
11	Fanuc RJ OLP Package Concurrent
12	FANUC F100iA OLP Float
13	Kawasaki 400PC OLP Package Concurrent
14	Kawasaki AD OLP package Concurrent
15	Kawasaki C-CKE OLP Package Concurrent
16	Kobelco OLP Package Concurrent
17	Kuka OLP Package Concurrent
18	Nachi AP OLP Package Concurrent

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S. No.	Particulars
19	Nachi AR OLP package Concurrent
20	Nachi AW OLP package Concurrent
21	Nachi AX OLP package Concurrent
22	Yaskawa NX OLP Package Concurrent
23	Yaskawa XRC OLP Package Concurrent
24	Robcad Catia V5 Interface Concurrent
25	Robcad Pro Engineer Interface Concurrent
26	Robcad Standard Interfaces Concurrent
27	Process Simulate Continuous Manufacturing Concurrent
28	Catia V5 Interface Concurrent
29	VKRC1/2 (KUKA - VW) OLP Float
30	COMAU PDL OLP Float
31	FANUC RJ OLP Float
32	YASKAWA INFORM OLP Float

Confidential

1.2.4 Digital Simulation and Validation Suite

List of Software Modules in NX Nastran Academic Bundle

S. No.	Particulars
1	NX PCB Exchange
2	NX Nastran Basic
3	NX Nastran Advanced
4	NX Nastran Dynamic Response
5	NX Nastran Aeroelasticity
6	NX Nastran Optimization
7	NX Nastran Super Elements
8	NX Nastran DMAP
9	NX Nastran DMP
10	NX Nastran Rotor Dynamics
11	NX Nastran Advanced Nonlinear Solver

List of Software Modules in FEMAP Academic Bundle

S. No.	Particulars
1	FEMAP Flow Solver (Floating)
2	FEMAP with NX Nastran : Dynamic Response (Floating)
3	FEMAP with NX Nastran : Aeroelasticity (Floating)
4	FEMAP with NX Nastran : Design Optimization (Floating)

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S. No.	Particulars
5	FEMAP with NX Nastran : Superelements (Node Locked)
6	FEMAP with NX Nastran: Super Elements (Floating)
7	FEMAP with NX Nastran : DMAP (Floating)
8	FEMAP with NX Nastran: Advanced Nonlinear Solver (Floating)
9	FEMAP with NX Nastran: Rotor Dynamics (Floating)
10	FEMAP with NX Nastran: Topology Optimization (Floating)

List of Software Modules in Vistagy Academic Bundle

S. No.	Particulars
1	Fibersim for NX Academic Bundle
2	Seat Design Environment for NX Academic Bundle

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1.3 Test & Optimization Lab

S. No.	Particulars	Units
LMS Scadas Hardware - 8 channel Data Acquisition System		
1	LMS SCADAS Mobile 1-slot mainframe	1
2	LMS SCADAS Mobile enhanced 8-channel V/ICP/TEDS input module	1
LMS Test.Lab Academic bundle (50 seats - floating)		
3	TL academic bundle	30
Sensors & Accessories		
4	Triaxial, ICP® accel., 100 mV/g, 1 Hz to 4k Hz, 10 ft mating cable supplied (2x)	2
5	1/2 prepolarized free-field condenser microphone (2x)	2
6	General purpose Modal Analysis impact hammer (1x)	1
7	Low-noise coaxial cable, blue TFE jacket, 20-ft, BNC plug to BNC plug (1x)	1
8	Miniature Shaker Kit, 31 N pk sine force, 13 mm pk-pk stroke, includes 2007E miniature shaker with 2100E21-100 power amplifier, trunnion mounting base and 2110G06 stinger kit. (1x)	1
9	Multi-purpose, ICP® force sensor, 10 lb comp., 10 lb tension, 500 mV/lbv (1x)	1

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10	Low-noise coaxial cable, blue TFE jacket, 20-ft, 10-32 coaxial plug to BNC plug (1x)	1
11	ICP® LaserTach™ Kit, includes LaserTach™ with BNC output, 002T10 BNC (1x) cable, 1140C03 mini-tripod and retro-reflective tape.	1
12	TEST object - Rotor kit for Rotating machinery Analysis and Aircraft scaled model for Modal Testing	2
13	Samtech	30
14	Imagine. Lab	30
15	Virtual Lab	30
16	Workstations (Students + Trainer) with Windows OS	30
17	Laptop for Measurements	1
18	MS Office	30
19	PDF Reader	30
20	Antivirus	30

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Workstation & Laptop configuration:

Workstation Configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

Windows® 7 Professional 64 bit (English)

32GB DDR4 RAM

2 GB graphics Card

1TB HDD

LAPTOP WORKSTATION (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel i5 CPU – 2.53 GHz or better

8GB RAM or better

500 GB HDD or better

NVIDIA Graphics card with 1GB dedicated graphics memory

Ethernet Host Interface

Resolution of 1280x1024 or better

Windows 7 64 bit Professional OS

MS Office

Latest PDF reader

Antivirus

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1.4 Automation Lab

S. No.	Particulars	Units
SIMATIC S7 1200 PLC + HMI		
1	SIMATIC S7-1200 AC/DC/RELAIS or DC/DC/DC & accessories	6
2	SIMATIC Basic Panel KTP 700 for S7-1200 and accessories	1
3	Kit Simulator	1
PLC SIMATIC S7-1500 with HMI		
4	SIMATIC S7 1516-3 PN/DP	1
5	SIMATIC ET 200 SP PN- PROFINET	1
6	SIMATIC Touch Panel KTP700 color with PROFINET/ PROFIBUS, MPI	1
7	Kit Simulator	1
TIA Portal Version 13		
8	SIMATIC TIA portal Step-7 Prof V13	12
9	SIMATIC TIA portal WinCC V13	6
10	Workstations (Students + Trainer) with Windows OS	12
11	MS Office	12
12	Antivirus	12

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Workstations configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

Windows® 7 Professional 64 bit (English)

32GB DDR4 RAM

2 GB graphics Card

1TB HDD

MS Office

Antivirus

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1.5 Electrical & Energy Efficiency Lab

S. No.	Particulars	Units
	SINAMICS G 120 with Induction Motor (5 kits)	
1	SINAMICS G120 standard drive 3AC 400V-Network-Content	5
2	Low Voltage Squirrel Cage Motor IP55 Type 1LA0	5
3	Kit simulator	5
	DC Drive 6RA80 with Motor	
4	Sinamics DC Master 6RA80	2
5	DC motor form Siemens approved vendor	2
6	Simulation training kit 6RA80	2
	Electrical Training Set-up - LV Switchgear & LV-AC Motors	
7	Air Circuit Breaker 3WL	1
8	Air Circuit Breaker 3WT	1
9	Molded case circuit breaker 3VT	2
10	Molded case circuit breaker 3VL	1
11	63 A SD	1
12	125 A HRC Fuse (DIN)	3
13	MPCB	3
14	MPCB	3

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15	MPCB	3
16	Bimetallic OLR	1
17	Bimetallic OLR	1
18	Microprocessor based OLR	1
19	Microprocessor based OLR	1
20	Microprocessor based OLR	1
21	Soft starter	1
22	Soft starter	1
23	Soft starter	1
24	MCB 3P	3
25	MCB 2P	3
26	RCBO	4
27	S-D Starter Assembly	3
28	RLT Contactor	2
29	RDOL	3
30	3 phase electrical motor	3
31	Accessories for motor	3
32	SIMOCODE (Intelligent Motor Management System Kit)	2
33	PAC Meter	6

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34	Energy Savings Training Kit	3
35	Workstations (Students + Trainer) with Windows OS	8
36	MS Office	8
37	Antivirus	8

Workstations configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel Xeon Processor E3-1225 v3, Quad Core, 3.20 GHz

16GB RAM (2x8GB) 1600MHz DDR3 Non-ECC

500GB 3.5inch SATA (7,200 Rpm) Hard Disk

18.5" HD Monitor with LED

16x DVD +/- RW Drive

1 GB NVIDIA Quadro K600 – Graphics Card

USB Optical Mouse

USB Entry Business Keyboard

Windows® 7 Ultimate 64 bit (English)

MS Office

Antivirus

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1.6 Process Instrumentation Lab

S. No.	Particulars	Units
	SIMATIC PCS 7	
1	PCS 7 Trainer Package	1
2	SIMATIC PCS 7 - Automation System 410 Smart	2
3	Kit Simulator	2
4	Process Instruments for PI Lab	1 Set
5	Workstations (Students + Trainer) with Windows OS	7
6	MS Office	7
7	Main Filter Regulator & Lubricator (FRL unit , 8 bar , 8mm line size)	1
8	Compressor – Common with the CNC Machine compressor	1
9	Antivirus	7

Workstations configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

Windows® 7 Professional 64 bit (English)

32GB DDR4 RAM

2 GB graphics Card

1TB HDD

MS Office

Antivirus

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1.7 Mechatronics Lab

S. No.	Particulars	Units
1	MMS (Mechatronics Modular System) consisting of : Feeder Station Inspection Station Buffer Station Processing Station Sorting Station Silent Compressor Tool kit SIMATIC S7-1200 PLC with Analogue Input TIA Portal Simatic Manager Version-13 (basic) License	1 Set
2	4 Work Benches (with Tool Box, Compressor) with S7-1200 PLC and TIA Portal Simatic Manager Version-13 (basic) License	
3	Workstations (Students + Trainer) with Windows OS	7
4	MS Office	7
5	Antivirus	7

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Workstations configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

Windows® 7 Professional 64 bit (English)

32GB DDR4 RAM

2 GB graphics Card

1TB HDD

MS Office

Antivirus

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1.8 Advanced Machine and Robotics Lab

1.8.1 CNC Programming

S. No.	Particulars	Units
	808 D	
1	Turning Kit	2
	808D	
2	Milling Kit	2
	840 DSL	
3	Complete Kit with Motor & Drive	1
	Sinutrain 18 licenses	
4	SINUTRAIN COMPLETE PACKAGE SINUMERIK 828D/828D BASIC SW 2.7 SP2/4.4 SP2 SINUMERIK 840D SL CNC-SW 2.7 SP2/4.4 SP2 TRAININGS-SW ON DVD SINUTRAIN FOR SINUMERIK OPERATE SHOPMILL/SHOPTURN FOR PC SOFTWARE 4.4 ED.2 MULTICHANNEL AND OTHER TECHNOLOGYS 16 LICENSES 6 LANGUAGES WINDOWS 7 32/64 BIT WINDOWS XP SP3 32BIT CLASSROOM LICENSE	1

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5	Workstations (Students + Trainer) with Windows OS – To be finalized	19
6	MS Office	19
7	Antivirus	19
8	Stabilizer & Isolation Transformer – 10 KVA	1

Workstations configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® Quad Core (E5-1620, E5-1607, E5-1603)

Windows® 7 Professional 64 bit (English)

32GB DDR4 RAM

2 GB graphics Card

1TB HDD

MS Office

Antivirus

Confidential

1.8.2 CNC Machines

S. No.	Particulars	Units
1	JV 55 Vertical Machining Centre -Voltage Stabilizer -Siemens 828D CNC System Cutting tools and Inserts	1
2	Dia 50 Face mill cutter	1 No
3	Inserts	10 Nos
4	BT 40 Face mill adaptor	1 No
5	BT 40 Collet chuck holder	2 nos
6	ER Collets range 3 -20 mm, in steps of 1 mm(18 nos)	1 No
7	M8 X1.25 HSS Tap	2 Nos
8	12mm Solid carbide end mill	2 Nos
9	6.8mm Solid carbide drill	2 Nos
10	Smarturn CNC Lathe -165mm x 3 Jaw Hollow Chuck and Hollow Cylinder with one set of hard and soft jaws -Voltage Stabilizer -Siemens 828D CNC System	1

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Cutting Tools and Inserts		
11	Turning tool	1 No
12	Inserts	10 Nos
13	Threading Tool	1 No
14	Inserts	10 Nos
15	Boring Tool	1 No
16	Inserts	10 Nos
17	Dia 20 mm insert type drill	1 No
18	Inserts	10 Nos
19	Compressor (8 bar pressure, 200 lpm flowrate with Main FRL unit for 8 bar, 8mm line size)	1

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1.8.3 Rapid Prototyping

S. No.	Particulars	Units
1	Rapid Prototyping Machine - Stratasys	1
2	Workstation with Windows OS	1
3	MS office	1
4	Antivirus	1
5	Support Removal Tank	1
6	De-humidifier	1

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1.8.4 Robotics

S. No.	Particulars	Units
	Spot Welding Robot Cell (Preferred Brands: Kuka, ABB)	
1	Robot (235Kg Payload/2650mm reach)	1 no
2	ARM Welders Make Pneumatic Operated Spot Welding Gun ,Transformer & related Accessories	1 set
3	Pedestal for Robot	1 no
4	Spot Welding Fixture with Indexer	1no
5	Cable tray	1 set
6	Electrical panel and accessories	1 set
7	Pneumatic accessories	1 set
8	Safety Fence	1 set
9	Installation and Programming support	1 set
10	Documentation	1 set
11	Warranty(1 year)	1 set
12	Spot welding machine consumables	1 set
13	MS Sheet 350mmX400mm , 2mm thick	100 nos
	Arc Welding Robot Cell (Preferred Brands: Kuka, ABB)	
14	Robot (4kg payload/150mm reach)	1 no

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1.8.4 Robotics

S. No.	Particulars	Units
	Spot Welding Robot Cell (Preferred Brands: Kuka, ABB)	
1	Robot (235Kg Payload/2650mm reach)	1 no
2	ARM Welders Make Pneumatic Operated Spot Welding Gun ,Transformer & related Accessories	1 set
3	Pedestal for Robot	1 no
4	Spot Welding Fixture with Indexer	1no
5	Cable tray	1 set
6	Electrical panel and accessories	1 set
7	Pneumatic accessories	1 set
8	Safety Fence	1 set
9	Installation and Programming support	1 set
10	Documentation	1 set
11	Warranty(1 year)	1 set
12	Spot welding machine consumables	1 set
13	MS Sheet 350mmX400mm , 2mm thick	100 nos
	Arc Welding Robot Cell (Preferred Brands: Kuka, ABB)	
14	Robot (4kg payload/150mm reach)	1 no

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15	MIG/MAG welding machine and accessories	1 set
16	Welding Fixture table	1 no
17	Gas regulators	1 set
18	Wire spool	1 set
19	Cable tray	1 set
20	Electrical panel and accessories	1 set
21	Pneumatic accessories	1 set
22	Safety Fence	1 set
23	Installation and Programming support	1 set
24	Documentation	1 set
25	Warranty (1 year)	1 set
26	Welding machine consumables	1 set
27	MS Sheet 350mmX400mm , 2mm thick	100 nos
Material Handling Cell (Preferred Brands: Kuka, ABB)		
28	Robot (12kg Payload/ 1850mm reach)	1 no
29	Pedestal for Robot	1 set
30	Air Operated 2 Jaw Gripper	1 no
31	Multi colour Pen Stand, Board & Holders	1 set
32	Cable tray	1 set

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15	MIG/MAG welding machine and accessories	1 set
16	Welding Fixture table	1 no
17	Gas regulators	1 set
18	Wire spool	1 set
19	Cable tray	1 set
20	Electrical panel and accessories	1 set
21	Pneumatic accessories	1 set
22	Safety Fence	1 set
23	Installation and Programming support	1 set
24	Documentation	1 set
25	Warranty (1 year)	1 set
26	Welding machine consumables	1 set
27	MS Sheet 350mmX400mm , 2mm thick	100 nos
Material Handling Cell (Preferred Brands: Kuka, ABB)		
28	Robot (12kg Payload/ 1850mm reach)	1 no
29	Pedestal for Robot	1 set
30	Air Operated 2 Jaw Gripper	1 no
31	Multi colour Pen Stand, Board & Holders	1 set
32	Cable tray	1 set

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33	Electrical Panel & accessories	1 set
34	Pneumatic Accessories	1 set
35	Safety Fence	1 set
36	Installation and Programming support	1 set
37	Documentation	1 set
38	Warranty (1 year)	1 set
39	Air compressor (320 ltrs, 5HP, 12Kg Pressure with installation and commissioning	1 no
40	Supply of Voltage Stabilizer 7.5KVA	3 nos
41	Air Dryer suitable to the above cell	1 no

1.9 Other Items

One 3D Projector Per Centre of Excellence

Total 6

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1.10 T-SDI Lab 1- 4 Wheeler Body Repair

Sl No	Description
1	Pneumatic Dent Puller
2	Spot Welder with accessories
3	MIG MAG Welder
4	Body repair hand tools - Various hammers, dollies, spoons, Set of 16 PCS
5	Bonded auto glass removal & replacement tools
6	Caulking/ panel seam sealer/ panel adhesive application gun
7	Power hacksaw kit AT192
8	Random /dual action orbital sander (12-15cm) AT406
9	Electrician Screw Driver 250mm 826I
10	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)862,864
11	Screw driver 20cm.X 8mm. Blade 827I
12	Screw driver 30 cm. X 8 mm. Blade 829I
13	Hammer Mallet Wooden
14	Hollow Punch set of seven pieces NO 4 to No 20
15	Spanner T. flocks for screwing up and up-screwing inaccessible 8-14MM

1.11 T-SDI Lab 1- 4 Wheeler Paint shop

SI No	Description
1	Allen Key set of 12 pieces (2mm to 14mm)
2	Electrician Screw Driver 250mm
3	Philips Screw Driver set of 5 pieces (100 mm to 300 mm) 62-257,260,263,265,266
4	Pliers combination 20 cm. 70-461
5	Screw driver 20cm.X 8mm. Blade 62-253
6	Screw driver 30 cm. X 8 mm. Blade 62-255
7	Spanners socket with T-bar, ratchet and universal upto 32 mm set of 24 pieces with box
8	Allen Key set of 12 pieces (2mm to 14mm)
9	Feeler gauge 25 blades (metric)
10	Granite surface plate 1600 x 1000 with stand and cover
11	Hammer Ball Peen 0.75 Kg 450 Grms
12	Hammer Plastic 35MM
13	Hand operated crimping tool (i) for crimping up to 4mm and (ii) for crimping up to 10mm
14	Philips Screw Driver set of 5 pieces (100 mm to 300 mm) 62-257,260,263,265,266

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15	Spanner T. flocks for screwing up and up-screwing inaccessible, 8,10,12,13,14,	
16	Spanners socket with T-bar, ratchet and universal upto 32 mm set of 24 pieces with box	
17	Stud extractor set of 5 Nos	
18	Paint Stand	
19	Paint Gun - base coat	
20	Paint Gun - top coat	

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1.12 T-SDI Lab 1- 4 Lift

	Item No	Description	Qty.
Equipment	1	Dumb Waiter Lift 100 Kgs	1
	2	Non-Working Dumb Waiter lift 100 Kgs	1
	3	Electrical Working simulator of a lift	1
General Tools	4	Steel tape 15 m length	1 set
	5	Plier insulated 150 mm	1 set
	6	Plier side cutting 150 mm	1 set
	7	Screw driver 100 mm	1 set
	8	Screw driver 150 mm	1 set
	9	Electrician connector screw driver insulated handle thin stem 100 mm	1 set
	10	Heavy duty screw driver 200 mm	1 set
	11	Electrician screw driver insulated handle thin stem 250 mm	1 set
	12	Punch centre 150 mm x 9 mm	1 set
	13	Knife double bladed electrician	1 set
	14	Neon tester	1 set
	15	Steel rule 300 mm	1 set

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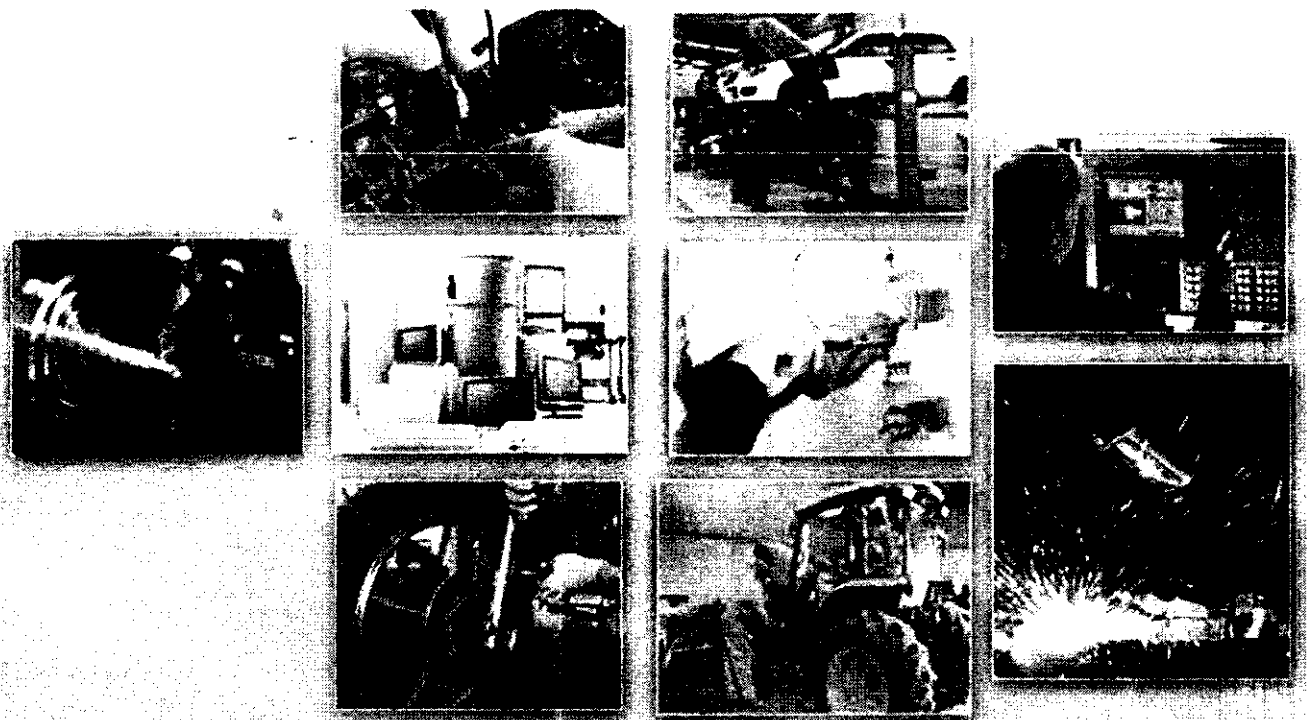
	16	Hammer cross peen with handle	1 set
	17	Hammer ball peen with handle	1 set
	18	Gimlet 6 mm	1 set
	19	Bradawl	1 set
	20	Scriber (Knurled centre position)	1 set
	21	Pincer 150 mm	1 set
Lab specific	22	Pillar electric drill machine 12 mm capacity	1 set
	23	Allen key	1 set
	24	oil can 0.12 ltr	1 set
	25	Grease gun	1 set
	26	Outside micrometer	1 set
	27	Crimping tool	1 set
	28	Wire stripper 20 cm	1 set
	29	Chisel cold flat 12 mm	1 set
	30	Mallet hard wood 0.50 kg	1 set
	31	Hammer extractor type 0.40 kg	1 set
	32	Hacksaw frame 200 mm 300 mm adjustable	1 set
	33	Try square 150 mm blade	1 set
	34	Outside and inside driver caliper	1 set
	Tools	35	Pliers flat nose 150 mm

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36	Pliers round nose 100 mm	1 set
37	Tweezers 100 mm	1 set
38	Snip straight and bent 150 mm	1 set
39	D.E. metric spanner	1 set
40	Drill hand brace	1 set
41	Drill S.S. twist block 2 mm 5 mm 6 mm set of 3	1 set
42	Plane smoothing cutters 50 mm	1 set
43	Gauge wire imperial	1 set
44	File flat 200 mm 2nd cut	1 set
45	File half round 200 mm 2nd cut	1 set
46	File round 200 mm 2nd cut	1 set
47	File flat 150 mm rough	1 set
48	File flat 250 mm bastard	1 set
49	File flat 250 mm smooth	1 set
50	File rasp half round 200 mm bastard	1 set
51	Industrial safety hat	1 set
52	Industrial safety shoe	1 set
53	Elevator rope cutter up to 32 mm	1 set
54	Elevator limit switches	1 set
55	Electric hand blower - 750W, 240V	1 set

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	56	Rail alignment gauge	1 set
Ancillary	57	Virtual GI Shaft for movement of the lift to be constructed	2 set



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Volume 2

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2 E-SDI Labs

2.1 2 Wheeler Mechanic

	Item No	Description	Qty.
Equipment	1	Bike	1
	2	Bike/ Scooter	1
	3	Live Engine	2
	4	Special Tools for the engine	2
General Tools Set	5	Allen key set of 12 pieces.(2mm to 14 mm)	1 set
	6	Caliper inside 15 cm spring	1 set
	7	Caliper outside 15 cm spring	1 set
	8	Center punch 10 mm. Dia. X 100 mm.	1 set
	9	Dividers 15 cm spring	1 set
	10	Electrical Screw drivers 250 mm	1 set
	11	Hammer ball pen 0.5 kg with handle	1 set
	12	Hands file 20 cm. Second cut flat	1 set
	13	Philips screw drivers set of 5 pieces (100 mm to 300 mm)	1 set
	14	Pliers combination 20 cm.	1 set
	15	Screw drivers 20 cm X 9 mm Blade	1 set

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	16	Screw drivers 30 cm X 9 mm Blade	1 set
	17	Scriber 15 cm	1 set
	18	Spanner D.E set of 12 pieces (6mm to 32 mm)	1 set
	19	Spanner, ring set of 12 metric sizes 6 to 32 mm.	1 set
	20	Spanner socket with speed handle, T-bar, ratchet and universal up to 32 mm set of 28 pieces with box	1 set
	21	Steel rule 30 cm inch and metric	1 set
	22	Steel tool box with lock and key (folding type) 400X200X150mm	1 set
	23	Wire cutter stripper	1 set
Lab specific tools & infra	24	Hydroelectric Scissor Lift With S.S. Checkered Top With Inbuilt Cylinder & Provision For Qrc-2 Nos. & Locks	2
	25	Front Wheel Locking Vice	2
	26	Hydraulic Power Pack With 1/2 HP Motor With Manual Pump Attached.(3phase)	1
	27	Poly Hydro Hand Lever Valves To Operate Power Pack	2

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28	Hydraulic Accessories :- Tubing, Fittings, Hose Pipes, Clamps, etc.	2
29	Pneumatic Hanger (Roof / Wall Mounted)	2
30	Hose Reel (Pu Tube Id 8 Od 12 & Length 5Mtr.)	2
31	Hose Reel Cover With Logo	2
32	Impact Wrench (I.R. Make/SNAP ON)	3
33	Socket & Bits Set For Impact Wrench	3
34	Filter Regulator	3
35	Quick Release Coupler (Qrc)	6
36	P.U. Coiled Hose With Blow Gun	3
37	Pneumatic Line From Air Compressor To All Equipment	3
38	Part Rack	2
39	Cbu Tools Trolley	2
40	Insert For Cbu Trolley	8
41	Chain Cum Filter Cleaner Made Of S.S.	1
42	Engine Work Station	0
43	Spark Plug Cleaner & Tester	1
44	Tyre Pressure Gauge analog	1

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	45	Special Service Tool Board	1
	46	Exhaust Blower	1
	47	Work Table With Aluminum Checkered Sheet On Top & Inside	1
	48	Smokeless System Per Lift Set	2
	49	Engine Jig	1
Cut Sections		MODEL OF CUT SECTIONED ENGINE ASSEMBLY WITH CLUTCH AND GEAR Box (Working)	1
		DEMONSTRATION BOARD OF IGNITION SYSTEM (Working)	1
		MOCK LAYOUT OF A TWO WHEELER WIRING (ELECTRICAL SYSTEM) (Working)	1
Ancillary Items		Pneumatic Line From Air Compressor To All Equipment	1
		Air Compressors	1

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2.2 Four Wheeler Mechanic

S. No.	Particulars
1	Wheel Aligner 3D
2	Wheel Balancer
3	Tyre Changer
4	Paint Booth
5	Two Post Lift
6	Multi Scan hand tool
7	Arbor press hand operated 2 ton capacity
8	Grinding machine (general purpose) D.E. pedestal with 300 mm dia wheels rough and smooth
9	Hand operated Hydraulic press 20 Ton
10	Hydraulic jack HI-LIFT type -3 ton capacity,
11	Hydraulic jack HI-LIFT type 5 Ton capacity
12	Pipe Bending Machine (Hydraulic type) 12mm to 50mm
13	Pneumatic rivet gun CP9883
14	Car Jet washer with standard accessories HRK PRO
15	Chain Pulley Block-3 ton capacity with tripod stand
16	Work bench 8' X3'X3' With Rubber Mat
17	Bench Vice 150MM Jaw

Confidential

18	TOOLS TROLLY 7 Drawers Red Colour
19	PART RACK 6*5*2 FT - SEN5944030K
20	Ultrasonic Injection cleaning equipment KEN5038640K
21	Allen Key set of 12 pieces (1.5mm to 14mm)
22	Caliper inside 15 cm Spring
23	Calipers outside 15 cm spring
24	Center Punch 10 mm. Dia. x 100 mm.
25	Dividers 15 cm Spring
26	Electrician Screw Driver 250mm 826I
27	Hammer ball peen 0.5 kg with handle
28	Hands file 20 cm. Second cut flat
29	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)860,861,862,863,864
30	Pliers combination 20 cm.
31	Screw driver 20cm.X 10mm. Blade 927
32	Screw driver 30 cm. X 10 mm. Blade 929
33	Scriber 15 cm
34	Spanner D.E. set of 12 pieces (6mm to 32mm)
35	Spanner, ring set of 12 metric sizes 6 to 32 mm.
36	Spanners socket with speed handle, T-bar, ratchet and universal upto 32

Confidential

	High rate discharge tester (cell tester)	1
	Hollow Punch Set Of Seven Pieces 6mm to 15mm	2 Set each
	Hydraulic jack HI-LIFT type -3 ton capacity	1
	Multimeter digital	5
	Oil can 0.5/0.25 liter capacity	2
	Oil pump dismantling and assembling	2
	Oil stone 15X5X2.5 cm	1
	Oscilloscope 20MHz	1
	Outside micrometer 0 to 25 mm	4
	Outside micrometer 25 to 50 mm	4
	Outside micrometer 50 to 75 mm	1
	Outside micrometer 75 to 100 mm	1
	Pat melting	2
	Phlips Screw Drivers set of 5 pieces (100 mm to 300 mm)	2 Set
	Pipe cutting tool	2
	Pipe flaring tool	2
	Spl tools for John Deere Tractor	1 set
Ancillary	Compressor 5 Bar	1

Confidential

18	TOOLS TROLLY 7 Drawers Red Colour
19	PART RACK 6*5*2 FT - SEN5944030K
20	Ultrasonic Injection cleaning equipment KEN5038640K
21	Allen Key set of 12 pieces (1.5mm to 14mm)
22	Caliper inside 15 cm Spring
23	Calipers outside 15 cm spring
24	Center Punch 10 mm. Dia. x 100 mm.
25	Dividers 15 cm Spring
26	Electrician Screw Driver 250mm 826I
27	Hammer ball peen 0.5 kg with handle
28	Hands file 20 cm. Second cut flat
29	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)860,861,862,863,864
30	Pliers combination 20 cm.
31	Screw driver 20cm.X 10mm. Blade 927
32	Screw driver 30 cm. X 10 mm. Blade 929
33	Scriber 15 cm
34	Spanner D.E. set of 12 pieces (6mm to 32mm)
35	Spanner, ring set of 12 metric sizes 6 to 32 mm.
36	Spanners socket with speed handle, T-bar, ratchet and universal upto 32

Confidential

	High rate discharge tester (cell tester)	1
	Hollow Punch Set Of Seven Pieces 6mm to 15mm	2 Set each
	Hydraulic jack HI-LIFT type -3 ton capacity	1
	Multimeter digital	5
	Oil can 0.5/0.25 liter capacity	2
	Oil pump dismantling and assembling	2
	Oil stone 15X5X2.5 cm	1
	Oscilloscope 20MHz	1
	Outside micrometer 0 to 25 mm	4
	Outside micrometer 25 to 50 mm	4
	Outside micrometer 50 to 75 mm	1
	Outside micrometer 75 to 100 mm	1
	Pat melting	2
	Phlips Screw Drivers set of 5 pieces (100 mm to 300 mm)	2 Set
	Pipe cutting tool	2
	Pipe flaring tool	2
	Spl tools for John Deere Tractor	1 set
Ancillary	Compressor 5 Bar	1

Confidential

18	TOOLS TROLLY 7 Drawers Red Colour
19	PART RACK 6*5*2 FT - SEN5944030K
20	Ultrasonic Injection cleaning equipment KEN5038640K
21	Allen Key set of 12 pieces (1.5mm to 14mm)
22	Caliper inside 15 cm Spring
23	Calipers outside 15 cm spring
24	Center Punch 10 mm. Dia. x 100 mm.
25	Dividers 15 cm Spring
26	Electrician Screw Driver 250mm 826I
27	Hammer ball peen 0.5 kg with handle
28	Hands file 20 cm. Second cut flat
29	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)860,861,862,863,864
30	Pliers combination 20 cm.
31	Screw driver 20cm.X 10mm. Blade 927
32	Screw driver 30 cm. X 10 mm. Blade 929
33	Scriber 15 cm
34	Spanner D.E. set of 12 pieces (6mm to 32mm)
35	Spanner, ring set of 12 metric sizes 6 to 32 mm.
36	Spanners socket with speed handle, T-bar, ratchet and universal upto 32

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	mm set of 28 pieces with box
37	Steel rule 30 cm inch and metric
38	Steel tool box with lock and key (folding type) 400x200x150 mm
39	Wire cutter and stripper
40	A/C COMP CLUTCH REMOVER KIT JTC1609
41	Adjustable spanner (pipe wrench 350 mm)
42	Air blow gun with 10 Meters Hose & Coupling
43	Air impact wrench 1/2" AT650 with 10 Meters Coiled Hose & 10 To 24MM Impact Socket & 125MM Extension Rod.
44	Air ratchet (Note: Accessories With Impact Wrench are suitable, so not included accessories.)
45	Allen Key set of 12 pieces (1.5mm to 14mm)
46	Anvil 50 Kgs
47	Battery –charger 72V, 6Amps
48	Caliper inside 15 cm Spring
49	Calipers outside 15 cm spring
50	Chisel 10 cm flat
51	Chisels cross cut 200 mm X 6mm
52	Circlip pliers Expanding and contracting type 15cm and 20cm each
53	Clamps C 100mm

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54	Clamps C 150mm
55	Clamps C 200mm
56	Coil spring compressor for suspension spring
57	Depth micrometer 0-25mm
58	Dial gauge type 1 Gr. A (complete with clamping devices magnetic stand)and with
59	Dividers 15 cm Spring
60	Drill twist 1.5 mm to 12 mm (various sizes) by 0.5 mm SHR0258500K
61	Electric Soldering Iron 230 V 60 watts 230 V 25 watts
62	Electric testing screw driver
63	Feeler gauge 26 blades (metric)
64	File flat 20 cm bastard
65	File, half round 20 cm second cut
66	File, Square 20 cm second cut
67	File, Square 30 cm round
68	File, triangular 15 cm second cut
69	Files assorted sizes 200 & 250MM Rough & second Cut Set of 21 Nos
70	Flat File 25 cm second cut
71	Flat File 35 cm bastard
72	Garage stand (Vehicle stand 3 Ton)

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73	Gloves for Welding (Leather and Asbestos)
74	Glow plug tester
75	surface plate 600X600MM Cast Iron
76	Grease Gun
77	Grease Gun heavy duty trolley type 10 kg capacity
78	Growler
79	Hacksaw frame adjustable 20-30 cm
80	Hammer Ball Peen 0.75 Kg
81	Hammer Chipping 0.25 Kg
82	Hammer Mallet Wooden
83	Hammer Plastic 40MM
84	Hand operated crimping tool 0.5 to 16MM
85	Hand reamers adjustable 3/8 to 21X32 Set of 6 Nos
86	Hand vice – 75 mm
87	Hollow Punch set of seven pieces NO4 to No 20
88	Impact screw driver With 8 Bits
89	Insulated Screw driver 20 cm x 8mm blade 827I
90	Insulated Screw driver 30 cm x 8mm blade 829I
91	Lifting jack screw type 3 ton, 5ton & 20 Ton capacity
92	Multimeter digital

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93	Oil can 0.5/0.25 liter capacity
94	Outside micrometer 0 to 25 mm
95	Outside micrometer 25 to 50 mm
96	Outside micrometer 50 to 75 mm
97	Outside micrometer 75 to 100 mm
98	Petrol nozzle
99	Philips Screw Driver set of 5 pieces (100 mm to 300 mm)860,861,862,863,864
100	Pipe cutting tool
101	Piston ring compressor
102	Piston Ring expander and remover.
103	Pliers combination 20 cm.
104	Pliers flat nose 15 cm
105	Pliers round nose 15 cm
106	Pliers side cutting 15 cm
107	Portable electric drill Machine 10MM
108	Scraper flat 25 cm
109	Scraper half round 25 cm
110	Scraper Triangular 25 cm
111	Scriber 15 cm

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112	Scriber with scribing black universal
113	Spanner D.E. set of 12 pieces (6mm to 32mm)
114	Spanner T. flocks for screwing up and up-screwing inaccessible 8 -14MM
115	Spanner, adjustable 15cm.
116	Spanner, ring set of 12 metric sizes 6 to 32 mm.
117	Spanners socket with speed handle, T-bar, ratchet and universal upto 32 mm set of 28 pieces with box
118	Spark plug spanner 14mm x 18mm x Size
119	Steel measuring tape 10 meter in a case
120	Steel rule 15 cm inch and metric
121	Steel rule 30 cm inch and metric
122	Straight edge gauge 2 ft.
123	Stud extractor set of 4 Nos
124	Stud remover with socket handle
125	Surface gauge with dial test indicator plunger type i.e. 0.01 mm
126	Taps and Dies complete sets BSF 1/4" To3/4"
127	Taps and wrenches - metric 6-24
128	Telescope gauge
129	Temperature gauge with sensor 0-100 deg c
130	Timing lighter

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131	Toe-in, toe-out gauge
132	Torque wrenches 5-35 Nm, 12-68 Nm & 50-225 Nm
133	Tubeless tyre repair kit
134	Tyre pressure gauge with holding nipple
135	Universal puller for removing pulleys, bearings
136	V' Block 75 x 38 mm pair with Clamps
137	Valve spring compressor universal.
138	Vernier caliper 0-300 mm with least count 0.02mm
139	Vice grip pliers
140	Air Compressors CPM5D With Dryer
141	Pneumatic line air compressor to all equipment in M S Seamless accessories such as ball valves extra

Confidential

2.3 Manufacturing & Production

S. No.	Particulars	Units
1	JV 55 Vertical Machining Centre Along with Voltage Stabilizer Along with Siemens 828D CNC System Cutting tools and Inserts	1
2	Dia 50 mm Face mill cutter	1
3	Inserts	10
4	BT 40 Face mill adaptor	1
5	BT 40 Collet chuck holder	2
6	ER Collets range 3 -20 mm, in steps of 1 mm(18 nos)	1
7	M8 X1.25 HSS Tap	2
8	12mm Solid carbide end mill	2
9	6.8mm Solid carbide drill	2
10	Smarturn CNC Lathe Along with 165mm x 3 Jaw Hollow Chuck and Hollow Cylinder with one set of hard and soft jaws Along with Voltage Stabilizer Along with Siemens 828D CNC System Cutting Tools and Inserts	1
11	Turning tool	1
12	Inserts	10
13	Threading Tool	1
14	Inserts	10
15	Boring Tool	1
16	Inserts	10
17	Dia 20 mm insert type drill	1
18	Inserts	10
19	Compressor (Along with FRL unit)	1

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2.4 Welding

	Item No	Description	Qty.
Equipment	1	Oxy Acetylene Gas welding	1
	2	Gas Cutting Machine	1
	3	MIG/MAG Welding Machine	2
	4	TIG/ GTAW Welding Machine	2
	5	MMA Welding Machine	3
Tools (PPE)	6	Welding Helmet	12
	7	Hand Shield Armor	10
	8	Welding Goggles	12
	9	Safety Shoes	15
	10	Hand Gloves	50
	11	Apron	50
Accessories	12	Holder Confront	50
	13	Earth Clamp	50
	14	Welding Cable -CU	50 mts
	15	Hose - Oxygen	50 mts
	16	Hose - Acetylene	50 mts
	17	Protex RA (protection from reverse flow) - Acetylene	4

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	18	Protex RA (protection from reverse flow) - Oxygen	4
	19	Regulator - Acetylene	5
	20	Regulator - Oxygen	5
	21	Regulator - CO2	5
	22	CO2 Heater	5
Miscellaneous Items	23	Electrode/Flux Oven	1
	24	Cylinder Keys	10
	25	Lighter	10
	26	Big Hammer	1
	27	Hack Saw Frame	2
	28	Hack Saw Blade	5
	29	Cylinder-Trolley-Single Cylinder	6
	30	Spanner Set	1
	31	Screw Driver Set	1
	32	Pliers	2
	33	Hand Grinding Machines-100mm	2
	34	Adjustable Wrench	5
Spare Parts	35	Torch for TIG welding	2
	36	Collet	5

Confidential

		Protex RA (protection from reverse flow) -	
	18	Oxygen	4
	19	Regulator - Acetylene	5
	20	Regulator - Oxygen	5
	21	Regulator - CO2	5
	22	CO2 Heater	5
	23	Electrode/Flux Oven	1
	24	Cylinder Keys	10
	25	Lighter	10
	26	Big Hammer	1
	27	Hack Saw Frame	2
	28	Hack Saw Blade	5
	29	Cylinder-Trolley-Single Cylinder	6
	30	Spanner Set	1
	31	Screw Driver Set	1
	32	Pliers	2
Miscellaneous	33	Hand Grinding Machines-100mm	2
Items	34	Adjustable Wrench	5
	35	Torch for TIG welding	2
Spare Parts	36	Collet	5

Confidential

	37	Collet Body	5
	38	Ceramic Nozzle Size 11.2	15
	39	Ceramic Nozzle Size 6.4	15
	40	Tungsten Electrode	25
	41	Torch for MIG/MAG	2
	42	Liner-1.2mm 3mtrs	4
	43	Nozzle	5
	44	Contact Tip	15
	45	Feed Roll	15
	23	Exhaust Lining - Extract Fans	1+7
	24	Ducting for exhaust air	100 sqmt
Other Items	25	Welding tables	7

Confidential

2.5 Electronics

	Item No	Description	Qty.
Equipment	1	CCTV set up (4 camera)	1 system
	2	Washing machine (auto and semi-automatic)	1
	3	Vacuum cleaner	2
	4	Microwave oven 20 liters (two technologies)	1
	5	Mixer cum grinder	2
	6	Steam iron	4
	7	Electric rice cooker	3
	8	Water purifier (RO and UV technologies)	1
	9	Immersion Heater	4
	10	Induction cooktop	2
	11	Home theatre system including CD Player	1 Set
	12	Printers (DMP, laser)	1 each
	13	LCD/LED Projector	1
	14	DTH with accessories	1 Set
	15	LED TV	
	16	LCD TV	
General	17	Connecting screwdriver 100 mm	10
Tool	18	Neon tester 500 V	6

Confidential

19	Screw driver set (set of 5)	10
20	Insulated combination pliers 150 mm	6
21	Insulated side cutting pliers 150 mm	8
22	Long nose pliers 150 mm	6
23	Soldering iron 25 W. 240 V	10
24	Electrician knife	6
25	Tweezers 100 mm	10
26	Digital Multimeter (3 one /two digit)	10
27	Soldering Iron Changeable bits 10 W	6
28	De- soldering pump	10
29	Steel rule 300 mm	4
30	Steel measuring tape-3 m	4
31	Tools makers vice 100 mm (clamp)	1
32	Tools maker vice 50 mm (clamp)	1
33	Crimping tool (pliers)	2
34	Magneto spanner set	2
35	File flat 200 mm bastard	2
36	File flat 200 mm Second cut	2
37	File flat 200 mm smooth	2
38	100 mm flat pliers	4

Confidential

39	100 mm round Nose pliers	4
40	Scriber straight 150 mm	2
41	Hammer ball pen 0.5 kg	1
42	Allen key set (set of 9)	1
43	Tubular box spanner (set of 6Nos)	1 Set
44	Magnifying lenses 75 mm	2
45	Continuity tester	6
46	Hacksaw frame adjustable	2
47	Cold chisel 20 mm	1
48	Scissors 200 mm	1
49	Handsaw 450 mm	1
50	Hand Drill Machine	2
51	First aid kit	1
52	Fire Extinguisher	2
53	Bench Vice	1
54	Dual DC regulated power supply 30-0-30 V 2 Amps	4
55	DC regulated variable power supply 0-24 V, 1 Amps	2
56	LCR meter (Digital)	1

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	57	CRO Dual Trace 20 MHz (component testing)	2
	58	Signal Generator, 0-100 KHz	2
	59	Battery Charger	1
	60	Analog multimeter	4
	61	Function generator (Triangular, square and sine wave) Or ELECTRONIC WORK BENCH Instead of sr no (26,27,29,31,34)	2
	62	Dimmer start 3 Amps	2
	63	Analog Component Trainer	4
	64	Op Amp trainer	3
	65	Digital IC Trainer	4
	66	Digital IC Tester	1
	67	Digital and Analog Bread Board Trainer	6
	68	Rheostats various values and ratings	2
	69	POWER ELECTRONICS TRAINER with at least 6 no's of onboard applications	4
Lab Specific Tool	70	Fiber optic communication trainer	2
	71	SMPS trainer	1
	72	SMPS of different make (Set of 4)	4
	73	UPS trainer	1

Confidential

	High rate discharge tester (cell tester)	1
	Hollow Punch Set Of Seven Pieces 6mm to 15mm	2 Set each
	Hydraulic jack HI-LIFT type -3 ton capacity	1
	Multimeter digital	5
	Oil can 0.5/0.25 liter capacity	2
	Oil pump dismantling and assembling	2
	Oil stone 15X5X2.5 cm	1
	Oscilloscope 20MHz	1
	Outside micrometer 0 to 25 mm	4
	Outside micrometer 25 to 50 mm	4
	Outside micrometer 50 to 75 mm	1
	Outside micrometer 75 to 100 mm	1
	Pat melting	2
	Phlips Screw Drivers set of 5 pieces (100 mm to 300 mm)	2 Set
	Pipe cutting tool	2
	Pipe flaring tool	2
	Spl tools for John Deere Tractor	1 set
Ancillary	Compressor 5 Bar	1

Confidential

	Fuel injection pump (Diesel) inline	1
	Glow plug tester	2
	Granite surface plate 1600X1000 with stand and cover	1
	Grease gun	2
	Grover -3, 4, 6mm	1 each
	Growler	2
	Hacksaw frame adjustable 20-30 cm	10
	Hammer ball Peen 0.75 kg	4
	Hammer Chipping 0.25 kg	4
	Hammer copper 1 kg with handle	4
	Hammer mallet	4
	Hammer Plastic	2
	Hand operated (i)for crimping up to 4 mm and (ii) for crimping up to 10 mm	2
	Hand remers adjustable 10.5 to 11.25 mm, 11.25 mm to 12.75mm 12.75 to 14.25 mm and 14.25 to 15.75 mm	2 Set
	Hand shear Universal 250 mm	2
	Hand vice - 37 mm	2

Confidential

	Dividers 15 cm Spring	6
	Electrician Screw Driver 250 mm	6
	Hammer Ball Peen 0.5kg With Handle	6
	Hand File 20cm Second Cut File	6
	Philips Screw Driver Set Of 5 Piecs 100mm to 300mm	6
	Pliers Combination 20cm	6
	Screw Driver 20cm*9mm. Blade	6
	Screw Driver 30cm*9mm. Blade	6
	Scriber 15cm	6
	Spanner D.E Set Of 12 Pieces(6mm to 32mm)	6
	Spanner Ring Set of 12 Metric Sizes 6 to 32mm	6
	Spanner Socket With Speed Handle, T-Bar, Ratchet And Universal Upto 32 mm Set Of 28 Pieces With Box	6
	Steel Rule 30 cm Inch And Metric	6
	Steel Tool Box With Lock and Key (Folding Type) 400*200*150mm	6
	Wire Cutter And Stripper	6
	Fuel feed pump for Diesel	1

Confidential

2.9 Agro and Farm Equipment (Preferred brands: John Deere, Escorts, Mahindra)

	Item No	Description	Qty
Equipment		Tractor	1
		9 tine Std Rigid Cultivator Make Green System	1
		9 tine Zero Seed cum Ferti Drill Make Green System	1
		Harrow 7x7 Disc without tyre	1
		Harrow 7x7 Disc without tyre	1
		Fodder Harvester	1
		Multi Crop Thresher	1
		Centrifugal Pump With Electric Motor	1
		Submersible Pump Complete Unit	1
		DG Set 2.2KVA 5Hp Air Cooled Engine	1
		Sprinkler Type Irrigation Systems Complete Set	1
		Drip Irrigation Systems Complete Set	1
Tools Set		Allen Key Set Of 12 Pieces(2mm to 14mm)	6
		Caliper Inside 15 cm Spring	6
		Caliper Outside 15 cm Spring	6
		Center Punch 10 mm Dia *100 mm	6

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	59	vacuum pump
	60	plumb
	61	ratchet
	62	thermometer
	63	PVC tube
	64	tool bag
	65	adjustable screw spanner
	66	double end spanner
	67	screw driver star
	68	Screw driver flat
	69	ratchet spanner
	70	Compound pressure gauge
	71	pressure gauge with hose
	72	clamp on meter
	73	tester
	74	cleaning brush
	75	starting capacitor 45 mfd
	77	Stands
Other Items	78	Racks

Confidential

39	screw drivers
40	cutting pliers
41	electrical tester
42	files set
43	double spanner
44	screw spanner 6"
45	screw Spanner 8"
46	Allen Keys
47	sheet cutter
48	hacksaw frame
49	electronic weighing scale
50	wooden mallet
51	scissors
52	3/2 bolt & nut
53	gauge manifold
54	R-22 cylinder
55	sling sychometer
56	micron gauge
57	capillary tube finder
58	fin comb

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19	Spring bender
20	Tube cutter
21	Swaging tool
22	Pinching tool
23	Running capacitor 36 mfd
24	Starting capacitor 45 mfd
25	Anemometer
26	portable air blower
27	Nitrogen gas cylinder with accessories
28	clamp on meter
29	hammer ball type
30	cotton waste
31	bench wise
32	anchor fastener
33	portable drill machine 13 mm
34	measuring tape
35	spirit level 1 m
36	spirit level 1/2 m
37	steel scale
38	steel scale ft

Confidential

2.8 Refrigeration and Air conditioning (RAC)

	Item No	Description	Qty
Equipment	1	Scroll Chiller (Air cooled) -10 TR	1
	2	VRF IV Plus system - 8 HP	1
	3	Ducted split unit - 5.5TR	1
	4	Cassette unit - 1.5 TR	1
	5	High wall split (2 star) - 1 TR	1
	6	Window unit (2 star) - 1 TR	1
	7	Deep Freezer Hard Top - 100 Lts	1
	8	Bottle Cooler Hard Top - 300 Lts	1
	9	Bottle Water Dispenser - 20/20 Lts	1
	10	Cold room - 6000 BTU/ hr	1
Low Side Works	11	Ducting	30 sqmt
	12	Grilles / Diffusers	1 mt
	13	Insulation	20 sqmt
	14	Drain piping	30 rmt
	15	Electrical Wiring	300 mts
	16	Canvas Connection	1
Tools	17	Flaring tool	
	18	Pipe bender	

Confidential

Boxes	123	METAL BOX 3 MODULE	1
	124	METAL BOX 4 MODULE	1
	125	METAL BOX 6 MODULE	7
	126	METAL BOX 8 MODULE, LINEAR	1
	127	METAL BOX 8 MODULE, SQUARE	1
	128	METAL BOX 12 MODULE	1
	129	METAL BOX 18 MODULE	1
Neon	130	NEON PHASE INDICATOR RED	1
	131	NEON PHASE INDICATOR GREEN	1
	132	NEON PHASE INDICATOR YELLOW	1
Hotel Series	133	DND PANEL	1
	134	DND SWITCH	1
	135	MMR PANEL	1
	133	MMR SWITCH	1
	134	KEYTAG SWITCH (MECHANICAL TYPE 20A)	1
	135	SHAVER SOCKET	1

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Data/ TV/ Communic ation	103	RJ 11 (NO SHUTTER)	1
	104	RJ 11 (SHUTTERED)	1
	105	TWIN RJ11 (NO SHUTTERS) 1M	1
	106	RJ 45 (SHUTTERED)	1
	107	TV SOCKET	1
	108	RJ 45 COVER FOR KEY STONE TYPE	1
	109	GRIPPED CORD OUTLET	1
	110	BLANK OFF UNIT	1
Cover + Grid Frame	111	ADAPTER PLATE FOR 30 SERIES MECHANISM	1
	112	1-2M GRID & 1 M CF COMBINED	1
	113	1 - 2 M GF & 2 M CF	1
	114	3 M GF & 3 M CF	1
	115	3 MODULE UNIVERSAL GF AND 3 M CF	1
	116	4 M GF & 4 M CF	1
	117	6 M GF & 6 M CF	7
	118	8 M GF & 8 M CF - LINEAR	1
	119	8 M GF & 8 M CF - SQUARE	1
	120	12 M GF & 12 M CF	1
Metal	121	18 M GF & 18 M CF	1
	122	METAL BOX 1 & 2 MODULE	1

Confidential

	84	20A DP W / INDICATOR LAMP	1
	85	32A DP SWITCH	1
Sockets	86	6A 2-PIN/3-PIN (SHUTTERED)	1
	87	6A UNISOCKET (SHUTTERED)	1
	88	16A 3-PIN (SHUTTERED)	1
	89	6A / 16A 3-PIN (SHUTTERED)	1
	90	13A BS FLAT - PIN (SHUTTERED)	1
	91	20A 3-PIN SOCKET OUTLET WITH SHUTTER	1
	92	25A 3-PIN SOCKET OUTLET WITH SHUTTER	1
	93	13A MULTI-PIN SOCKET OUTLET WITH SHUTTER	1
Bell Push	94	6A BELL PUSH	1
	95	6A BELL PUSH 92 M SIZE 0	1
	96	6A BELL PUSH W / INDICATOR	1
	97	6A BELL PUSH W / INDICATOR (2 M SIZE)	1
Dimmer/FZ & Buzzer	98	DIMMER 400W	1
	99	DIMMER1200W	1
	100	STEP TYPE FAN REGULATOR	1
	101	DIMMER 400W IN SINGLE MODULE	1
	102	BUZZER	1

Confidential

	68	Blade packet - CROWN	10 Nos.
	69	Ball Pein Hammer 500 gms TIGER	10 Nos.
	70	Multi-meter 10 A range MASTECH-830BZ/Equivalent	10 Nos.
	71	Rawal jumper with bits no 8 -TIGER	10 Nos.
	72	Double End Spanner Set "6-22"-Eastman	5 Nos.
	73	Drilling machine 10mm - Black & Decker /Equivalent	5 Nos.
Switches	74	6A 1 - WAY	9
	75	6A 1 - WAY W / INDICATOR LAMP	8
	76	6A 2 - WAY	9
	77	16A 1 - WAY	8
	78	16A 1 - WAY W/ INDICATOR LAMP	4
	79	16A 2 - WAY	4
	80	6A 1-WAY SWITCH, 2 MODULE	1
	81	16A 1-WAY SWITCH, 2 MODULE	1
	82	6A 1-WAY SWITCH, 2 MODULE WITH INDICATOR	1
	83	16A 1-WAY SWITCH, 2 MODULE WITH INDICATOR	1

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	49	Cable plugs	5 nos
	50	Cable plugs	5 nos
	51	Insulation tapes	6 nos
	52	Insulation tapes	6 nos
	53	Multi meter leads	1 no
	54	Tube light holders	4 nos
	55	Wiring spring	1 no
Safety Equipment	56	Safety gears, (Helmet)	5
	57	Gloves	5
	58	Earthing Kit	1
	59	First Aid Box	1
	60	Fire extinguisher	1
Tools	61	Combination Plier 8" - TAPARIA	10 Nos.
	62	Screw Driver Set - TAPARIA	10 Nos.
	63	Screw Driver 903 - TAPARIA	10 Nos.
	64	Knife Big -BEST	10 Nos.
	65	Cutter 7 in 1 Stripper tool - POWERGRIP- PGCT - 8	10 Nos.
	66	Wire Stripper - NAGPAL	10 Nos.
	67	Junior Saw Frame GB	10 Nos.

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29	Tube light frame with choke	1
30	Calling bell	1
31	Ring Lugs for cable	10
32	Fork Lugs for cable	10
33	Pin Lugs for cable	10
34	Ring Lugs for cable	10
35	Fork Lugs for cable	10
36	Pin Lugs for cable	10
37	Ring Lugs for cable	10
38	Fork Lugs for cable	10
39	Pin Lugs for cable	10
40	Cable ties with holder	12 each
41	Twin tube light fitting box type	1 no
42	Soldering iron	1 no
43	Lead & paste / flux	1 each
44	Lamp holders	12 nos
45	Cable splitter	1 each
46	Cable splitter	1 each
47	Coaxial cable	10 mts
48	Cable splitter connectors	24 nos

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Accessories	11	Single core Multi strand wire - Green colour	90 Mtrs
	12	Single core Multi strand wire - Red colour	90 Mtrs
	13	Single core Multi strand wire - Black colour	90 Mtrs
	14	Single core Multi strand wire - Red colour	90 Mtrs
	15	Single core Multi strand wire - Black colour	90 Mtrs
	16	PVC Conduits	10 lengths
	17	Elbow	12
	18	Collar	12
	19	Bend	12 nos
	20	3 Way Junction Box	16
	21	4 Way Junction Box	16
	22	Casing & capping	2 Lengths
	23	Saddle (Metal)	24
	24	3 Pin Plug	3
	25	3 Pin Plug	2
	26	Lamp Holder	10
	27	Ceiling rose	4
	28	Adaptor	3

Confidential

2.7 Electrician – Home & Industrial

	Item No	Description	Qty.
	1	Electrical Working Board (Similar Attached Design)	1
	2	Display Boards for working Tools	1
	3	Electrical Rubber Mat	1
	4	Packs motor starter-Basic	1
	5	Packs motor starter-Tesys	1
	6	Packs motor starter -Speed driver	1
	7	DG Sets	1
	8	Transformers	1
	8.1	Thermal Imaging	1
	8.2	Insulation resistance	1
	8.3	Turns ratio test	1
	8.4	Magnetic Balance test	1
	8.5	Tan delta test	1
	8.6	Transformer oil break down voltage test	1
	9	Pumps	1
Equipment	9.1	Submersible pump 1hp with starter	1
Electrical	10	Single core Multi strand wire - Grey colour	90 Mtrs

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57	Network and Internet security trainer	2
58	LAN cable tester	2
59	Network cables - UTP	1 mtr
60	Network Cables - Coaxial, flat, ribbon	As required
61	LAN Cards, wi-fi LAN Card	5 each
62	Connectors For cables	As required
63	Power Meter	2
64	Media Convertor	4
65	8/16/24 port UTP jack panel	2
66	SC Couplers	12
67	SC Pigtails	12
68	RJ-45 connector	As required
69	Fluke Meter	2
70	Crimping Tools	6
71	Switch with POE port	2

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	37	Bench Vice	1
	38	Connecting screwdriver 100 mm	10
	39	Neon tester 500 V	6
	40	Screw driver set (set of 5)	10
	41	Insulated combination pliers 150 mm	6
	42	Insulated side cutting pliers 150 mm	8
	43	Long nose pliers 150 mm	6
	44	Soldering iron 25 W. 240 V	10
	45	Electrician knife	6
	46	Tweezers 100 mm	10
	47	Digital Multimeter (3 one /two digit)	10
	48	Soldering Iron Changeable bits 10 W	6
	49	De- soldering pump	10
Lab Specific Tools	50	Wireless Network Adapter	6
	51	Wireless Access Point	6
	52	Router	6
	53	Managed Layer 2 Ethernet Switch 8/16/24 port	2
	54	Managed Layer 3 Ethernet Switch 8/16/24 port	2
	55	Network Training System	2
	56	LAN Protocol Simulation and Analyzer Software	2

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17	Crimping tool (pliers)	2
18	Magneto spanner set	2
19	File flat 200 mm bastard	2
20	File flat 200 mm Second cut	2
21	File flat 200 mm smooth	2
22	100 mm flat pliers	4
23	100 mm round Nose pliers	4
24	Scriber straight 150 mm	2
25	Hammer ball pen 0.5 kg	1
26	Allen key set (set of 9)	1
27	Tubular box spanner (set of 6Nos)	1 Set
28	Magnifying lenses 75 mm	2
29	Continuity tester	6
30	Hacksaw frame adjustable	2
31	Cold chisel 20 mm	1
32	Scissors 200 mm	1
33	Handsaw 450 mm	1
34	Hand Drill Machine	2
35	First aid kit	1
36	Fire Extinguisher	2

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2.6 Information Communication & Technology

	Item No	Description	Qty.
Equipment	1	Server Computer	1
	2	Desktop Computer	10
	3	Laptop, Notebook	1 each
	4	Intel Mobile Desktop based PC with LCD monitor	1
	5	Tablet	2
	6	Printers: Laserjet, deskjet, passbook, mfd	1 each
	7	Network Printer	1
	8	5 KVA online UPS	2
	9	LAN cards, Wi- fi LAN cards	6
	10	LCD/DLP Projector	1
	11	UPS trainer	1
	12	UPS 3 KVA	1
General Tools Set	13	Steel rule 300 mm	4
	14	Steel measuring tape-3 m	4
	15	Tools makers vice 100 mm (clamp)	1
	16	Tools maker vice 50 mm (clamp)	1

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90	DOL starter	1
91	AC motor 1/4 HP	1
92	Frequency modulator and Demodulator trainer kit	2
93	PAM, PPM, PWM trainer kit	2
94	AM/FM Commercial radio receivers	2
95	Microcontroller kits (8051) along with programming software (Assembly level Programming)	4

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74	Precision set of screw drivers- T5, T6, T7	2
75	LCD TV (Trainer kit)	1
76	LED TV (Trainer kit)	1
77	LCD and LED TV	1 each
78	Allen key screw driver	1
79	Regulated power supply variable for cell phone repair	1
80	SAT meter	1
81	Co-Axial cable cutter	1
82	Jacket stripper/Coring tool for 500 series cable	1
83	Centre conductor cleaner	1
84	Universal drop trimmer for RG 6/11 cables	1
85	F-connector tool for RG 6/11 cables	1
86	F-connector compression tool for RG 6/11 cables	1
87	DSO (colour)	1
88	Soldering & De soldering Station	1
89	SMD Soldering & De soldering Station with necessary accessories	2

4.3.1 Identifying and onboarding of the resources for the project

Preparation of the human resource requirement of the project based on the center initiation. A team of 5 member resource management group will screen candidates in line with the job role, eligibility criteria and selection process. The staff will be deployed at the centers 1 month prior to the initiation of the center.

4.3.2 Induction program of the staff

The team will develop a detailed induction program covering project overview, systems & processes and role based training. It will be mandatory for every new hire to go through 3 days of induction program. The induction program trains the staff to understand the goal & objectives and the outcomes expected out of the project. They will also learn systems and processes to maintain standardized operations across centers. Role based training will be provided to the staff to manage day to day operations at the centers.

4.3.3 Training of Trainers

Training of the trainers will be planned in advance to ensure the qualitative delivery of the program at the field level. Regular reinforcement and refreshing training will be organized at the cluster level to ensure that the trainers are equipped with the advanced/latest market trends. Every trainer will be expected to clear the assessment post Training of Trainers to qualify for handling batches.

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COE Team

TRAINERS

Key Responsibilities:

- Successful delivery of training
 - Maintain discipline in the institute
 - Maintain batch file
 - Adherence to session schedules
 - Career counseling
 - Admission of candidates
 - Student's administration
 - Query handling
 - Assessment and certification
 - Report deviation to Centre In-charge
 - Proper handling and maintenance of equipment
 - Complete ownership of batches
- Qualification & Experience:**
- B. Tech/M. Tech
 - Expert trainer (1 per COE): 6 - 7 years
 - Senior trainer (6 per COE): 4 - 5 years
 - Trainers (4 per COE): 2 - 3 years.

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- Shall preferably carry professional qualification in project manager skills
- Role will require travelling to centers

Note: Responsibilities shall be reviewed and revised in due course of time based on the complexities and challenges faced while discharging the roles and responsibilities.

PROJECT MANAGEMENT TEAM

PROJECT MANAGER

Key Responsibilities:

- As project manager shall be responsible for achieving the overall project goals
- Shall in responsible for project planning, milestones, budgeting & goal settings for centers

- Shall be responsible for resource planning and hiring
- Shall define systems & processes for operational efficiency
- Shall be responsible for tracking and review of performance of clusters
- Shall conduct regular audits for Quality Control
- Shall be key SPOC for Stake Holder Management
- Shall coordinate with SISW and their SISW partners
- Shall be responsible to share dashboard, reports & MIS with Sponsors
- Shall be responsible for cost control and overall budget
- Level 3 Escalation for issue resolution related to Center, students or maintenance

Qualification & Experience:

- Graduate/ Post graduate in any discipline
- 10-15 years of total experience
- At least 5 years of experience in project management especially large scale projects
- Proficient with project management techniques

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t-SDI central COORDINATOR

Key Responsibilities:

- Career counseling
 - Admissions
 - Maintenance of records of a cluster
 - Prepare daily Reports and MIS of all centres
 - Office administration
 - Follow ups with students
 - Address student issues
 - Query handling
- Qualification & Experience:
- Graduate in any discipline
 - 2 to 3 years of administrative experience

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TRAINERS

Key Responsibilities:

- Successful delivery of training
 - Maintain discipline in the institute
 - Maintain batch file
 - Adherence to session schedules
 - Career counselling
 - Admission of candidates
 - Student's administration
 - Query handling
 - Assessment and certification
 - Report deviation to Centre In-charge
 - Proper handling and maintenance of equipment
 - Complete ownership of batches
- Qualification & Experience:
- ITI/Diploma with Electronics/Electrical/Automotive/Manufacturing
 - Manufacturing: Diploma in Mechanical or Production
 - Agriculture: diploma in tractor mechanic
 - 2 - 3 years of industry experience
 - 1 year training experience is added advantage

* An office boy will be hired as support staff for managing the labs

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Technical Skill Development Institute Team

CENTRE IN-CHARGE

Key Responsibilities:

- Manage TSDI centre administration and operation
- Centre readiness before commencement of training

- Batch planning and scheduling

- Monitor batch progression

- Training Delivery

- Smooth functioning of batches

- Trainer and batch reviews

- Coordinate with Project Management Team

- Equipment management in labs

- Assessment and certification of centre

- Trainer management

- Infra management

- Level 1 Escalation for resolution of issues

Qualification & Experience:

- 4 – 6 years of total experience in training

- 2 - 3 years in teaching and managing centre operations

COE Assistant	Equipment handling & operation	2	L.T.I / Diploma	2 to 3 years of industry experience, 1 year training experience is desirable
Cluster Coordinator	Good written & oral communication, filling system, documentation handling, operation	1	Graduate in any discipline	2 to 3 years of experience in counseling, coordination & documentation
Project Manager	Good leader, capable to define processes, project management techniques, operations handling, analytical, report writing	1 overall entire project	Graduate in any discipline, PMP certification	10 to 15 years of large scale projects experience Managing
Subject matter Expert	Technically strong, real time work experience, teaching skills	1 for each trade	B.E. with domain expertise	8 to 10 years of industry experience with at least 3 years in training, module creation, T3
t-SDI Trainer	Good written & oral communication, domain expertise, fair for teaching, filling system, documentation handling, operation		L.T.I / Diploma	2 to 3 years of industry experience, 1 year training experience is desirable

4.3 Centre staff and Trainer Profiles

Designation- Role	Expertise	Number per cluster	Minimum qualification	Minimum experience
Cluster Head/CQE Center head:	People & channel mgt., training, project management	1	Graduate / Post graduate in engineering	6 to 8 years of experience to 3 years' experience in project management
Centre Head for- SDI	Domain skills, Teaching, people mgt., general administration	5	Graduate / Post graduate in engineering	4 to 6 years of experience with at least 2 to 3 years' experience in teaching & centre handling
COE Sr. Trainer	Good written & oral communication, domain expertise, flair for teaching & conversant with engineering software.	6	Diploma/B.E.	3 to 4 years of industry experience, 1 year training experience is desirable
COE Trainer	Good written & oral communication, domain expertise, flair for teaching & conversant with engineering software.	3	Diploma/B.E.	1 to 2 years of industry experience, 1 year training experience is desirable

Batch is considered to be closed within 30 days of last session delivered for the batch

S.No	List	Status	Remarks
1	Batch file is up to date		
2	Online Assessments are completed		
3	Practical Assessments are completed		
4	Student scores uploaded on LMS		
5	Any slippage		
6	Drops Out details		
7	Certificate distributed		

Centre Name	Batch ID
Location	Trainer Name
COE/Cluster No	Sector/Course

TALENTEGE
LEARN. GROW. EVOLVE.

Batch Closure Checklist

4.2.7 Issuance of Certificate

All successful students will be provided certificate from Siemens & APSSDC. Pass students list will be sent to Siemens with a request for dispatch of the certificates. On receipt the same will be handed over to the students.

Student Certificate Sheet

Batch ID	
Location	
Center Name	
Class/COE Name	

TALENTEDGE
LEARN. GROW. THRIVE

Teacher Name	
Course	
Session Start Date	
End Date	

<<Auto populate all details on selection of Batch ID>>

Batch ID	Location	Center Name	Class/COE Name	Teacher Name	Course	Session Start Date	End Date
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							

4.2.8 Batch closure

A batch will be considered closed only after completing the placement activity and issue of certificate to the students. A batch file will be maintained which will file all admission forms, supporting documents, score cards, feedback forms, placement data and certificate issue with a top sheet to capture the closure report

Training Feedback Form

1. RELEVANCE																		
1.1. I am confident to use this learning for enhanced personal effectiveness	1.2. I am satisfied with the course	2. CBT	2.1. The structure of the course made it easy for me to understand	2.2. The information presented was in logical sequence	2.3. The methodology used (like exercises, simulations, videos, etc.) helped to understand the concepts	2.4. Time allocated for various topics was appropriate	2.5. The course was easy to start	2.6. It was easy to navigate through the course	3. TRAINER & Lab	3.1. Clearly explained & defined the "Course Objectives" at the start of the module.	3.2. Was knowledgeable and well prepared for Lab session	3.3. Handled questions effectively	3.4. Presented information in logical and structured manner	3.5. Listened to and responded to concerns & queries	3.6. Equipment working properly in labs	4. FACILITY	4.1. Cleanliness maintained in the classrooms	4.2. Cleanliness maintained in the washrooms
5	4	3	2	1	Disagree	Somewhat Agree	Strongly Agree											
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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4.2.5 Assessments

Learning outcomes must be monitored at regular intervals only then we can give timely feedback to the students for the scope of improvement. Hence, assessment will be conducted at the end of every module and a final assessment post training completion. Appropriate weightage will be given to modular scores and final scores to grade the student.

Pass Criterion

- a. Minimum pass percentage for a student in overall score will be 40%
- b. The program certificate shall be awarded to the student at the end of the program after considering the following:
- c. Student must successfully complete the program enrolled for.
- d. Must attain 75 % attendance for the program

Scores:

Module	Assessments	Total Marks
Module 1	CBT	10
Module 1	Lab	15
Module 2	CBT	10
Module 2	Practical	15
Final	CBT	25
Final	Practical	25

Certification Grade and Legend

Grade	Percentage	Legend
A+	90% and above	Outstanding
A	80% and less than 90%	Excellent
B	70% and less than 80%	Good
C	60% and less than 70%	Average
D	50% and less than 60%	Fair
E	40% and less than 50%	Need Improvement
F	Less than 40%	Failed

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Student Admission Documents Checklist

Centre Name	
COE/Cluster No	
Centre In-Charge	
Location	

Category	Things to check for	Compliance (Y/N)	Comments
Student Admission	Check for Education Qualification Certificate		
	Check for Beneficiary Form		
	Check for BPL Card (if BPL candidate)		
	Check for reserved Category certificate		
	Enquiry Form filled by student		
	Admission Forms are completely filled Specify as per GoAP requirement		

4.2.3 Batch Scheduling & commencement

Batches will be commenced as per the annual calendar. Prior intimation to the students will be provided about the batch start date and accordingly trainer and classroom will be prepared for the training. On the date of commencement the centre manager will address the students and set expectation along with intimation of the rules of the centre.

4.2.4 Attendance

Attendance register will be maintained to keep track of daily attendance of the students. It will be mandatory for the student to have 75% of attendance to qualify for the final assessment. Centre Manager will keep a check on the drop outs and absentees in the daily review of classes with the trainers.

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Student Admission form:

Ref No.

Date

(for office use only) <<Auto-generated number- Track the same number to Admission Form>>

PERSONAL DETAILS

A. Candidate's Name

B. Father's Name

C. Mother's Name

D. Sex M F

E. Date of Birth d d m M Y y y Y

G. Category Gen S/C S/T OBC

H. Person with disability Yes No

I. Languages known

J. Monthly Income (in rupees).....

EDUCATIONAL DETAILS

A. Academic Qualification

<input type="text"/> Diploma	<input type="text"/> Graduation	<input type="text"/> Post-Graduation	<input type="text"/> Non Professional
<<Specify Qualification if 8 th , 10 th or 12 th passed>>			

CONTACT DETAILS

Present Address

City

District

Pin

State

Permanent Address

City

District

Pin

State

Telephone
Mobile

E-mail:

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- Management of staff, students and Centre
- Facilitate audits and visits
- Resolution of student / Training related issues
- Daily reporting to back office team
- Report break downs or malfunction and send request for repairs and maintenance of furniture, fixture, and lab equipment to Project Management office

4.2.1 Career Counseling

Trainers from the CoE and TSDI will participate in any road shows conducted by APSSDC to provide career counseling to the walk-in. A student enquiry form will be used to capture the details of the students at the time of counseling. This will help to understand the profile of the student and recommend appropriate course. To make the selection of course more scientific, a trade fitment test also will be used to identify the suitable trades for the students.

4.2.2 Admission process

At the time of admission a detailed student data sheet will be used to capture relevant details of the students pertaining to his identity, address, qualification, job preference etc. The data sheet will help in keeping track of complete history of the student from admission, Training, assessment, certification and placement record. Relevant supporting documents to establish the credentials of the students will be collected and a copy of the same will be retained in the database.

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4.2 Day to day Operations

- Recruit and deploy Centre Staff that includes
- Centre In charge,
- COE trainers & assistants
- T-SDI trainers& assistants
- Office boys
- On boarding of these resources in advance to induct into the project & functional Train the trainer programs. (Details to follow)
- In case of any resignation, a trainer will be hired, trainer and replaced earliest possible.
- Manage day to day functioning of TSDI & COE. The activity broadly includes :
- Daily opening & closing of Centre, the timings of the centre will be 8.00 am to 5.00 pm and centre will function from Monday to Saturday. Sundays will be holiday apart from the declared holidays as per the calendar of APSSDC
- Admission process management: This will include filling up of admission form and collecting supporting documents as would be specified by APSSDC at the beginning of project.
- Batch scheduling: This will include batch planning, trainer allocation, classroom & lab allocation, and commencement of batches as per the said dates.
- Deliver training programs: This will include CBT and Practical training
- Practical Assessment: This shall be done as per the framework designed by the Subject Matter Experts
- Computation of assessment results of students and process certificates in coordination with PVSP and partners.

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Location	
COE/Cluster No	
Centre In-Charge	
Counselor	
Date of Audit	

Category	Things to check for	Compliance (Y/N)	Comments
Documentation	Banner display		
	Batch information displayed on notice board		
	Upcoming batch schedules are displayed on notice board/student area		
	Enrollment Forms are filled properly		
	Admission Forms are filled properly		
	LMS is updated		
	Documents are maintained properly: > Document 1 > Document 2 > Document 3		
	Cards issued to students on 2nd/3rd day of joining		
	Student issues are resolved		
	Drop outs are tracked and followed up		
	No Defaulters		
	Details of buffer student is maintained in LMS		
	Infra issues are resolved as per defined SLA		
	Classroom Session	All machines (Desktops/Laptops) are working properly	
Software was installed prior to commencement of training			
CBT installed in all machines as per course curriculum			
Student login IDs are available before commencement of CBT session			
Student to machine ratio is 1:1			
Attendance marked by students daily, bi-monthly/termly logins			
Proper Internet connectivity			
Lab Session	Trainer reached centre 15 minutes prior to training start time		
	Trainer formally dressed		
	Session starts on time		
	Session as per schedule/ defined milestone		
	Trainer shared the session plan		
	Interactive session		
	Equipments working properly		
	Appropriate handling of equipments		
	Proper start and shut down of equipments		
	Tools/ids are kept properly		
	Attendance Sheet is filled out every day with appropriate comments for late coming/absenteeism		
	Batch File is maintained along with LMS		
	Drop Outs details are maintained in batch file		
Infra Log File is maintained properly			
Infra Log File is reviewed regularly			
Overall	Air conditions are working properly		
	Classrooms are clean		
	Washrooms are cleaned on regular basis		
	Cleanliness around water dispenser		

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4.1.3 Inventory Management:

Inventory management is a critical requirement at the training center, maintenance of inventory records is needed. To ensure the qualitative delivery of the training program, batch wise requirement of consumables will be planned and procured in advance. Systems/formats are developed for procurement of consumables and stationery for the centers. Usage reports will be generated periodically. A maintenance log book will be maintained to monitor the same.

Maintenance Log

Batch ID	
Location	
Center Name	
Cluster/ODE Name	
Sector	



Trainer Name	
Room No/Name	
Session Start Date	
Session End Date	
Course	

<<Auto populate all details on selection of Batch ID>>

Sl. No.	Batch ID	Location	Center Name	Cluster/ODE Name	Sector	Trainer Name	Room No/Name	Session Start Date	Session End Date	Course
1										
2										
3										
4										
5										

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Governance Model					
Communication/ Review Event	Governance Body	Members	Meeting Frequency	Mode	Agenda
Quarterly Business Review	Executive Steering Committee	Core Team Members of GoAP, Siemens, Talentedge, Knowledge Podium	Quarterly	Face to Face	Executive level review of the overall relationship Final escalation point for unresolved issues
Monthly Operations Review	Program Management Team	Siemens and Talentedge	Monthly	Face to Face/ Telephonic	Review training feedback and draw up action plan for the way forward Review and resolve escalations brought up by the project team and other stake holders like Knowledge Podium and others
Senior Management Review	Project Management Team	Talentedge	Monthly	Face to Face/ Telephonic	Project review
Weekly Status Call	Project Team	Siemens and Talentedge	Weekly or as required for effective management of the program	Telephonic	Scheduling and execution of ongoing training sessions and monitoring the planned activities
Weekly Status Report	Project Team	By Talentedge Project Team	Weekly	PPT	Share progress against defined tasks for the previous week, list tasks scheduled for current week and any unresolved issue/support required

A three layer escalation matrix has been developed to ensure the transparency and quality in the training programs, Monitoring system will include the visits to the training centers by PMO and the cluster manager is planned periodically. Audit checklists are developed accordingly, after the audit completion, follow up on the compliance actions will be ensured.

ESCALATION MATRIX STUDENT									
	Level I			Level II			Level III		
	Name	Email ID	SLA	Name	Email ID	SLA	Name	Email ID	SLA
TSO	Centre in-charge	ts@talentedge.in	2 working days	Centre in-charge	ts@talentedge.in	2 working days	Project Manager	pm@talentedge.in	3 working days
COE	Cluster in-charge	ts@talentedge.in	2 working days	Project Manager	pm@talentedge.in	2 working days	Project Lead	pl@talentedge.in	3 working days
Any issue unresolved for more than a week	Project Manager	pm@talentedge.in	3 working days	Project Lead	pl@talentedge.in	3 working days	Siemens SPOC	spoc@siemens.com	3 working days

ESCALATION MATRIX EMPLOYEE									
	Level I			Level II			Level III		
	Name	Email ID	SLA	Name	Email ID	SLA	Name	Email ID	SLA
TSO	Centre in-charge	ts@talentedge.in	2 working days	Project Manager	pm@talentedge.in	2 working days	Project Lead	pl@talentedge.in	3 working days
COE	Cluster in-charge	ts@talentedge.in	2 working days	Project Manager	pm@talentedge.in	2 working days	Project Lead	pl@talentedge.in	3 working days
Any issue unresolved for more than a week	Project Manager	pm@talentedge.in	3 working days	Project Lead	pl@talentedge.in	3 working days	Siemens SPOC	spoc@siemens.com	3 working days

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- Maintain project related dashboard and reports and share with PVSP as per the defined periodicals
- Define processes & manual, design related templates to manage training and project
- Project Management team shall accompany PVSP during the review meetings presided by APSSDC
- Handhold the staff deputed by APSSDC during the project period

4.1.1 Project planning, milestones, budgeting & goal setting for Center Operation

The project Management office will drive the overall project goals & objectives. They shall be responsible for performance review of cluster and TSDI and guide corrective improvements. They will conduct the budgeting exercise and regularly review the same with the team to steer the activities.

4.1.2 Stake Holder Management

Project manager will apprise the stake holders and leaders on regular intervals and there will be scheduled review meeting face to face with APSSDC and Siemens to discuss up on the progress. The entire project will be managed with a governance structure and at every level there will be appropriate checks and balances to maintain business continuity.

4. Centre Operations

4.1 Operational Project Management

- Deploy project management team lead by a project manager and supported by Cluster In*charge to administer the overall operations of the 6 CoEs and 30 TSDIs.
- Deploy project manager, who shall be on boarded 2 months before the launch date of the project.
- The project manager will be responsible for the achievement of overall project goals, and supervision of the COE & TSDIs. Roles & responsibilities of project manager will be as defined in annexure no. 1
- Recruit & deploy Cluster In charge cum Centre Manager at COE for administration of CoE and cluster TSDIs. A total of 6 Cluster in charge and 6 Cluster Coordinators will be recruited for the project. On boarding of these roles will be done 2 months before start date of the respective cluster.
- Practical training & assessment framework designed by Subject Matter experts, design T3 and conduct Train the Trainer (T3), quality monitoring
- Coordination and schedule of T3 as and when required.
- Maintain budgeted staff strength at TSDI's during the project period.
- Track and review operations of COEs and TSDI's to ensure smooth functioning at all times
- Support CoE and TSDI teams in resolving issues that hamper functioning of centre. These issues may be related to different stake holders, like, PVSP partners, SISW, APSSDC, College administration and students.
- Review quality of delivery and conduct periodic audits as shall be defined

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3.3 Center operation (training and student management) for 3 years

- Maintain budgeted staff strength at COEs and t-SDIs during project period.
- Manage day to day functioning of t-SDI & COE. The activity broadly includes center operation as per opening hours and holiday schedule of APSSDC, admission process management, batch scheduling, organizing periodic train the trainer programs, delivery of training including Assessment (Practical) as per the guidance of subject matter experts and industry partners, management of staff, students and center, resolution of student / training related issues, and daily reporting.
- Support teams in resolving issues that hamper functioning of center. These issues may be related to different stake holders, like System Integrator, Content Partner, APSSDC, Host institution and other constituents of this project involved in execution.
- Student certification coordination with SISW, DT and the content partners. This shall be tallied with the admission and assessment reports per institution.

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3.2 Center Set-up

Set up 6 COEs and 30 t-SDIs by supply, installation and system integration of the supplied hardware, software, courseware, manpower and all other supplies as detailed in the scope of supply as per the agreement to the institutions identified by APSSDC. This will involve the Procurement, Installation, Testing, Commissioning, Maintenance, Insurance and Operations of the overall project. It broadly involves:

- Provide site preparation guidelines as per each lab to APSSDC nominated institutes, and obtain signoff on the site readiness.
- Procurement of the hardware, courseware, implementation, training and services for the below labs as per the bill of material below for the labs.
- Finalize layouts with vendors for specific lab set-ups with the institutions depending on space allocation and recommended plans
- Installation and testing for all labs
- Ensure timely installation and testing of equipment before it is handed over to the operations partner
- Maintenance, consumables and insurance
- The annual maintenance contracts with vendors and equipment suppliers
- Repair of machines for damage caused by wear and tear, both covered under AMC and otherwise.
- Insurance of equipment
- Consumables required which are not covered by institutions (includes consumables for the labs and minor replacements for hand tools)

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3.1 Overall Project Management & Audit

Set up a project management team to execute this project; appoint a project director who will act as the single point of contact between SISW, DT and APSSDC, and will also be nominated to the Governance Board for this project (for the duration of the project)

- Project Management team shall accompany SISW and DT during review meetings presided by APSSDC
- Identify, establish and maintain project management office in APSSDC
- Handhold the team deputed by APSSDC in 3rd year as part of transition and handover
- Implement and integrate systems for the project in active collaboration and assistance with SISW & DesignTech
- Conduct audits once a quarter and provide Utilization report for the setup
- Formal audit report once a year
- Provide project MIS to SISW, DT and APSSDC and other required parties on monthly basis
- Maintain a separate account to record the up-to-date operational expenditure of the COEs and t-SDIs for entire project, to be submitted periodically together with DT to APSSDC.

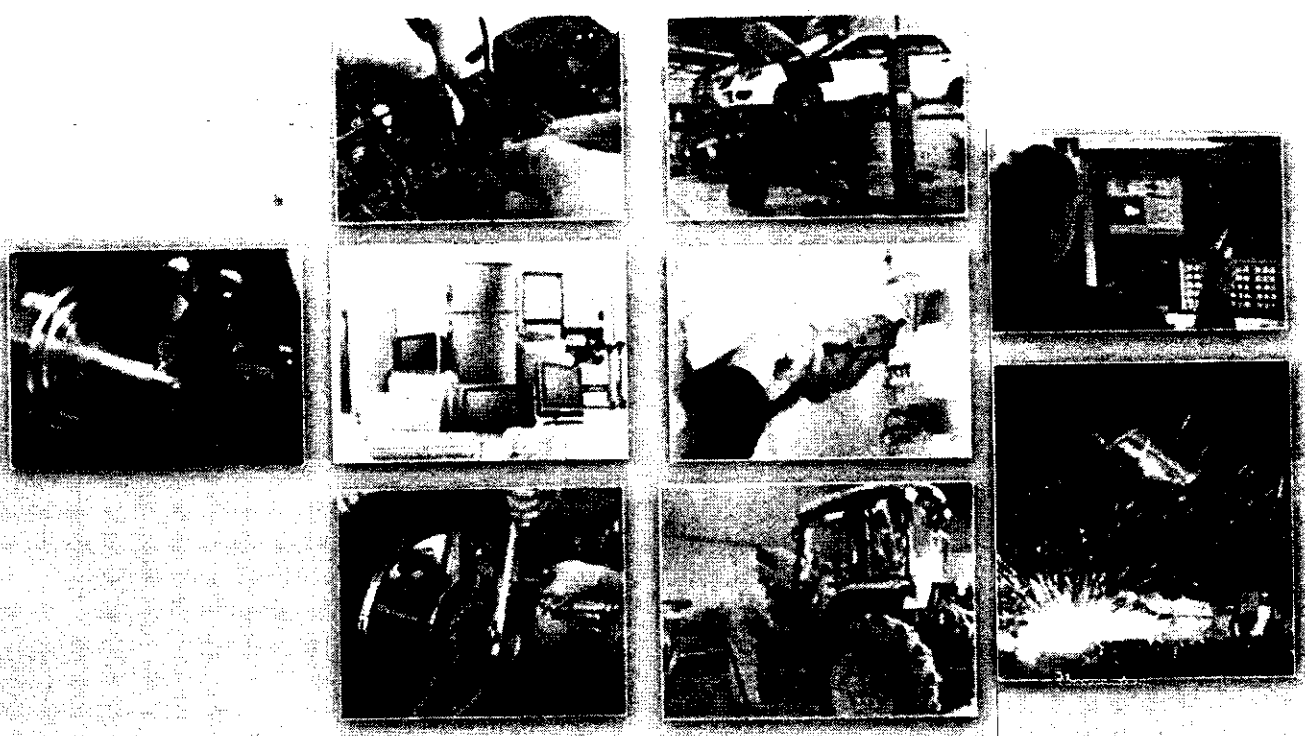
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3 Services and other OPBX

Services include deployment of human resources comprising of project management, teaching staff, management of daily operations of the centres for a period of 3 years and handholding the deputed APSSDC staff during the 3 years of operations.

All equipment will be insured and under maintenance contracts

Periodic Train the trainer programs will be scheduled as per the industry partner requirement. Details as follow.



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2.10 Engineering Design & Engineering Drawing Lab

84 workstations which will run the Computer based training modules and Engineering Design and drawing courses.

Workstations configuration: (Preferred Brands: HP, Dell, IBM, Lenovo, Fujitsu)

Intel® Xeon® i5 processor

Windows® 7 Professional 64 bit (English)

16 GB DDR4 RAM

2 GB graphics Card

500 GB HDD

19 inch TFT Monitor

MS Office

Antivirus

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		Pneumatic Linining	1 Set
		Radiator	1
Cut Section		Engine	1

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Evaluation Sheet - T3

SME Name	
Trainer Name	
Sector	Automotive
Course	2 wheeler



T3 Location	
TSDI Location	
Total Score	100

S.No	Evaluation Date	Module	Score	Remarks
Total			0	

4.3.4 Monitoring and evaluation of the staff and conducting the trainings

Prepare and execute the monitoring and evaluation of all the trainers/positions to ensure qualitative delivery of the program. The periodical reviews and assessments will help to bring uniformity in delivery of the program across all the centers.

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4.3.5 Preparing the manpower requirement plan for month on month and deploying the staff accordingly.

As the project is large with state wide operations, it is required to prepare the manpower plan in advance factoring the attrition levels. A data bank of screened and shortlisted candidates will be maintained to maintain business continuity center.

Sr	Location	Position	Grade	Role	Status	Start Date	Activity
1	Hyderabad	PMO	PMO	Project Manager	Approved	1-Aug	Screening
2	Hyderabad	PMO	PMO	NIS Coordinator	Yet to Open		
3	Guntur	CI	CI/ COE	Cluster In-charge	Approved	1-Sep	Screening
4	Guntur	CI	CI/ COE	Cluster Coordinator	Approved	1-Sep	Screening
5		CI	CI/ TSDI 1	Centre In-charge	Yet to Open		
6		CI	CI/ TSDI 1	Trainer 1	Yet to Open		
7		CI	CI/ TSDI 1	Trainer 2	Yet to Open		
8		CI	CI/ TSDI 1	Trainer 3	Yet to Open		
9		CI	CI/ TSDI 1	Trainer 4	Yet to Open		
10		CI	CI/ TSDI 1	Trainer 5	Yet to Open		
11		CI	CI/ TSDI 1	Trainer 6	Yet to Open		
12		CI	CI/ TSDI 1	Office Boy	Yet to Open		
13		CI	CI/ TSDI 2	Centre In-charge	Yet to Open		
14		CI	CI/ TSDI 2	Trainer 1	Yet to Open		
15		CI	CI/ TSDI 2	Trainer 2	Yet to Open		
16		CI	CI/ TSDI 2	Trainer 3	Yet to Open		
17		CI	CI/ TSDI 2	Trainer 4	Yet to Open		
18		CI	CI/ TSDI 2	Trainer 5	Yet to Open		
19		CI	CI/ TSDI 2	Trainer 6	Yet to Open		

4.3.6 Evaluation and feedback from the aspirants on the training delivery and improvements.

To ensure the quality in the project delivery, the system of feedback on training delivery mechanism is been developed for the students to express their feedback on the training. This system will ensure the minimization of gaps in the training delivery.

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4.4 Development of Process Documents, MIS and Evaluation Templates

4.4.1 Development of MIS templates, Audit systems and evaluation parameters.

Activity based templates, formats are developed to ensure the quality and standardize operations

- Operations manual
- Induction modules
- Student Data Sheet
- Course allocation template
- Batch schedule plan for the cluster
- Assessment schedule and the template
- Student feedback form
- Governance Matrix
- Template for procurement
- Center visit and Audit report
- Training schedule and the assessment of trainers
- Student individual development template
- Technical assessment
- Monitoring, Reporting and Evaluation(MoRe)
- Maintenance log file
- Training & Assessment Tracker and Dashboard

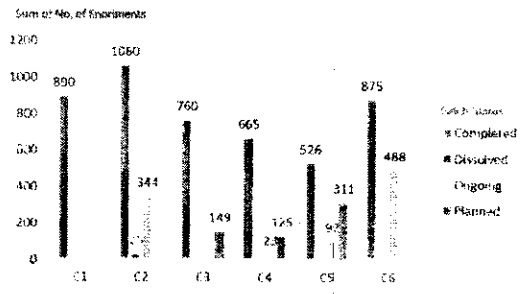
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4.4.2 Reporting

MIS reports, trackers and dashboards will be created and shared regularly with stakeholders and sponsors to show the project progress, milestones, goals and outcomes. This will also help to address open issues related to centre, students, partners etc. This will ensure that the business continuity is maintained at all times. The reports generated will help in developing the need based systems.

Training Status

Sum of No. of Enrolments	Completed	Disolved	Ongoing	Planned	Grand Total	
C1	24				24	
C5	84				84	
C1	245				245	
C2	201		25		226	
C3	435				435	
C4	225				225	
C6	159				159	
C5	258				258	
C1	411				411	
C2	489				489	
C3	325				325	
C4	217				217	
C6	111				111	
C5	184				184	
C1	160				160	
C2	370		344		714	
C4	223		23		246	
C6	605		488		1093	
C5			97		97	
C1	50				50	
C3				149	149	
C4				125	125	
C5				311	311	
Grand Total	4774		25	952	585	6338



Result Summary

Row Labels	Sum of No. of Enrolments	Sum of Attendance	Sum of Pass	Sum of Fail	Pass %
Declared	108	87	79	3	91%
Declared Pending	1357	1307	1021	220	78%
Cancelled	164	145			
Cancelled	25				
Declared Pending	1210	1131	914	238	81%
Pending	527	435			
Pending	2310				0%
Pending	635				0%
Grand Total	6338	3105	2014	451	

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4.4.3 Improving the MIS and other systems as the project will be scaled to all the districts of the project arena.

The project by nature is very large, and in real time implementation improvisation in the MIS formats will happen at every stage of the project, this will help with gaining better control on the project and outcomes.

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4.4.4 Developing the Audit and compliance reports and follow up.

Audits at each stage of the project is scheduled in prescribed timelines, every activity and process is audited to ensure the quality, adherence to the audit parameters is made mandatory at every stage and activity, compliance actions will be recorded and analyzed. The three layered escalation matrix is developed to bring in the accountability and quality at every stage/activity/process of the project.

Location	
COE/Cluster No	
Centre In-Charge	



Description	S No	Components	Required	Specifications Required	Additional Remarks	To be filled by TE SPOC	Remarks (if any)
CBT Class Room	1	Desk/Chair for Student	For all students		Service Provider to ensure that sufficient space is available to accommodate 25 people	Lab Capacity	
	2	Air Condition & Lights with Backup	For all students	Sufficient Cooling	Required AC and lights should be available in all the class rooms.	# of AC installed Capacity (Tons)	
	3	Desktops 11.6" upto with macOS, Software package, Antivirus, 4 GB RAM, 128 GB HDD/SSD	For all students			Qty: Yes/No	
	4	Internet with 2 Mbps				Yes/No	
	5	Specify browser/CBT one				Yes/No	
	6	CBT installed	For all students			Yes/No	
Lab	1	Equipment for Sector/Course A	For all students		Service Provider to ensure that sufficient space is available to accommodate 25 people	Lab Capacity	
	2	Equipment for Sector/Course B	For all students		Service Provider to ensure that sufficient space is available to accommodate 25 people	Lab Capacity	
	3	Equipment for Sector/Course C	For all students		Service Provider to ensure that sufficient space is available to accommodate 25 people	Lab Capacity	
	4	Air Condition & Lights with backup	For all students	Sufficient Cooling	Required AC and lights should be available in all the labs	# of AC installed: Capacity (Tons):	
Non IT Infrastructure Hardware	1	White Board / Chart Board/Marker (3 Nos) /Eraser	1 per venue	Mandatory		Yes/No	
	2	Power Backup with UPS for Computer, Lights & Fans	1 per venue / As Required	Mandatory	Gen-Set / Service Provider to ensure no problem w.r.t electricity	Yes/No	
Stationery	1	Enquiry Form, Admission Form, Attendance Sheet, Feedback Form, Sample objects	For All pax	Mandatory		Yes/No	

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Training Audit Checklist

Auditor	
Centre Name	
COE/Cluster No	
Trainer Name	
Centre In-Charge	
Location	
Course	
Date of Audit	



Category	Things to check for	Compliance (Y/N)	Comments
Classroom Session	CDT installed in all machines		
	Student to machine ratio is 1:1		
	Attendance marked by students daily		
	Proper internet connectivity		
	Software was installed prior to commencement of training		
Lab Session	Trainer reached centre 15 minutes prior to training start time		
	Trainer formally dressed		
	Session starts on time		
	Trainer shared the session plan		
	Recap of previous session		
	Objective well defined		
	Session as per schedule/ defined milestone		
	Interactive session		
	Equipments working properly		
	Appropriate handling of equipments		
	Proper start and shut down of equipments		
	Attended IT program before delivering session and cleared MOCN session		
	Ability to handle queries		
Credibility with students			
Rapport with students			
Attendance sheet is filled out everyday with appropriate comments for late coming/absenteeism			
No. of Drop Outs			

5 Training of Trainers

5.1 Train the Trainer (Facilitator)

The digitally interactive learning systems necessitate more the role facilitators, rather than teachers/ trainers. The facilitators address student learning problems, coordinate industry projects and interactions, and conduct the various learning administration processes viz. availability of necessary IT infrastructure, centre/course registration, student certification, etc.



- A certified COE trainer delivers the entire training module
- This gives the trainer candidates an opportunity to see the program and how the various modules fit together



- The hand-on portion covers the following objectives:
 - Explain what, why and how behind each critical topic and skill
 - Handle challenging questions on applications and nuances of the skills
 - Coach and facilitate application of concepts, tools and techniques to real life situations.



- The trainer will work in 1-2 person teams to deliver the training and master trainer will evaluate and make any course corrections.
- Certificate is awarded upon successful completion of the established criteria

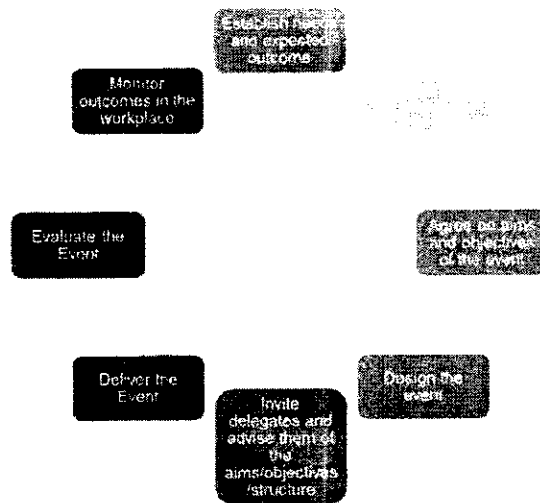


- In order to maintain certification the trainer has to conduct training at least once in every 6 months
- The trainer has to upgrade his skill once annually

“Train the Trainer” (Facilitator) program aims to develop facilitators equipped with necessary skills and tools to facilitate the self-learning process of students. They are trained to impart training using Verbal, Visual & KINESTHETIC approaches, and are equipped to train in both Instructor led & Self-paced learning methods.

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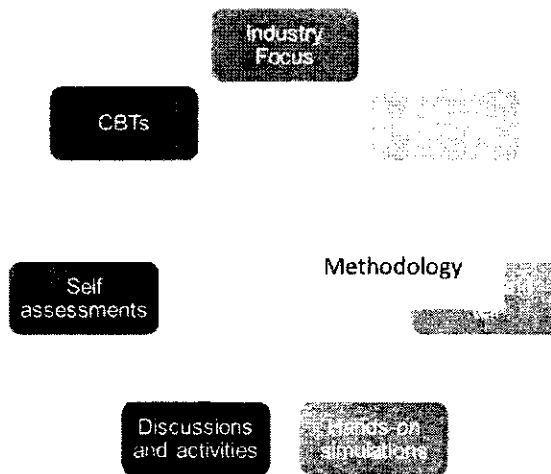
UNDERSTANDING THE TRAINING PROCESS: The program starts by establishing needs and outcome of the training, profiling of trainers attending the training, designing specific training requirements and inviting delegates and trainers. Once the preliminary preparation is done, the training is delivered. The outcome is evaluated both in the training environment and at the institute.



- a. **ASSESSING TRAINING NEEDS:** Design training program based on specific needs of institute requirement or trainer. A facilitator can be equipped to impart training across functions based on the self-paced learning methods.
- b. **DESIGN AND DEVELOPMENT OF THE TRAINING PROGRAM:** The program follows “Present, Pair, Co-teach and Assume (Take over)” model. First the candidates are trained by a certified COE trainer. Then the candidates pick up certain topics and present, after which they get paired with a certified trainer to co-teach a class, before they finally assume the complete responsibility and take over the full training session. This rigorous process ensures that the new trainers are evaluated and feedback is provided at all stages of their training.

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- c. **UNDERSTANDING LEARNING STYLES:** Each candidate has his own learning style. The program enables the candidate to access learning styles of their students and modify the pace of the modules accordingly.
- d. **USING VARIOUS TRAINING TECHNIQUES:** A trainer needs to have additional skills other than subject matter expertise. The program is designed to include various training techniques as well as personal skills to be a good trainer.



- e. **PRESENTATION SKILLS TRAINING:** The program includes honing trainer candidate's presentation skills during presentation & co-train sessions.
- f. **GIVING AND RECEIVING FEEDBACK, AND ASSESSING TRAINING:** The program includes two-way feedback at different stages.

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5.2 Train the trainer schedule for COE labs:

S.no	Lab	Trainer Days*	Certification of the trainer	Certification of the student
1	Product Design and Validation Lab	30	Yes	Yes
2	Advanced Manufacturing Lab	30	Yes	Yes
3	Automation Lab	24	Yes	Yes
4	Electrical & Energy Efficiency Lab	22	Yes	Yes
5	Process Instrumentation Lab	31	Yes	Yes
6	Mechatronics Lab	42	Yes	Yes
7	Test and Optimisation Lab	30	Yes	Yes
8	Advance Machine & Robotics Lab		Yes	Yes
9	Automotive Body Repair Lab	15	Yes	Yes
10	Automotive Paint Lab	15	Yes	Yes
11	Lift Installation and Maintenance Lab	15	Yes	Yes

*Trainer Days subject to change according to candidate's expertise level

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5.3 Train the trainer schedule for t-SDI labs:

S.no	Name of the Lab	No of days for Train the trainer	Certification of the trainer	Certification of the student
Automotive Sector				
	4 Wheeler Lab	15	Yes	Yes
	Auto Body Repair	15	Yes	Yes
	Auto Paint Shop	15	Yes	Yes
	2 Wheeler Lab	15	Yes	Yes
Electrical Trade				
	Home & Industrial Electrical Lab	15	Yes	Yes
	Refrigeration & Air conditioning Lab	15	Yes	Yes
	Lift Lab	15	Yes	Yes
Electronics Trade				
	Home Electronics Lab	15	Yes	Yes
	ICT Lab	15	Yes	Yes
Manufacturing and Fabrication Trade				
	CNC Lab	15	Yes	Yes

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	Welding Lab	15	Yes	Yes
Agriculture & Agro machinery				
	Agriculture Lab	15	Yes	Yes

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6 Institute Requirements for COE (to be provided by the Institute/MSDC)

6.1 Summary

Labs in Centre of Excellence:

S.no	Lab	Area(sft)	Power Consumption
1	Product Design and Validation Lab	800	10 KVA
2	Advanced Manufacturing Lab	800	10 KVA
3	Automation Lab	800	15 KVA
4	Electrical & Energy Efficiency Lab	1200	15 KVA
5	Process Instrumentation Lab	800	15 KVA
6	Mechatronics Lab	800	15 KVA
7	Test and Optimisation Lab	800	15 KVA
8	Advance Machine & Robotics Lab	2500	180 KVA
9	Automotive Body Repair Lab	1,200	7 KVA
10	Automotive Paint Lab	1,200	10 KVA
11	Lift Installation and Maintenance Lab	1,200	15 KVA
12	Common Area	1000	

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6.2 Basic Requirements

- **Built-up Area:** The Siemens CoE requires 13,000 sq ft in the Institute premises. The setup can be divided into two parts if block allocation is a challenge. A minimum requirement of 7000 sq ft on the ground floor is necessary to house labs with heavy machinery. Required ground floor height of 16-18 ft.
- **Civil Infrastructure:** All required civil infrastructure for the labs including flooring, partitioning, false ceiling and other equipment specific civil work needs to be carried out by the institute.
- **Electrical:** 3 phase, 320 KVA transformer rating, Commercial/ Industrial Panels required.
- **Site preparation:** 3-phase electrical supply points, pneumatic lining and hydraulic piping where required.
- **Facilities:** Furniture, Air conditioning, Smart-boards/Projectors, PA System and LAN Networking in the areas indicated to be provided by the college
- **UPS & DG set:** UPS back-up and DG set is required to ensure continuous operation of the facility

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6.3 Product Design and Validation Lab

S. No.	Description	Requirement
1	Room Size	L x W x H :: 40' x 30' x 12' (At least 800 Sft)
2	Computer Table for Work Stations	30 Nos, U shape arrangement is preferred
3	Table for LCD Projector	One table required if wall mount projector is not available. To be located near the trainer's table.
4	Executive Chairs	30 Nos.
5	Table & Chair for trainer	1 Nos.
6	White-Board	1 qty. (6' X 4')
7	Remote Controlled Sliding Projector-Screen	1 qty. (6' X 4')
8	LCD Projector	1
9	Power point for LCD projector	5amp point to be provided near the LCD projector table.
10	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station
11	Networking for Work stations	CAT 6 cable
12	UPS back up for all Work stations	To be arranged by the institute

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13	Electric cabling from UPS to all Work Stations, Switches & Projector	5 amp , 3 points for each work station
14	LAN Connections	32Points. (30 for WorkStation, 2 at Trainers Table)
15	Air conditioning	Adequate to maintain 22°C – 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant

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6.4 Advanced Manufacturing Lab

S. No.	Description	Requirement
1	Room Size	L x W x H :: 40' x 30' x 12' (At-least 800 Sft)
2	Computer Table for Work Stations	30 Nos, U shape arrangement is preferred
3	Table for LCD Projector	One table required if wall mount of projector is not available. To be located near the trainer's table.
4	Executive Chairs	30 Nos.
5	Table & Chair for trainer	1 Nos.
6	White-Board	1 qty. (6' X 4')
7	Remote Controlled Sliding Projector-Screen	1 qty. (6' X 4')
8	LCD Projector	1
9	Power point for LCD projector	5amp point to be provided near the LCD projector table.
10	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station
11	Networking for Work stations	CAT 6 cable

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12	UPS back up for all Work stations	To be arranged by the institute
13	Electric cabling from UPS to all Work Stations, Switches & Projector	5 amp , 3 points for each work station
14	LAN Connections	32Points. (30 for WorkStation, 2 at Trainers Table)
15	Air Conditioning	Adequate to maintain 22°C – 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant

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6.5 Test and Optimization Lab

S. No.	Description	Requirement
1	Room Size	L x W x H :: 40' x 30'x12'
2	Computer Table for Work Stations	30 Nos, U shape arrangement is preferred
3	Table for LCD Projector	One table required if wall mount of projector is not available. To be located near the trainer's table.
4	Executive Chairs	30 Nos.
5	Table & Chair for trainer	1 Nos.
6	White-Board	1 qty. (6' X 4')
7	Remote Controlled Sliding Projector-Screen	1 qty. (6' X 4')
8	LCD Projector	1
9	Power point for LCD projector	5amp point to be provided near the LCD projector table.
10	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station
11	Networking for Work stations	CAT 6 cable

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12	UPS back up for all Work stations	To be arranged by the institute
13	Electric cabling from UPS to all Work Stations, Switches & Projector	5 amp , 3 points for each work station
14	LAN Connections	32Points. (30 for WorkStation, 2 at Trainers Table)
15	Fixture for scaled model	Detailed specification as per actual site allocation
16	Test equipment support work (Electrical Work, Furniture, Networking)	To vary as per actual site allocation
16	Air Conditioning	Adequate to maintain 22°C – 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant

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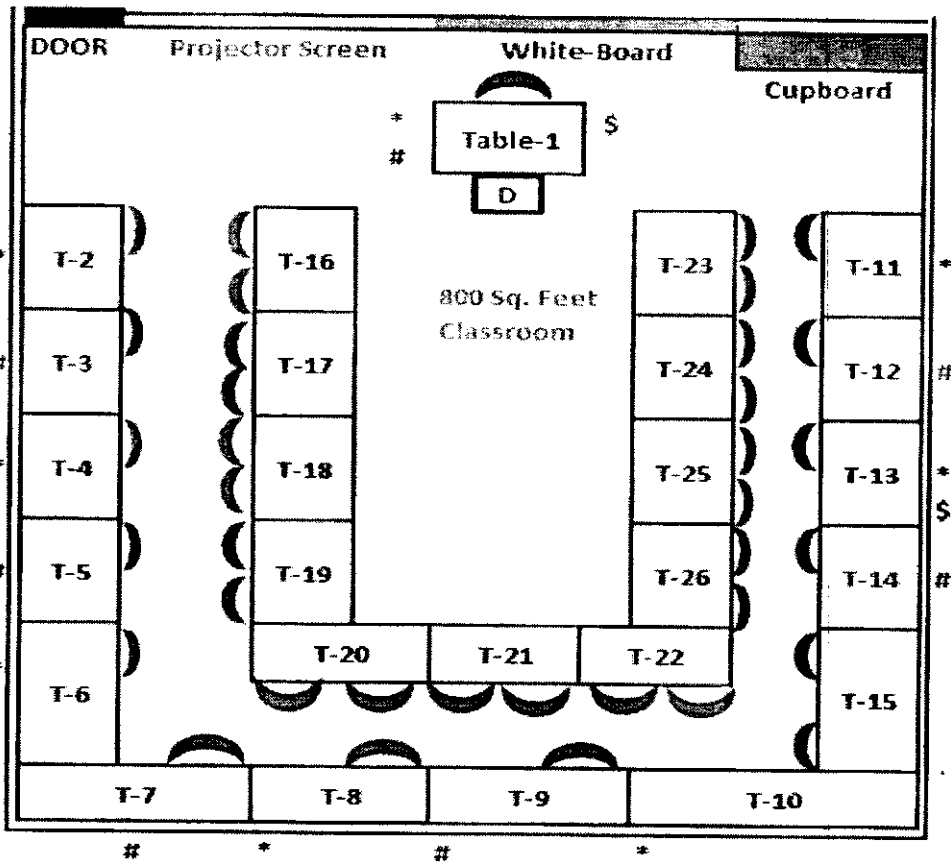
6.6 Automation Lab

S. No.	Item / Work description	Quantity	Specifications
1	Wooden Tables	26	Wooden tables with rubber bushing (Grey coloured with hole for cables)
2	Executive Chairs	26	Blue Colour
3	Heavy Duty Trolley	1	Capable of carrying kit weight of Max 50Kg.
4	Table for LCD Projector	1	To be located near the trainer's table if provision for ceiling mount is not available.
5	Sliding White-Board	1	(6' X 4')
6	Sliding Projector-Screen	1	(6' X 4')
7	LCD Projector	1	
8	UPS back up for all Work stations & Training Kits	-	Combined UPS recommended instead of one for each station
9	Electric Cabling from UPS to all Work Stations, Switches, & Projector	3 points for each work station	5 AMP
10	Electric Cabling from UPS to all Kits (1-	7 Points	2 x 3 pin Sockets (1.0 Ampere totally per point)

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	Phase points (230v/50Hz))		
11	3-Phase points (3ph-415v/50 Hz)	2 Points with round socket (6 A MCB with Each Socket)	
12	Power point for LCD projector	5amp point to be provided near the LCD projector table.	
13	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station	
14	Networking for Work stations And Kits	CAT 6 cable	
15	LAN Connections	15 Nos. (7 for Kits & 8 for Workstations) Refer layout for locations	
16	Air-conditioners	Adequate to maintain 22°C - 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant	

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Furniture		H	L	D
T1	Front Wooden Covering	2.5'	5'	2'
T2-T15	No Covering	2.5'	4.5'	1.5'
T16-T23	Front Wooden Covering	2.5'	5'	2'
D	Movable trolley	2'	2.5'	2'
\$	3-Phase Power Supply 415V AC / 50 Hz for Kits			
*	1-Phase power Supply 230 V AC /50Hz for Kits			
#	WorkStation and its power supply			

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6.7 Electrical and Energy Efficiency Lab

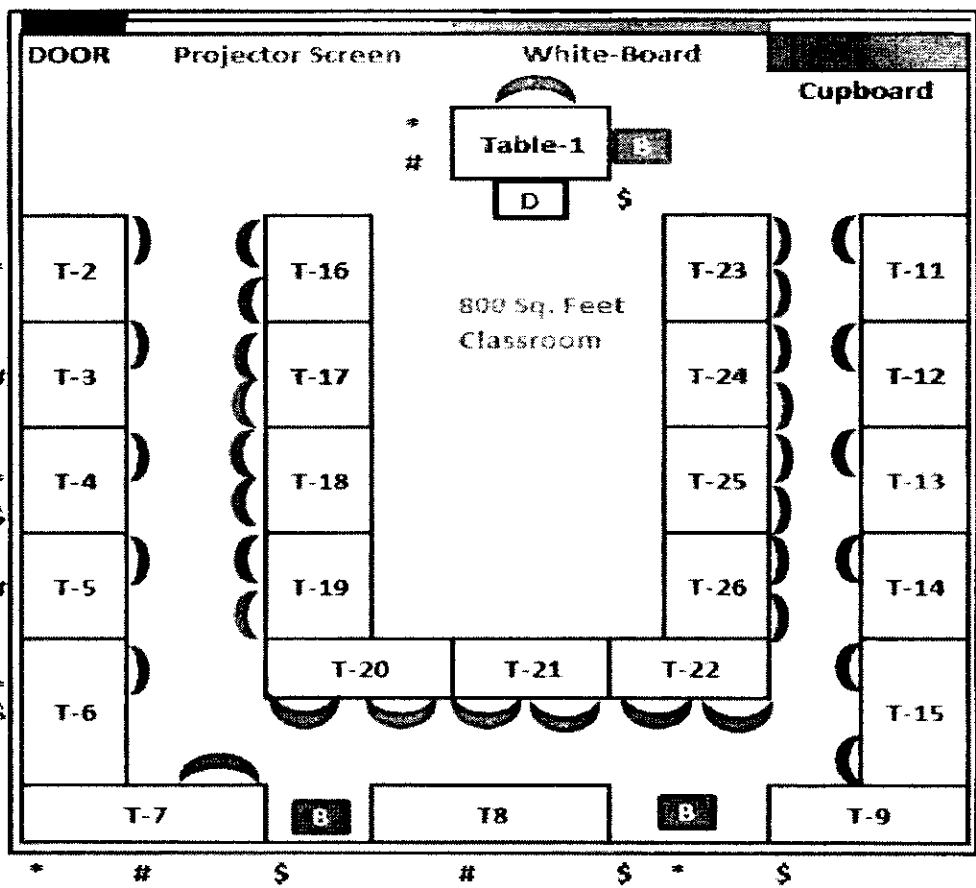
S. No.	Item / Work description	Qty. & Specification
1	Wooden Tables	26 Qty. Wooden tables with rubber bushing (Grey coloured with hole for cables)
2	Executive Chairs	26 Nos. Executive Chairs preferably blue colour.
3	Heavy Duty Trolley	1 Qty Capable of carrying kit weight of Max 50Kg.
4	Table for LCD Projector	1 Qty, to be located near the trainer's table if provision for ceiling mount is not available
5	Sliding White-Board	1 qty. (6' X 4')
6	Sliding Projector-Screen	1 qty. (6' X 4')
7	LCD Projector	1
8	UPS back up for all Work stations & Training Kits	To be arranged by the institute
9	Electric Cabling from UPS to all Work Stations, Switches, & Projector	5 amp , 3 points for each work station

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10	Electric Cabling from UPS to all Kits (1-Phase points (230v/50Hz))	8 Points of 4 x 3 pin Sockets
11	3-Phase points (3ph-415v/50 Hz)	8 Points with round socket (6 A MCB with Each Socket)
12	Power point for LCD projector	5amp point to be provided near the LCD projector table.
13	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station
14	Networking for Work stations And Kits	CAT 6 cable
15	LAN Connections	14 Nos. (5 for Kits, 7 for Student Workstations & 2 at Trainer table) Refer layout for locations
16	Air-conditioners	Adequate to maintain 22°C - 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant

Confidential

17	<p>Motor Mounting Foundation</p>	<p>A concrete foundation block for 130/160 frame Motor. Foot mounting for 3x motors Each Foundation of 2' (B) x 3' (L) x 1' (H)</p>
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Confidential

Furniture		H	L	D
T1	Front Wooden Covering	2.5'	5'	2'
T2-T15	No Covering	2.5'	4.5'	1.5'
T16-T23	Front Wooden Covering	2.5'	5'	2'
D	Movable trolley	2'	2.5'	2'
\$	3-Phase Power Supply 415V AC / 50 Hz for Kits			
*	1-Phase power Supply 230 V AC /50Hz for Kits			
#	WorkStation and its power supply			
B	Concrete foundation for Foot Mounting motor			

Confidential

6.8 Process Instrumentation Lab

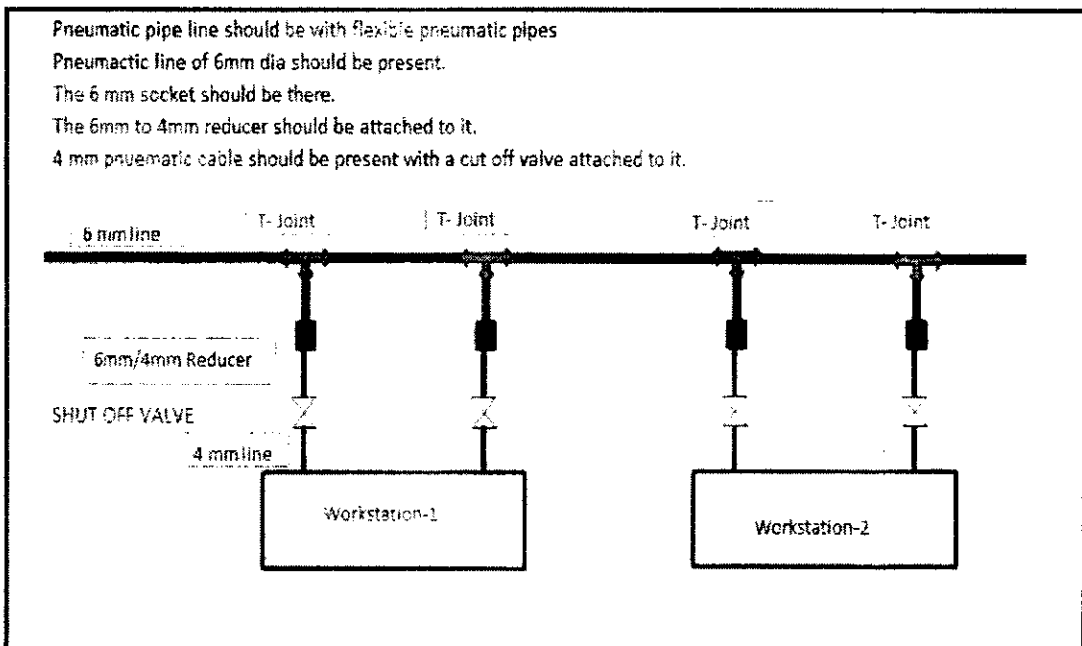
S. No.	Item / Work description	Qty. & Specification
1	Wooden Tables	22 Qty. Wooden tables with rubber bushing (Grey coloured with hole for cables)
2	Executive Chairs	26 Executive Chairs preferably blue colour.
3	Heavy Duty Trolley	1 Qty Capable of carrying kit weight of Max 50Kg.
4	Table for LCD Projector	1 Nos, to be located near the trainer's table if provision for ceiling mount is not available
5	Sliding White-Board	1 qty. (6' X 4')
6	Sliding Projector-Screen	1 qty. (6' X 4')
7	LCD Projector	1
8	UPS back up for all Work stations & Training Kits	To be arranged by the institute
9	Electric Cabling from UPS to all Work Stations, Switches, & Projector	5 amp , 3 points for each work station
10	Electric Cabling from UPS to all Kits (1-Phase points (230v/50Hz))	8 Points of 2 x 3 pin Sockets (1.0 Ampere totally per point)
11	3-Phase points (3ph-	2 Points with round socket (6 A MCB with

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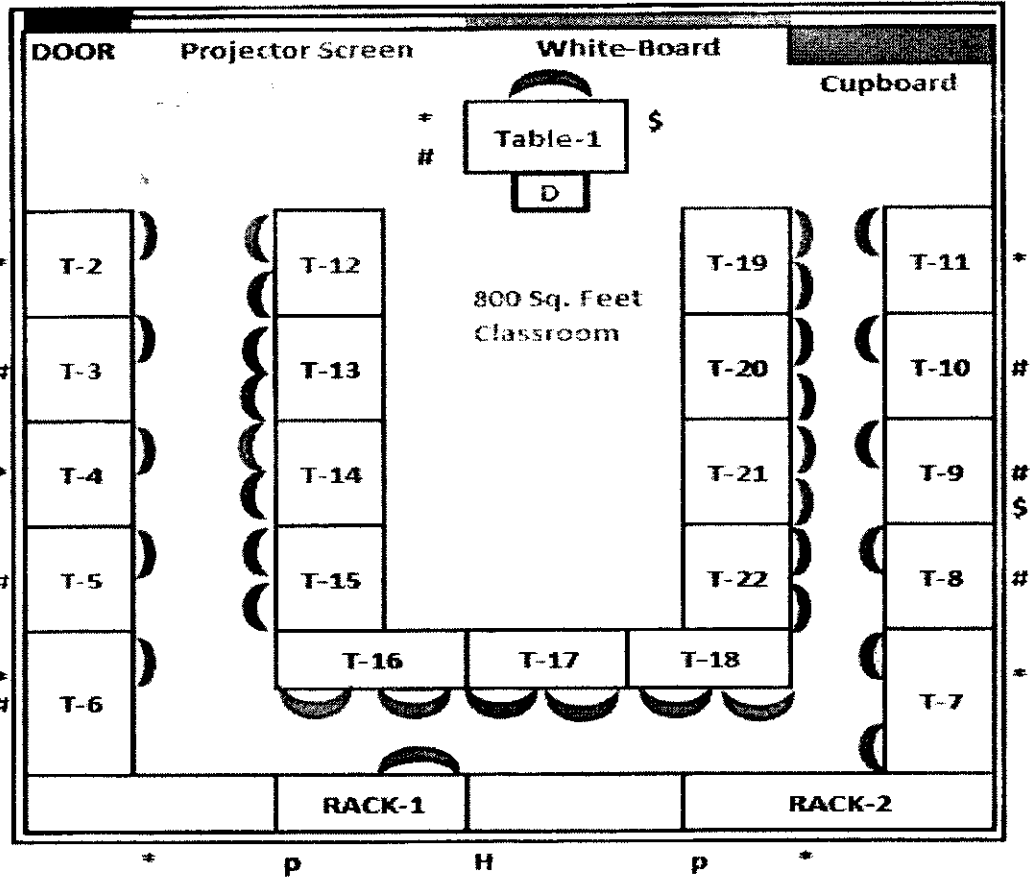
	415v/50 Hz)	Each Socket)
12	Power point for LCD projector	5amp point to be provided near the LCD projector table.
13	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station
14	Networking for Work stations And Kits	CAT 6 cable
15	LAN Connections	9 Nos. (2 for Kits & 7 for Workstations) Refer layout for locations
16	Pneumatic (Air-Pipeline) 7-Bar (7-Bar pressure with FRL unit)	Filter Regulator Lubricant will be supplied Pneumatic line to be made by institute (Refer diagram)
17	Pneumatic Sockets	2nos Refer Diagram
18	1" Water Pipeline with Collar fitting of 2.5'.	1 Point This could be normal working line only for the purpose of mounting flowmeter. Refer https://www.youtube.com/watch?v=4lXuy7yG_s for clear information.

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19	Air-conditioners	Adequate to maintain 22°C - 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant
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Confidential

Furniture		H	L	D
T1	Front Wooden Covering	2.5'	5'	2'
T2- T11	No Covering	2.5'	4.5'	1.5'
T12- T19	Front Wooden Covering	2.5'	5'	2'
D	Movable trolley	2'	2.5'	2'
\$	3-Phase Power Supply 415V AC / 50 Hz for Kits			
*	1-Phase power Supply 230 V AC /50Hz for Kits			
#	WorkStation and its power supply			
p	Pneumatic Connection			
H	Water Line of 1 inch Near each rack of about 2.50'			

Confidential

6.9 Mechatronics Lab

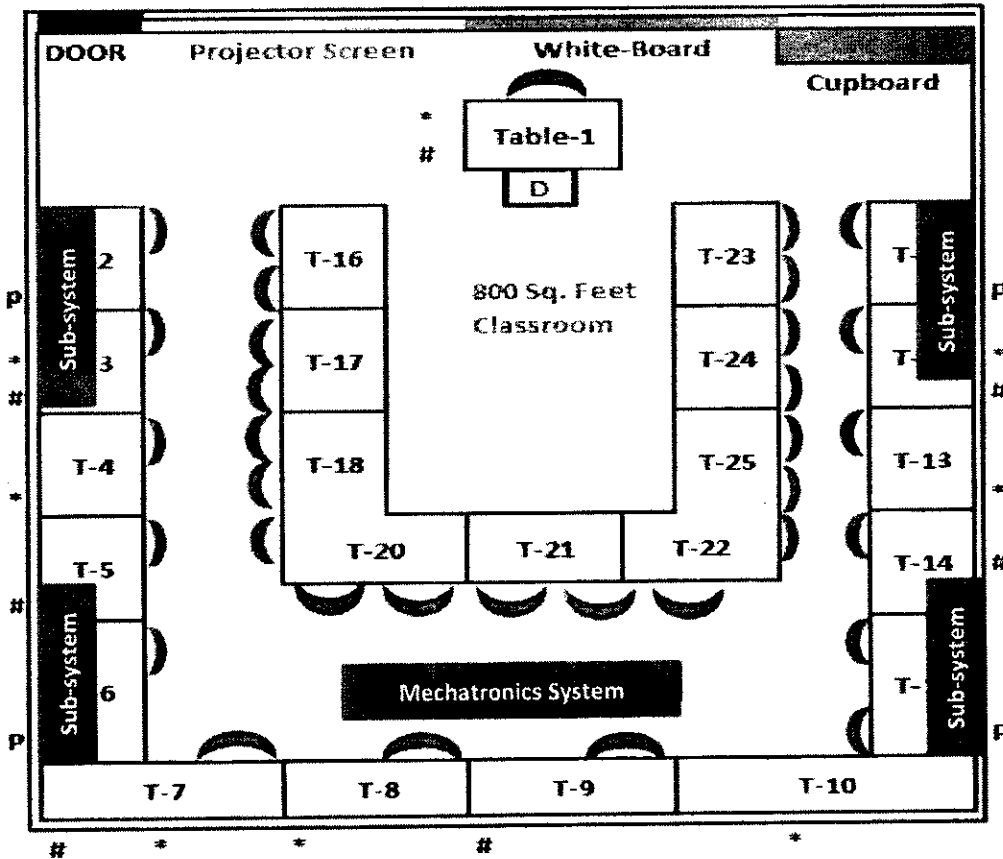
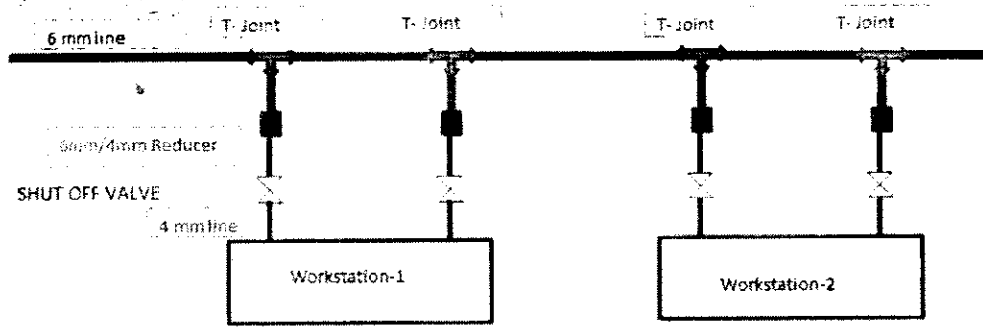
S. No.	Item / Work description	Qty. & Specification
1	Wooden Tables	26 Qty. Wooden tables with rubber bushing (Grey coloured with hole for cables)
2	Executive Chairs	26 Nos. Executive Chairs preferably blue colour.
3	Heavy Duty Trolley	1 Qty Capable of carrying kit weight of Max 50Kg.
4	Table for LCD Projector	1 Qty, to be located near the trainer's table if provision for ceiling mount is not available
5	Sliding White-Board	1 qty. (6' X 4')
6	Sliding Projector-Screen	1 qty. (6' X 4')
7	LCD Projector	1
14	UPS back up for all Work stations & Training Kits	To be arranged by the institute
15	Electric Cabling from UPS to all Work Stations, Switches, & Projector	5 amp , 3 points for each work station
16	Electric Cabling from UPS to all Kits (1-Phase points (230v/50Hz))	5 Points of 2 x 3 pin Sockets (1.0 Ampere totally per point)

Confidential

17	Power point for LCD projector	Samp point to be provided near the LCD projector table.
18	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station
19	Networking for Work stations And Kits	CAT 6 cable
20	LAN Connections	12 Nos. (6 for Kits & 6 for Workstations) Refer layout for locations
22	Pneumatic line sockets	8 points. See Note given below
23	Air-conditioners	Adequate to maintain 22°C - 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant

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Pneumatic pipe line should be with flexible pneumatic pipes
 Pneumatic line of 6mm dia should be present.
 The 6 mm socket should be there.
 The 6mm to 4mm reducer should be attached to it.
 4 mm pneumatic cable should be present with a cut off valve attached to it.



Confidential

Furniture			H	L	D
T1	Front Wooden Covering		2.5'	5'	2'
T2-T15	No Covering		2.5'	4.5'	1.5'
T16-T23	Front Wooden Covering		2.5'	5'	2'
D	Movable trolley		2'	2.5'	2'
\$	3-Phase Power Supply 415V AC / 50 Hz for Kits				
*	1-Phase power Supply 230 V AC /50Hz for Kits				
#	WorkStation and its power supply				
p	Pneumatic Connection - 2 Socket per Press				

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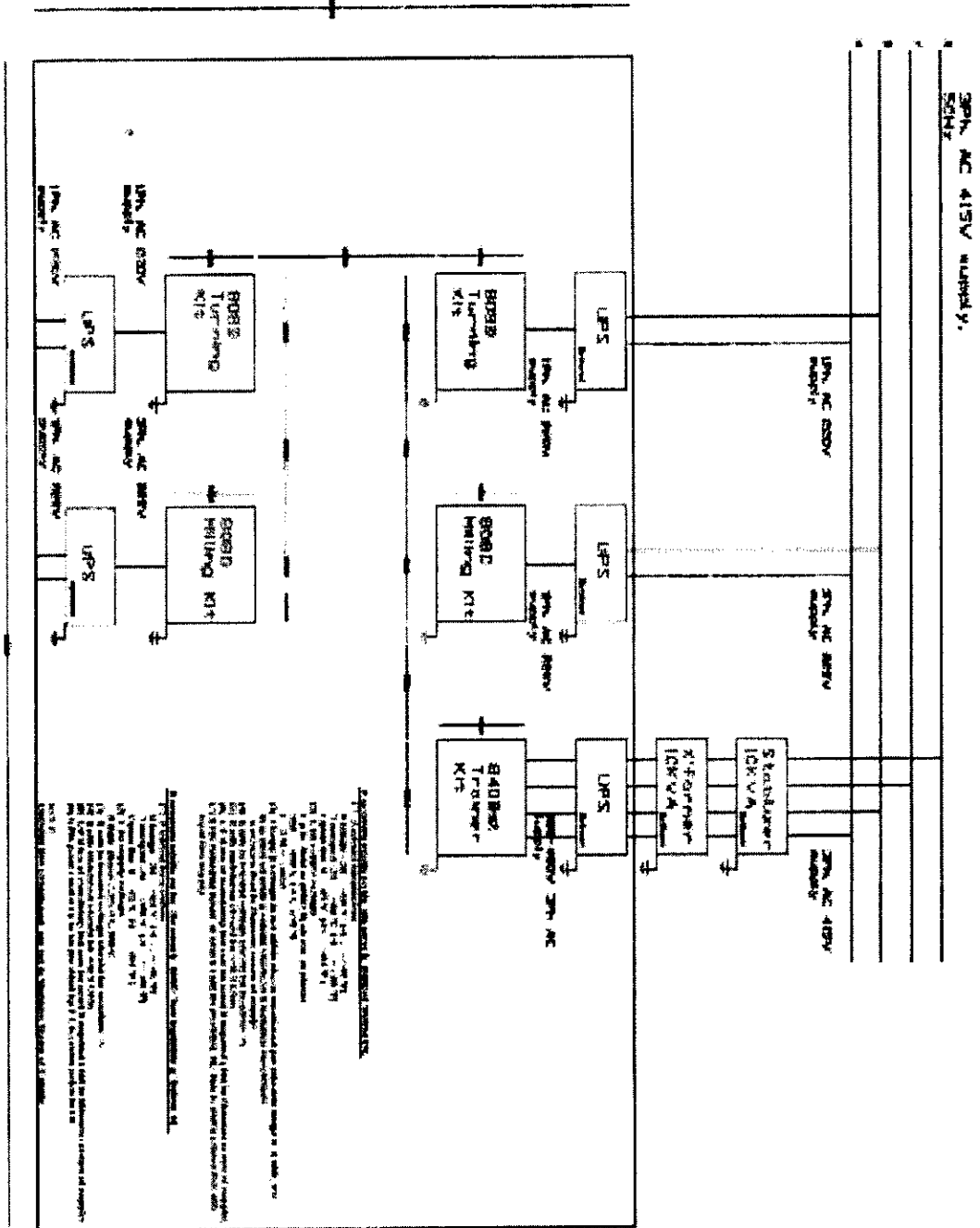
6.10 Advanced Machine and Robotics Lab

6.10.1 CNC Programming Lab

S. No.	Item / Work description	Qty. & Specification
1	Room Size	L x W x H :: 30' x 20' x 10'
2	Wooden Tables	4 Nos. Size 3' x 3', Wooden tables with rubber bushing
3	Table & Chair for trainer	1 Qty.
4	Table for LCD Projector	1 Qty required if wall mount of projector is not available. To be located near the trainer's table.
5	Sliding White-Board	1 Qty., 6' x 4'
6	Remote Controlled Sliding Projector-Screen	1 Qty., 6' x 4'
7	Executive Chairs	24 Nos.
8	LCD Projector	1
9	Power point for LCD projector	5amp point to be provided near the LCD projector table.
10	Cable for connecting Projector and Trainers Work station	Adequate cable length for connecting Projector and Trainers Work station

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11	1-Phase points (230v/50Hz) with UPS backed up	At Trainer table (3 Sockets), Projector(1 Socket) & Computers (4 x 3 Sockets)
12	1-Phase points (230v/50Hz) UPS backed up	Please refer attached Layout
13	3-Phase points (3ph-415v/50 Hz)	Please refer attached Layout
14	LAN Connections	7 Points (1 near to 840DSL kit + 2 at trainer table + 4 Students Workstation)
15	AC is required for this lab	Adequate to maintain 22°C - 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant
16	Stabilizer & Isolation Transformer	10 KVA for the 840 DSL Kit One for the 840 DSL Kit



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6.10.2 Rapid Prototyping

S. No.	Item / Work description	Qty. & Specification
1	Entrance / Pathway to the lab	Height 10' , Width 5'
2	Room Size	L x W x H :: 15' x 15' x 10'
3	Space for Support removal Tank	Outside the Lab (space required 5' x 5')
4	Strong Table W x D x H for RP machine	40" x 48" x 30"
5	Table & Chair for computer	1
6	Forklift	Need Forklift for moving the RP machine to the required location. The machine needs to be handled vertically. Weight of M/c 200kg
7	Flooring	No carpets to be used
8	Open Storage Rack D x W x H	2' x 4' x 6', with shelf at a height of 2' for keeping raw material
12	UPS Power Supply to RP Machine	1 Ph. 3KVA Online UPS with min. 2 hrs. backup

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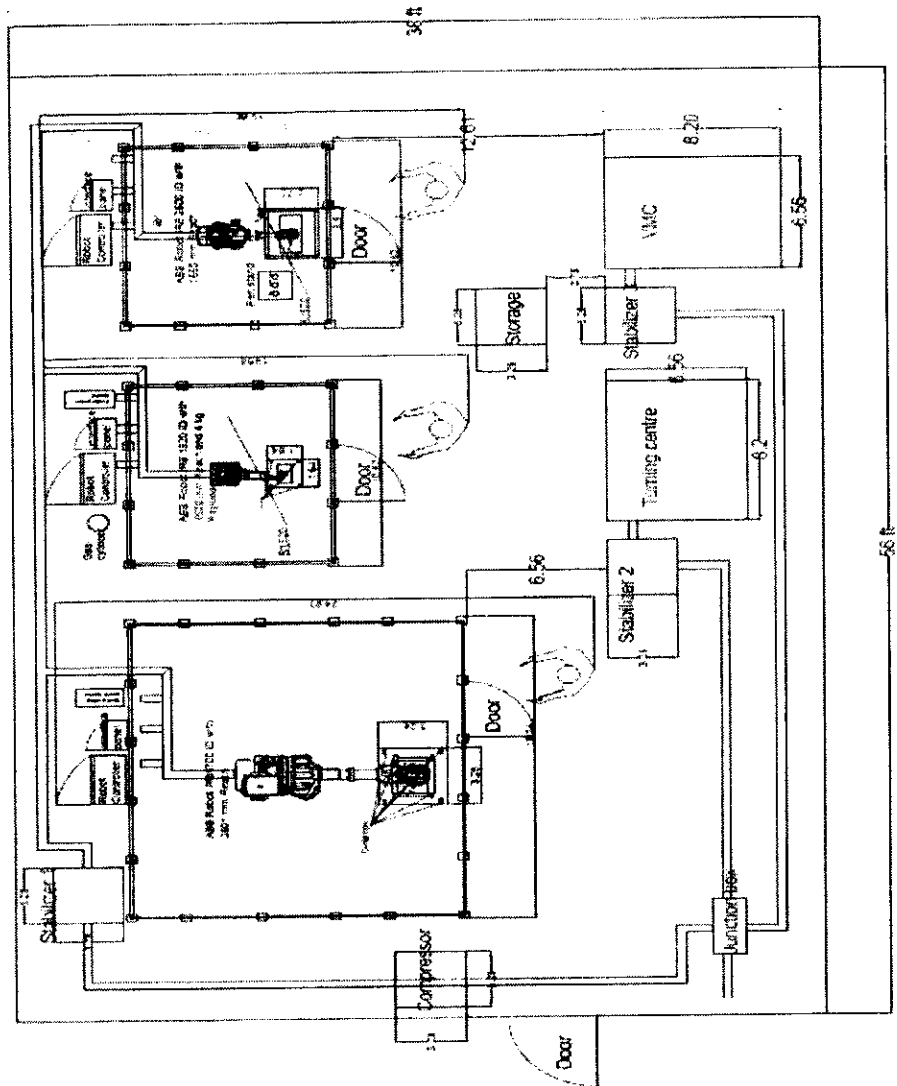
13	Single Phase UPS back up power point	15 / 5 amp socket for RP machine
14	Single Phase UPS back up power point for Work Station	5A , 3 sockets for CPU
15	Raw Power Supply for Support removal tank	15A, Single Phase Socket should be provided outside the Lab
16	LAN	2 points, one near to Workstation & another near to RP system.
17	De-Humidifier	Has to be within 20% to 40% non-condensing In case of High Humidity , De-Humidifier has to be provided by the Institute
18	Air Conditioning	Adequate to maintain 22°C - 26°C temperature in the Lab, depending upon the actual room size. The exact rating needs to be discussed with an AC consultant

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6.10.3 CNC & Robotics

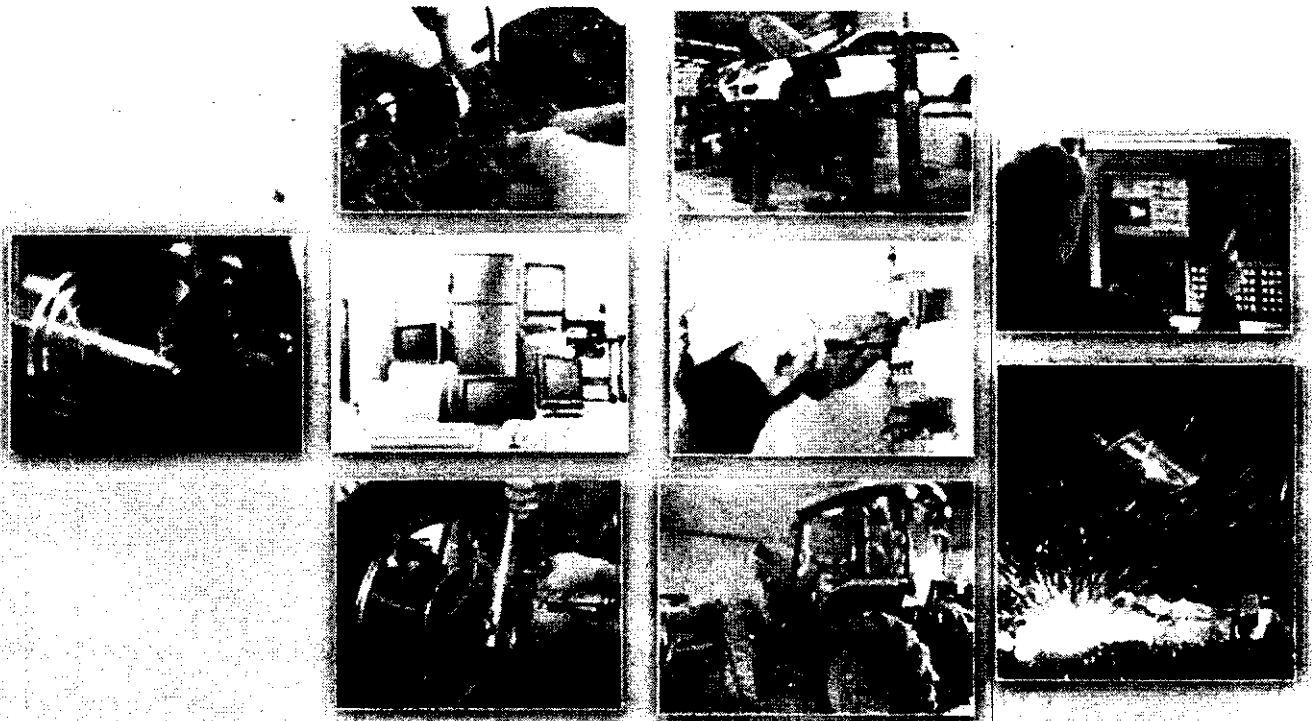
S. No.	Item / Work description	Qty. & Specification
1	Height of the room	16ft- 18ft, ground floor
2	Power supply capacity	180 KVA
3	Ambient temperature	0~45 degree
4	Ambient humidity	Normally 75%RH or less (No dew allowed) Short term (within one month) 95%RH or less (No dew allowed)
5	Vibration	0.5G or less
6	Installation Floor	The installation floor of equipment has to be reinforced concrete of more than 200mm thickness, with provision for foundation bolts for robot mounting
7	Power Supply	AC 400V , 3 ϕ +E (variation within +/-10V)
8	Electrical Work	To be done as per requirement – Shall depend on actual space allocated
9	Pneumatic lining	To be done as per requirement – Shall depend on actual space allocated

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Total Area 56 x 38 ft
All dimensions are in feet

All requirements specified as part of Institute scope are subject to change as per actual site allocation. A detailed specification shall be made once sites are finalized



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Volume 4

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7 Institute requirements for t-SDI to be provided by the Institute/ APSSOC

7.1 Summary

Labs in t-SDI:

S.no	Lab	Area (sft)	Power Consumption
1	4 Wheeler Lab	2200	15 KVA
4	2 Wheeler Lab		15 KVA
5	Home & Industrial Electrical Lab	1800	5 KVA
6	Refrigeration & Air conditioning Lab		17 KVA
8	Home Electronics Lab	1400	3-5 KVA
9	ICT Lab		
10	CNC Lab	1600	40 KVA
11	Welding Lab	1000	
12	Agriculture Lab	2000	20 KVA

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7.2 Requirements

- **Built-up Area:** The Siemens t-SDI requires 10,000 sq ft in the Institute premises. Out of which 5800 sq ft is required on the ground floor.
- **Civil Infrastructure:** All required civil infrastructure for the labs including flooring, partitioning, false ceiling and other equipment specific civil work needs to be carried out by the institute.
- **Electrical:** 3 phase, 320 KVA transformer rating, Commercial/ Industrial Panels required.
- **Site preparation:** 3-phase electrical supply points, pneumatic lining and hydraulic piping where required.
- **Facilities:** Furniture, Air conditioning, Smart-boards/Projectors, PA System and LAN Networking in the areas indicated to be provided by the college
- **UPS & DG set:** UPS back-up and DG set is required to ensure continuous operation of the facility
- **Ancillaries** required to supplement the labs for each trade which are in the Institute or APSSDCs Scope
- Industrial Wall mounted fans
- Epoxy Flooring (recommendation : Pidilite)
- 3 phase power connection
- Furniture for class room
- Partitioning between the labs if required
- False ceiling in labs like electrical, RAC and electronics
- DG Set / Power backup
- Work benches (2.5 X 4.5 ft.)

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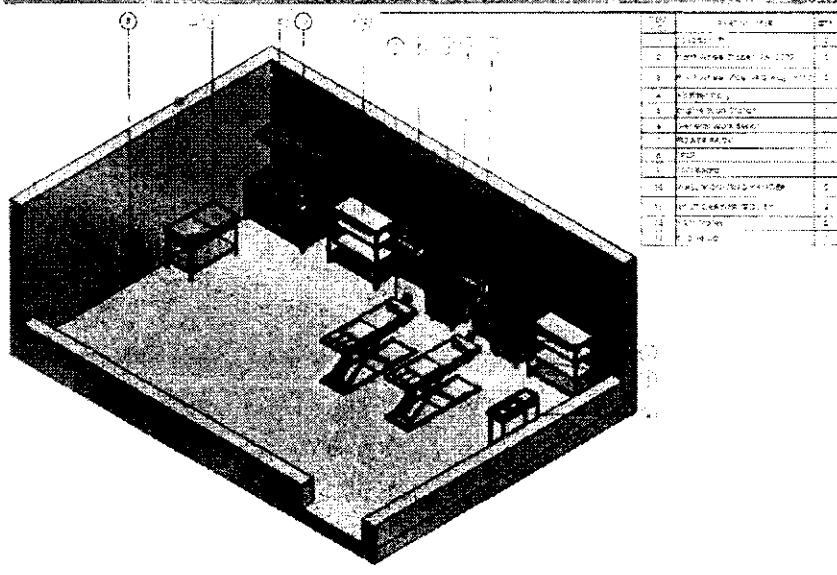
- Concrete shelves
- Concrete slabs for mounting the machines where required
- Rubber mats for concrete shelves
- Pneumatic Lining
- 6 core Copper cables for electrical cabling with proper shield and armor & with earthing provision
- Work station tables
- LAN Network along with networking
- Bay markings on the floor
- Table & Chair for trainer

All requirements specified as part of Institute scope are subject to change as per actual site allocation. A detailed specification shall be made once sites are finalized.

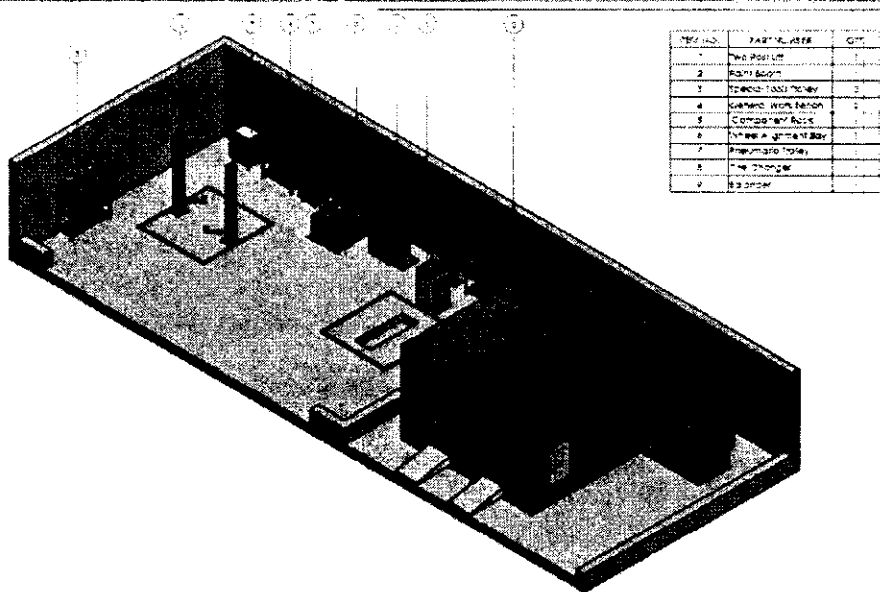
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7.3 Recommended Layouts

7.3.1 2-Wheeler

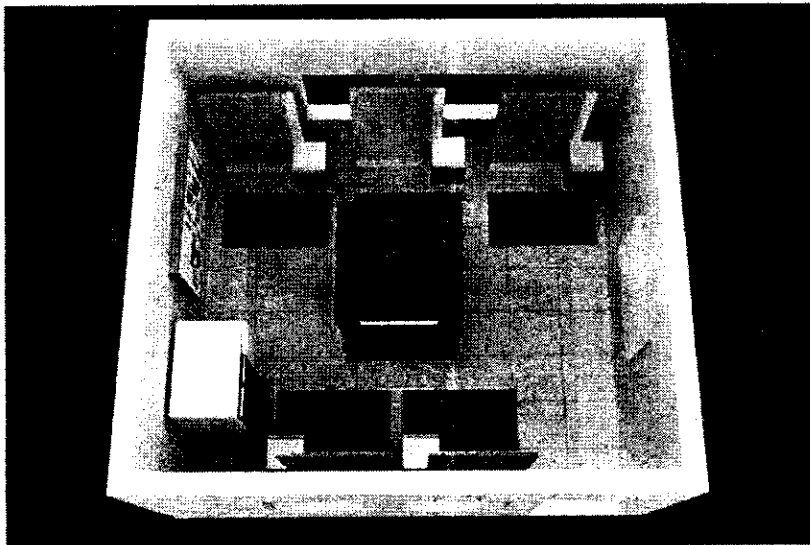
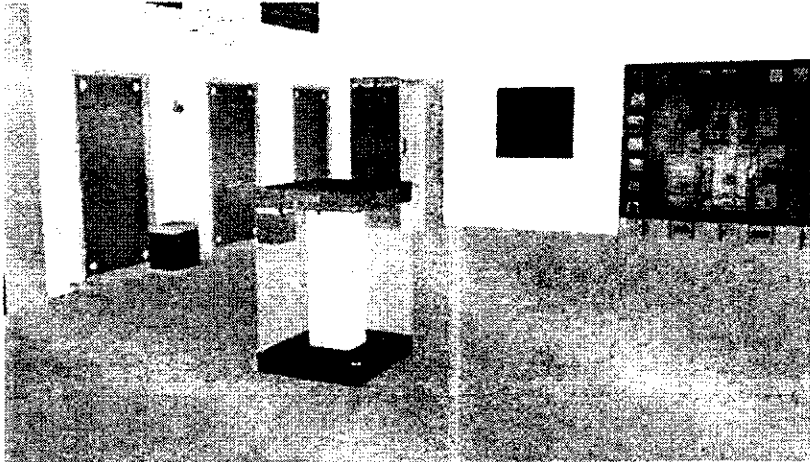


7.3.2 Four Wheeler



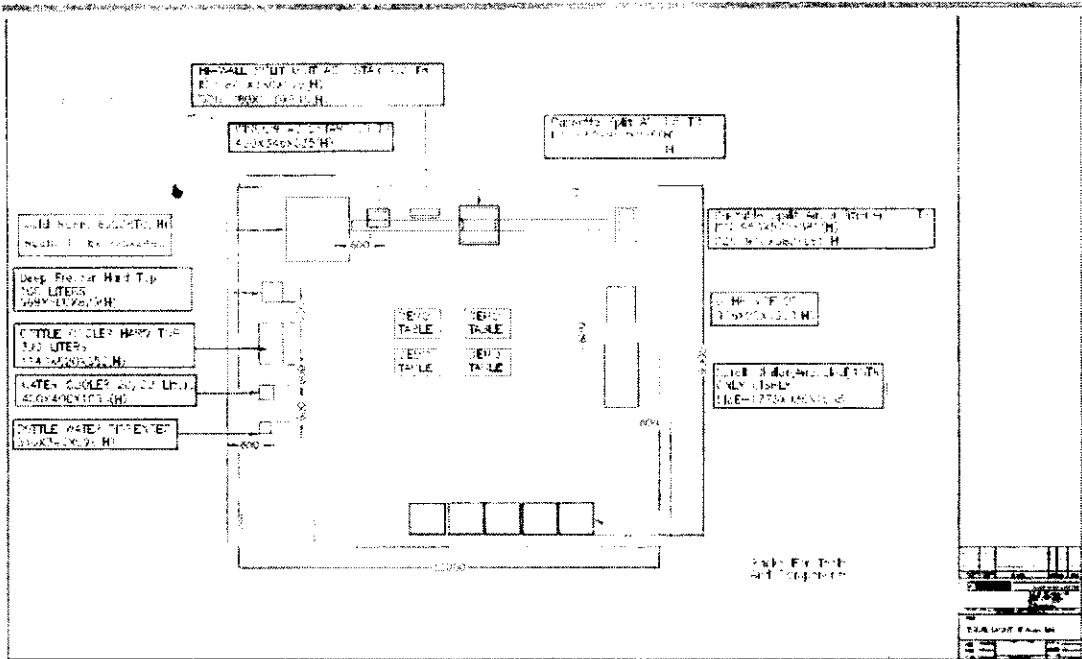
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7.3.3 Electrical Home



Confidential

7.3.4 RAC



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Learning Tracks for Auto Body Repair

AUTO BODY REPAIR			
Measuring Instruments & General Tools	Workshop safety & Tools for 4 wheelers	Assistant 4 wheeler Mechanic Course	Basic Automotive Servicing (4 wheeler)
Tools & Equipment			
Usage	Care & Maintenance		
Introduction			
Types of body & panels		Function of body & panels	
Inspection Procedure			
Panels	Doors	Other body parts	
Removing & refitting of body components			
Panels	Doors	Other body parts	
Arc welding	Gas welding	Resistance welding process	Mig welding
Wind screen glass			
Repair Procedures			
MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS

Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Energy Lab

Energy Management Lab			
Basic Power System & Protection	SIRIUS Motor Management Systems (SIMOCODE)	PAC Meter	SINAMICS G120 drive system
Basic Of power distribution	SIMOCODE PRO	PAC 3100	Basics of energy management
Philosophy of Generation, distribution in LV, MV & HV	Basics of energy management	PAC 3200	Energy Management Solutions
Types of network	Energy Management Solutions	PAC 4200	PAC Meter
Faults & Fault level calculations	PAC Meter	Introduction to Powerconfig	Integration with automation system
Basic Of protection			Introduction to report management
Types of Fault			Introduction to power manager software
Power products range overview			
Simaris Curve simulation			
MANDATORY	OPTIONAL	SPECFIC USERS	TRACKS

Confidential

CNC Programming and Operations
Introduction to CNC
Actuation systems
Modes of machines operations - Manual, MDI & Automatic
Programming procedure/ Co-ordinate system
Advantages & disadvantages of CNC, Differences in NC & CNC Machine, Symbols Used
Introduction to programming using G Code & M Code listing
CNC Structure, DNC, offsets and forms of compensation
Tooling and Indexing system
Sinutrain Operate & Sinumerik - 808 (Milling/ Turning)
CAD & CAM - Basic Training
CAM - Advance Training

MANDATORY

OPTIONAL

SPECIFIC USERS

TRACKS

Learning tracks start from the top and progress downward.

Confidential

CNC Machine Lab	
Machinist & Milling	Turner

Basic tools and information	
Safety precautions	
Basic information of machine tools & parts	
Making jobs within accuracy & how to cut	
Using measuring instruments & Operating the milling machine	Using measuring instruments & Operating the lathe machine
Accuracy in angular & fitting jobs within a tolerance level	Filing/ Turning/ Drilling/ Reaming Operations
Indexing, cutting & slitting operations	

Confidential

Learning Tracks for Robotic & CNC Machine Lab

Robotic Lab		
Robotic Pick & Place	Robotic Arc Welding	Robotic Spot Welding
Introduction to Industrial Robots & Robotic Applications		
Safety & precautions while operating a Robot		
Robot Controller/ PLC Operations		
BUS Configuration & Robot I/Os		
Basic Maintenance & Repair activities		
Robotic Cell Creation		
Robotic Teach Pendant Programming		
Robotic Offline Programming using RobCAD/ PS Robotics		
Robotic Material Handling Application Training	Robotic Arc Welding Application Training	Robotic Spot Welding Application Training

Confidential

Learning Tracks for Mechatronics Lab

Mechatronics Lab

Basic Mechatronics

Introduction to the module	Fundamentals of Electrical Components	Mechanical Components	Pneumatic Components	Interpretation of Technical Documents	Digital Fundamentals & PLC
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MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Process Instrumentation Lab

Process Instrumentation Lab

Basic of Process Instrumentation SIMATIC PCS 7 Basics

FLOW measurement	LEVEL measurement		Introduction to standard architecture of PCS 7	Introduction to Automation System Hardware
PRESSURE Measurement	TEMPERATURE Measurement	ELECTROPNEUMATIC POSITIONER	Working with SIMATIC Manager in PCS 7 way	Creating the project and Configuring Hardware's (AS & OS)
				Working with Plant Hierarchy

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Electrical Lab

Electrical Lab			
Basic Course on AC - DC Drives	Basic Power Systems	Basics of Induction Motors	Low Voltage Switch gear
DC Motor Basics	Basic Of power distribution	Basics of Electricity	Smarts Curve simulation
DC Drives Basics	Philosophy of Generation, distribution in LV, MV & HV	Efficiency of induction motor- various losses in the induction	Low Voltage offerings in Power Distribution in industry today
Siemens DC Drives (6RA80)	Types of network	Product spectrum of Siemens motor	DIN Fuse - Importance of fuses
AC Motor Basics	Faults & Fault level calculations	Advance control of induction motor- SIMOCODE overview	Overview of Pac meter
AC Drives Basics	Basic Of protection	Speed Torque Characteristics, Effects of supply variations over the motor performance	Overload Relay, Microprocessor Relay
AC Drives (Sinamics S & G)-Ratings	Types of Fault		
MEDIUM VOLTAGE			
MV Transformers			

MANDATORY

OPTIONAL

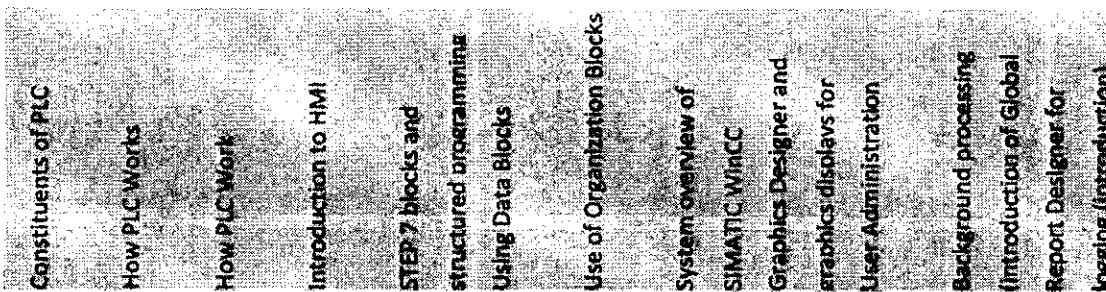
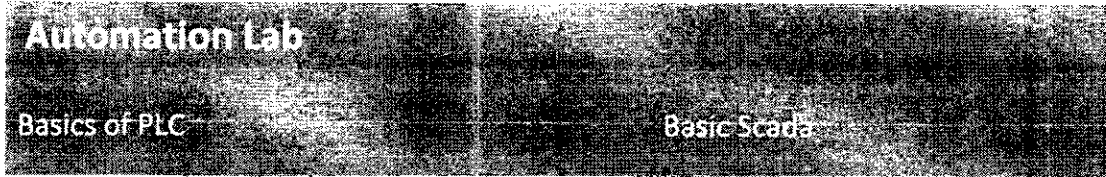
SPECIFIC USERS

TRACKS

Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Automation Lab



Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for LMS Virtual. Lab

LMS Virtual.Lab

Motion Durability	Acoustics Noise & Vibration	Correlation & Updating	Optimization
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LMS Virtual.Lab Motion - 3D Dynamic Simulation using multibody simulation	LMS Virtual.Lab Acoustics - Acoustic Simulation in FEM	LMS Virtual.Lab Correlation - Insight to Improve Test & Simulation processes
	LMS Virtual.Lab Acoustics - Advanced Techniques & Methods in FEM	
	LMS Virtual.Lab Noise & Vibration - NVH System Simulation	
	LMS Virtual.Lab Acoustics - Ray Tracing Applications	

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for LMS Test. Lab

LMS Test. Lab

Structures & GVT Structural Dynamics Testing	Acoustics & General Dynamics Data Acquisition	Rotation & Turbine Testing	Vibration Control, Environmental Testing & Durability Engineering
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LMS Test.Lab Structures - Model Testing and Analysis	LMS Test.Lab Acoustic Testing and Analysis	LMS Test.Lab Rotating Machinery - Basics (Understanding the dynamic 'Signature' of your system)	LMS Test.Lab Environmental Testing - Vibration Control
LMS Test.Lab Structures - Model Testing and Analysis Advanced	LMS Test.Lab Sound Quality Testing and Engineering	LMS Test.Lab Rotating Machinery - Advanced (Angle Domain Processing)	LMS Test.Lab Environmental Testing - Vibration Control
	LMS Test.Lab Transfer Path Analysis - Insights Into System Dynamics with Test - Based Engineering		LMS Test.Lab Road Load Data Acquisition
			LMS Test.Lab Basic -- Load Data Processing

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACK
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Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for LMS Imagine. Lab

LMS Imagine. Lab			
Landing Gear	Environmental Control Systems	Engine Equipment	Power & Distribution Networks

<p>Model Based System Engineering: Getting started with LMS Imagine.Lab</p> <p>Introduction to Hydraulic System Simulation with LMS Imagine.Lab</p> <p>LMS Imagine.Lab - Model Optimization</p> <p>Advanced Hydraulic System Simulation with LMS Imagine.Lab</p> <p>LMS Imagine.Lab - the AMESet Development Tool for the development of custom sub models</p> <p>2D and 3D multi body system modeling with LMS imagine.Lab</p>	
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Cooling Systems Simulation with LMS Imagine.Lab
Thermal Fluid System Simulation with LMS Imagine.Lab
Heat Exchanger Modeling and Analysis for Auto, Off-Highway and Aircraft Applications

<p>Two-phase Flow and Refrigerant Loop Systems applied to Air Conditioning System Design with LMS Imagine.Lab</p>	<p>Internal Combustion Engine Simulation with LMS Imagine.Lab</p>	
LMS Imagine.Lab - Environmental Control Systems		

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Confidential

Learning Tracks for PLM

Product Lifecycle Management (PLM)											
PLM Usage							PLM Administration				
PLM Author	PLM Consumer	PLM CAD User	PLM Project Management	PLM Requirements Management	PLM Manufacturing	PLM Assembly Planning	PLM Manufacturing Part Planning	Visualization Analyzer	Installation	Administration	Customization

Using Teamcenter	Introduction to Teamcenter					Mockup	Introduction to Teamcenter	Using Teamcenter
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Integration for NX Users	Schedule Manager	Managing Requirements using Teamcenter	Assembly Process Planning	Assembly Part Planning
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Installation	Application and Data Model Administration
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Managing Systems Design using Tc

Advanced Workflow and Security Administration
Customization

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Learning tracks start from the top and progress downward.

Confidential

Robotics			Simulation	
Spot Welding	Paint Automation	Arc Welding	Plant Simulation	
RobCAD Basics			Plant Simulation Methods, and Strategy	
RobCAD Spot	RobCAD Paint	RobCAD Arc	Plant Simulation Adv Modelling	Plant Simulation 3D Visualization
RobCAD Adv Modelling & Kinematics				
RobCAD OLP				
MANDATORY		OPTIONAL	TRACKS	

Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Manufacturing

MANUFACTURING					
Process Designer			Process Simulate		
Manufacturing Assembly Process Planner		Body-In-White Process Planner	Part Flow Simulation	Human Simulation	Robotics Simulation
Process Designer Basic			Process Simulate Part Flow	Process Simulate Human Simulation	Process Simulate Basic Robotics
Process Designer for General Assembly	Variant Definition and Application	Process Designer for Body-In-White Processing			Process Simulate Intermediate Robotics
					Process Simulate Advanced Robotics Simulation

Confidential

Learning Tracks for Machining

MACHINING			
Part & Tool Machining			Quality
CNC Programmer Lathe	CNC Programmer Multi-axis	CNC Programmer System Admin	CMM

Essentials for NX Designers	- or -	NX Basic Design	CMM Inspection Programming and Execution Basics
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NX Manufacturing Fundamentals	CMM Inspection Analysis
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Turning Manufacturing Process	Fixed-axis and Multi- axis Milling	NX CAM Customization
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Post Building Techniques

MANDATORY	TRACKS
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Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Tooling

TOOLING		
Mold Designer	Progressive Die Designer	
Essentials for NX Designers		
Sync Mod Fundamentals - or - Sync Mod & Param Design		
Intermediate NX Design and Assemblies		
Mechanical Freeform		

NX Sheet Metal	
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Mold Wizard Design Process	Progressive Die Wizard	
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MANDATORY	OPTIONAL	TRACKS
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Learning tracks start from the top and progress downward.

Confidential

Learning Tracks for Validation

ANALYSIS						
LMS SAMTEC						
Getting started with LMS SAMTEC tea Pipe						
LMS SAMTEC Samcef rotors for rotor Dynamics modelling						
SAMTEC Samcef composites for structural composite damage modelling						
Motion Analyst	Stress Analyst	Strength Analysis	Thermal & Flow Analyst	Dynamic Analyst	Laminate Composites Analyst	Naval Dynamics
Essentials for NX Designers			- or -	NX Basic Design		
Motion Simulation	Advance Simulation Process					
	Introduction to Finite Element Analysis with NX	Advance Simulation Solutions	Thermal and Flow Analysis	NX Response Simulation	Laminate Composites	Introduction to Finite Element Analysis with NX
	NX Nastran Advanced Nonlinear					
	Sensitivity and optimization with NX	Super Element Analysis with NX	Advanced Thermal and Flow Analysis	Advanced Dynamic Analysis with NX		Introduction to Dynamic Analysis with NX
						Advanced Dynamic Analysis with NX
						DDAM Analysis with IXX
MANDATORY		OPTIONAL			TRACKS	

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8.5 Learning Tracks

Learning Tracks for Design

DESIGN					
Mechanical Designer	Industrial Designer	Sheet Metal Designer	Routing Designer	Drafting	Reverse Engineering
Essentials for NX Designers					Imageware Basic Modelling

Or

Sync Mod Fundamentals	- or -	Sync Mod & Parametric Design	NX Basic Design	Imageware Reverse Engineering & Inspection
Intermediate NX Design and Assemblies				Drafting Essentials
Mechanical Freeform		NX Sheet Metal	Routing Electrical	Routing Mechanical
Large Assemblies Management	Industrial Design Using NX		PCB Exchange	Sketching Fundamentals
Product and Manufacturing Information				
MANDATORY		OPTIONAL	SPECIFIC USERS	TRACKS

Learning tracks start from the top and progress downward.

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		CNC System Admin
Tooling	Tool Design	Mold Designer
		Progressive Die Designer
Validation	CAE	Aero Dynamics
		Laminate Composites Analyst
		Dynamic Analyst
		Thermal & Flow Analyst
		Strength Analysis
	Stress Analyst	
	Motion	Motion Analyst
Design	Detailing	Drafting
	Modelling	Routing
		Sheet-metal
		Mechanical
	Concept	Reverse Engineering

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Stage	Phase	Learning Track
Product Lifecycle Management (PLM)	PLM Administration	Customization
		Administration
		Installation
	PLM Usage	Visualization Analyser
		PLM Mfg. Part Planning
		PLM Mfg. Assembly Planning
		PLM Requirements
		PLM Project
		PLM CAD User
		PLM Consumer
PLM Author		
Manufacturing	Simulation	Plant Simulation
	Robotics	Arc Welding
		Paint Automation
		Spot Welding
	Process Simulation	Robotics Simulation
		Human Simulation
		Part Flow Simulation
	Process Design	Body-In-White Process Planner
Mfg. Assembly Process Planner		
Machining	Quality	CMM
	Part & Tool Machining	CNC Programmer Lathe
		CNC Programmer Multi-axis

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8.3 Features

- Standalone executable format for windows platform (Vista, Windows 7)
- User Interface
- FAQ Section
- Help Section
- Navigation help
- Quick Access Menu for Ease of Use
- Logo and branding usage as per Siemens guidelines
- Textual Instructions and guidance
- Voice over in English/or any other regional or international Language
- User Profiling
- User Registration: Details to be captured
- Personal Information,
- Education Qualifications; and
- Professional Experience (if any)
- User Authentication for access to Learning Media
- Tracking and Recording of User Activity on software and Progress
- Capability to Synchronize User List and User Activity records with a central server

8.4 Navigation and User Interface

Broader level course categorization helps for quick navigation.

The course contents are categorized logically for quick & clear understanding.

Allows user to select the specific Solution, Industry or SW features to learn

Gives clear understanding about the content application.

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8.2 SCORM Compliance

All the training material is in conformance with SCORM (sharable content object reference model). SCORM is an international specification for e-learning. It provides sharable content, compatible run-time environment and learning profile. SCORM content can be delivered to learners via any SCORM-conformant Learning Management System (LMS) that uses the same version of SCORM.

Requirement	Explanation	Pod Compliance
Accessibility	Content can be located and accessed from multiple locations and delivered to other locations.	✓
Interoperability	Content operates across a wide variety of hardware, software, operating systems, and web browsers regardless of the tools used to create it and the platform on which it was initially delivered.	✓
Durability	Content does not require modification to operate as versions of software systems and platforms are changed or upgraded.	✓
Reusability	Content is independent of learning context and is able to stand alone. It can be used in numerous training situations or for many different learners.	✓

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8.1.1 Requirement Gathering And Analysis specific to APSSDC courses

This phase broadly covers the steps like Content Analysis, Restructuring and Optimization for CBT. The content provided both exhaustive and extensive needs to be tailored to match the learning objectives of each individual module in an Instructor led class room training mode.

8.1.2 Content Analysis & development

Requirement gathering

Understand as is methodology and develop training approach with subject experts

Develop the contents with subject experts and with industry alliance

Collect and Audit Part files required to develop training

8.1.3 Restructuring

Process the content with industry relevance to accelerates learning effectiveness

Module wise Objective definition and Content development with subject matter experts for each module

8.1.4 Optimization for CBT

Solution architecture

Framework development

Digital Interactive courses including IP (Intellectual Property)

This unique offering is based on “Digital Advanced Interactive System (DAIS)”, a visually interactive learning solution that uses industry standard 3D technologies to simulate real-life experiences. Using multi-physics based simulation technology, the product and process maps are captured to translate engineering and design fundamentals into virtual, real-life simulated, self-directed learning models. These modules are self-paced and need no instructors. Hence they can be used to train a large number of students at the same time.

These modules/CBTs (Computer based trainings) are found useful in corporate training as well as college and vocational training. Since these trainings are visual in nature, they are suitable for school drop-outs and unskilled youth. They can also be easily converted into any regional/international languages.

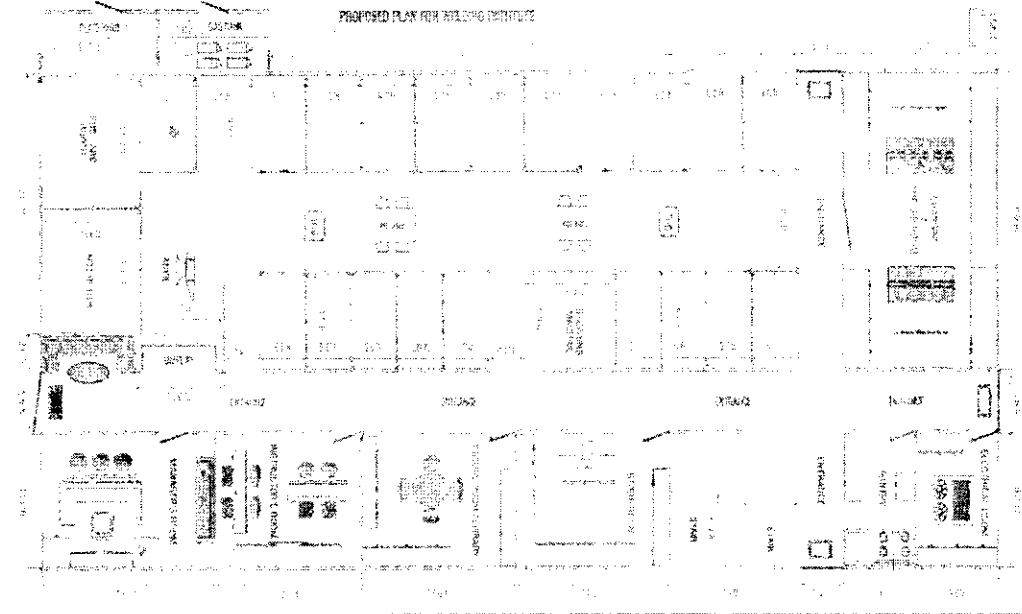
8.1 APPROACH AND METHODOLOGY

The task of development of training is carried out in the following stages/activities:

- Requirements Gathering and Analysis
- Content Development
- System architecture
- User Interface and Navigation
- System Design
- Development Approach
- Testing
- User Acceptance Testing (UAT)

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7.3.5 Welding



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Learning Tracks for Auto Body paint

AUTO BODY PAINT				
Measuring Instruments & General Tools	Workshop safety & Tools for 4 wheelers	Assistant 4 wheeler Mechanic Course	Basic Automotive Servicing (4 wheeler)	Auto Body Repair
		Introduction to body painting		
		Selection of consumable	Material used for painting	
Tools & equipment				

Spray Gun	Air gap design	Different Nozzles	Sanding Equipment
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Application & Inspection

Procedure of Painting

Possible defects in painting objects, causes and its cure

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Learning tracks start from the top and progress downward.

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Learning Tracks for Lift Installation and Repair

LIFT INSTALLATION AND REPAIR		
Basics	Electrical	Lift (Elevator)
Basic Electricity & Safety	Measuring instruments and Electrical Tools	

Electrical Drawing	Basic Electrician
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Junior Elevator Installation

Assistant Elevator Installer

Elevator Installer

MANDATORY	OPTIONAL	SPECIFIC USERS	TRACKS
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Learning tracks start from the top and progress downward.

Industry Courses at Siemens Centre of Excellence

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S. No.	Domain	Course Name	Hours	Curriculum
1	CAD	Essentials for Designers	40	User interface Sketching Shell Datums Blending Chamfers Assembly constraints
2	CAD	Sketcher Fundamentals	16	Sketching in Modelling Sketch task environment Creating sketches Constraining sketches Projecting Offsetting Patterning sketch curves
3	CAD	Synchronous Modelling Fundamentals	10	Modelling modes Switching Modes History-free mode Dimension commands Pattern Face Replace Face
4	CAD	Sheet-metal	25	Documenting design intent

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S. No.	Domain	Course Name	Hours	Curriculum
				Editing parametric models Associative curve operations Blending techniques
5	CAD	Advanced Assembly Design	40	Assembly functions Part Families Top/down assembly Modelling Assembly Arrangements Interpart Modelling Variable and Overflow blends
6	CAD	Drafting Essentials	25	Create and edit drawings Create and edit orthographic section Create and edit symbols Geometric tolerance symbols User-defined view boundaries
7	CAD	Class A Free Form	40	Spline interfaces

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S. No.	Domain	Course Name	Hours	Curriculum
		Modelling		Degree segments and continuity Bridge curves Intersection curves Offset curves Curve Analysis Free Form Surfaces Face Analysis Patch Body
8	CAD	Engine Design	35	Spline review Creating splines Studio splines, Construction and reference geometry Working with raster images Curve tools
9	CAD	Intermediate Design & Assemblies	40	Assembly functions Part Families Top/down assembly Modelling Assembly Arrangements

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S. No.	Domain	Course Name	Hours	Curriculum
				Interpart Modelling Variable and Overflow blends
10	CAE	Advanced Simulation	60	Thermal Simulation Flow Simulation Motion Simulation- RecurDyn Advanced Thermal Simulation Space Systems Thermal Simulation Electronic Systems Cooling Simulation Advanced Durability Motion Flexible Body
11	CAE	Composite & Aero Structure Assembly	40	Laminate Composites FiberSIM Composites SynchroFit Advanced Durability
11	CAM	Manufacturing Fundamentals	25	Mill holes Smooth Face Mill tool

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S. No.	Domain	Course Name	Hours	Curriculum
				<p>paths</p> <p>Avoid tool holder collision</p> <p>Create milling tools and tool holders</p> <p>Mill with a chamfer tool</p>
12	CAM	Turning Manufacturing Process	25	<p>Complete Integrated test cut</p> <p>Probe and finish cut operation in turning</p>
13	PLM	TCUA - Using TC	35	<p>Overview terms and concepts</p> <p>Rich client user interface</p> <p>Locate, view</p> <p>Report on product data</p> <p>Locate and view visualization data</p> <p>Perform basic mark-up</p>
14	PLM	TCUA - Installation	35	<p>Common Licensing Server</p> <p>Corporate server installation</p> <p>File Management System</p>

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S. No.	Domain	Course Name	Hours	Curriculum
				Installation of the Business Modeller IDE Administering the in-production system
15	PLM	TCUA - Integration for NX Users	10	NX data creation Storage, access, edit, and sharing Teamcenter capabilities in NX NX data structure and management Sharing data Working in a shared assignment
16	PLM	TCUA - Data Model Administration	15	Business Modeller IDE process Business objects and properties Lists of values, Options, constants, and rules
17	PLM	TCUA -	40	Business Modeller IDE

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S. No.	Domain	Course Name	Hours	Curriculum
		Application & Data Model Administration		process Business objects and properties, Options, constants, and rules Users, groups, and roles, Data Security
18	DM	Tecnomatix – Process	150	Introduction to the Process Designer interface Working with nodes and creating links Productivity Tools Process Designer environment Searching, Querying, and filtering
19	DM	Tecnomatix – RobCAD	150	Introduction to the Robcad environment Workcell layout, Modelling and kinematics Process design and simulation CAD Integration and

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S. No.	Domain	Course Name	Hours	Curriculum
				transition Arc O/p Paint Spot
20	DM	Tecnomatix – Flow	150	Procedures for basic FactoryFLOW calculations Analysing aisle congestion activity equations and templates FactoryFLOW data structure Layout drawing for analysis Creating routes, Material handling requirements
21	Automation	Basic Automation 1	50	Constituents of PLC How PLC Work SIMATIC S7-PLC
22	Automation	Basic Automation 2	50	Terms in communication RS 232 and RS 485 Profibus – DP

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S. No.	Domain	Course Name	Hours	Curriculum
				Drive and PLC over Profibus DP network PROFINET Communication
23	Electrical	Basic Course on Ac – DC Drives	50	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
24	Mechatronics	Basic Mechatronics	50	Introduction to the module Fundamentals of Electrical Components Mechanical Components Pneumatic Components Interpretation of Technical Documents Digital Fundamentals & PLC

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S. No.	Domain	Course Name	Hours	Curriculum
25	Process Instrumentation	Basic of Process Instrumentation	50	Basics of power distribution Basics of power distribution Moulded case circuit breakers DIN Fuse Pac meter Overload Relay

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8.6 List of Modules

8.6.1 SW Tutorials

S/No	Platform	Course Name	Level
1	CAD	Sketching Fundamentals	Expert
2	CAD	Routing Electrical	Master
3	CAD	Routing Mechanical	Expert
4	CAD	Basic Design	Foundation
5	CAD	Synchronous Modeling and Parametric Design	Expert
6	CAD	Essentials for NX Designers	Foundation
7	CAD	NX Sheet Metal	Expert
8	CAD	Drafting Essentials	Expert
9	CAD	Mold Wizard	Master
10	CAD	Progressive Die Wizard	Master
11	CAD	Large Assemblies Management	Expert
12	CAD	Industrial Design using NX	Expert
13	TC	Tc Vis Variation Analysis	Foundation
14	CAM	Fixed-axis and Multi-axis Milling	Master

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15	CAM	Turning Manufacturing Process	Foundation
16	CAM	NX Manufacturing Fundamentals	Foundation
17	CAM	Mill Manufacturing Process	Foundation
18	TCNO	Classic Jack	Foundation
19	TCNO	Robcad Basics	Foundation
20	TCNO	Robcad Advanced Modeling and Kinematics	Expert
21	TCNO	Process Simulate on Teamcenter Part Flow Simulation	Foundation
22	TCNO	Process Simulate on Teamcenter Basic Robotic Simulation	Foundation
23	TCNO	Process Simulate on Teamcenter Human Simulation	Foundation
24	TCNO	FactoryFLOW	Foundation
25	TCNO	Process Simulate on Teamcenter Advanced Robotics (OLP)	Master
26	TCNO	FactoryCAD	Foundation
27	TCNO	Plant Simulation Basics, Methods and Strategies	Foundation
28	TC	Using Teamcenter	Foundation
29	TC	Teamcenter Project	Foundation

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30	SE	Solid Edge Fundamentals	Foundation
31	SE	Solid Edge Assembly	Foundation
32	SE	Solid Edge Sheet Metal	Foundation
33	TC	Collaboration	Expert
34	CAE	NX Advanced Simulation Processes and Solutions	Expert
35	FE	FEMAP	Expert
36	CAE	NX Flow Analysis	Expert
37	CAE	NX Motion Simulation	Expert
38	CAE	NX Response Simulation	Expert
39	CAE	NX Thermal Analysis	Expert
40	CAE	NX Laminates Composites	Expert
41	CAE	NX Automotive Component Application	Master
42	CAE	NX Process Equipment Application	Master

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8.6.2 Industry Tutorials

Sr. No.	Contents
43	Powertrain design basics – Layout-driven Modeling
	Powertrain Introduction & Process Overview Systems Engineering Approach to Create a Skeleton Capturing Engineering Requirements Implementation of Starter Models
44	Powertrain Components – Initial Concept Design
	Modeling of Cast Parts Modeling of Sheet-metal and other Thin-walled Parts
45	Validating the concept layout
	Basic Measurements Manufacturability Analyses – Draft angles and wall-thicknesses Functional Analysis – Motion Simulation
46	Powertrain Components – Detailed Design
47	Reusing existing designs
	Creating a reusable starter model template Reusing a template skeleton assembly
48	Incorporating Design Changes

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49	Validating the 3D assembly design
	Detect and Resolve Assembly Interferences
	Balancing the Crankshaft with the Optimization Wizard
	CAE Analysis on the Crankshaft
50	Supply Supplementary Topics
	Designing of involute profiles, gears & pinions
51	Powertrain Manufacturing
	Manufacturing a connecting rod die (3-axis machining)
	Machining a Casting (feature-based machining)
52	Vehicle Styling
	Styling from an industrial designer's sketch Styling from a digitized clay model
53	Body-in-White Introduction & Design Process Overview
54	Creating the initial BIW model
	Start Design from Styling Data
	Develop Interface Data & Rough Shape
55	Functional Validation of concept BIW – Tire Envelope
56	Creating detail features –Pads/ Pockets, Flanges, Cutouts, Fillets, Darts & Beads

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57	Manufacturability Validation of BIW Design
	Die-lock check Formability Analysis
58	Creating Assembly structures
	Welding Structural Adhesives
59	Incorporating Design Modifications
60	Additional Projects
	Surface Repair Wave BIW – Fuel Filler Cutout Creating a Trunk Deck Lid Inner Inner B-Pillar Spot Weld
61	Manufacturing Automotive Stampings
	Die Face Planning and Design Die Structure Design CAE analysis Machining

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	Die Structure Validation
62	Capturing design / engineering specs
63	Top-level 3D Skeleton
64	Create placeholder-assemblies with target weights
65	Outer skin design
66	Create the fuselage sub-assembly
67	Creating reusable designs Reusing existing design
68	Analyzing the aerodynamics and strength of a wing-flap
69	Detailed-design of structural components (based on outer-skin)
70	Wire-harness layout
71	Concept Design & Verification
72	Functional verification of the concept Defining & validating kinematics Evaluate different concepts
73	Part modeling & Validation Using the layout to build structural parts Sheet metal (optional)

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74	Assembly modeling
	Creating Assembly constraints
	Design in context
	Checking for collisions
75	Adding smart reusable parts
76	Assembly Validation
77	Drafting
78	Concept Design
79	Designing basic steel structures
80	Designing detailed steel structural components
81	Structural Analysis of a ship section
82	Design validation for moving loads
83	Piping design
84	Managing pipe penetrations
85	Transmission System
86	Hydraulic non ABS DISC-Drum H Circuit Type Brake System
87	Hydraulic non ABS DISC-Drum X Circuit Type Brake System
88	Hydraulic ABS DISC-Drum H Circuit Type Brake System
89	Hydraulic ABS DISC-Drum X Circuit Type Brake System
90	Power Steering System

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91	Front & Rear Axle Suspension System
92	HVAC System
93	Air Intake system (Diesel)
94	Exhaust System (Diesel)
95	Clutch System (Mechanical)
96	Cooling System
97	Differential System (with propeller shaft)
98	Fuel System DI & CRDI
99	Diesel Engine (Direct Injection)
100	Wheels System (Alloy based Tubeless)
101	Transformer (Electrical)
102	Field Tractor Transmission system
103	Field Tractor Engine (water cooled)
104	Field Tractor Steering system
105	Field Tractor Cooling system
106	Field Tractor Fuel system
107	Field Tractor Exhaust system
108	Field Tractor Planetary gear assembly
109	Field Tractor power take off assembly
110	Field Tractor power take off Clutch assembly

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111	Field Tractor Manual Front Wheel Drive System
112	AC/DC Motor
113	Washing machine (Home Appliances)
114	Microwave oven (Home Appliances)
115	Food Processor (Home Appliances)
116	Water purifier (RO) (Home Appliances)
117	Refrigerator (Home Appliance)
118	Air-conditioner (RAC)
119	TV (LCD & LED)
120	All in One (Printer, Scanner, Fax Machines)
121	Mobile (qwerty cellphone and Smart phone)
122	Centrifugal pump
123	Submersible pumps
124	Reciprocating pumps (Hand pump)

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8.6.3 t-SDI Courses

S. No.	Trade	Sector	Level	POD Name
125	Electrical	Electrical	Foundation	Basic Electrician
126	Electrical	RAC	Foundation	Basic Refrigeration & Air Conditioning
127	Electrical	Elevator	Foundation	Junior Assistant – Elevator Installation
128	Electrical	Electrical - Home	Expert	House Wiring
129	Electrical	Electrical - Industrial	Expert	Electrical Winder
130	Electrical	Electrical - Home	Expert	Installation & Repair of Home appliances
131	Electrical	Electrical - Industrial	Expert	Transmission line Tower Erection
132	Electrical	Electrical - Industrial	Expert	Transmission line Stringing
133	Electrical	RAC	Expert	Installation & Maintenance of Air-conditioning - Consumers
134	Electrical	RAC	Expert	Installation & Maintenance of Refrigeration - Consumers

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135	Electrical	Elevator	Expert	Escalator mechanic
136	Electrical	Elevator	Expert	Assistant Elevator Installer
137	Electrical	RAC	Master	Repair & maintenance of Air Conditioner
138	Electrical	RAC	Master	Repair & Maintenance of Refrigerators and Deep Freezers
139	Electrical	Elevator	Master	Elevator Installer
140	Electrical	Electrical - Industrial	Master	Industrial Wiring
141	Electrical	Electrical - Industrial	Master	Cables and Industrial Equipment
142	Electrical	Elevator	Master	Escalator expert mechanic
143	MPF	Fabrication	Foundation	Basic Fitting Work
144	MPF	Fabrication	Foundation	Basic Sheet Metal Work
145	MPF	Fabrication	Foundation	Structural & Pipe Fabrication
146	MPF	Fabrication	Foundation	Welding Foundation level
147	MPF	Manufacturing	Foundation	Machining
148	MPF	Manufacturing	Foundation	Quality Control
149	MPF	CNC	Foundation	Introduction To CNC Technology

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150	MPF	CNC	Foundation	CNC Programming & Machining
151	MPF	Fabrication	Expert	Welding Expert level
152	MPF	Manufacturing	Expert	Milling
153	MPF	Manufacturing	Expert	Turning
154	MPF	CNC	Expert	CNC Turning
155	MPF	CNC	Expert	CNC Milling (VMC/HMC)
156	MPF	CNC	Expert	CNC Machine Tool Maintenance
157	MPF	Fabrication	Master	Welding Master Level
158	MPF	Manufacturing	Master	Miller
159	MPF	Manufacturing	Master	Turner
160	MPF	Manufacturing	Master	Advanced Forging & Heat Treatment
161	Automotive	2 wheeler	Foundation	Basic Automotive Servicing (Motorcycle)
162	Automotive	2 wheeler	Foundation	Basic Automotive Servicing (Scooter & Moped)
163	Automotive	4 wheeler	Foundation	Basic Automotive Servicing(4 Wheeler)
164	Automotive	2 wheeler	Expert	Motorcycle Mechanic

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165	Automotive	2 wheeler	Expert	Scooter /Moped Mechanic
166	Automotive	4 wheeler	Expert	Repair & Overhauling of Chassis system (4 Wheeler)
167	Automotive	4 wheeler	Expert	Automobile Electrical system of 4 wheeler
168	Automotive	4 wheeler	Expert	Automobile Electronic system of 4 wheeler
169	Automotive	4 wheeler	Expert	Auto body repair, denting & painting
170	Automotive	4 wheeler	Expert	Automobile Engine system of 4 wheeler
171	Automotive	2 wheeler	Master	Repair & Overhauling of Scooter / Moped
172	Automotive	2 wheeler	Master	Repair & Overhauling of Motorcycle
173	Automotive	4 wheeler	Master	Repairing of Auto Air Conditioning System
174	Automotive	4 wheeler	Master	Automotive Sensor and Actuator Technology
175	Automotive	4 wheeler	Master	Repair and Overhauling of Engine System (Petrol)
176	Automotive	4 wheeler	Master	Repair and Overhauling of

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				Engine System (Diesel)
177	Automotive	4 wheeler	Master	Transmission systems
178	Electronics	Electronics	Foundation	Basic Electronics
179	Electronics	ICT	Foundation	Repair & Maintenance of Basic Cellular Phone
180	Electronics	ICT	Expert	Installation & Maintenance of DTH System
181	Electronics	Home	Expert	Installation & Maintenance of Home theatre
182	Electronics	Office	Expert	Installation and maintenance of Office Electronic Equipment
183	Electronics	Office	Expert	Installation and maintenance of Office Application Software
184	Electronics	Office	Master	Repair & Maintenance of Electronic Test Equipment
185	Electronics	ICT	Master	Repair & Maintenance of Smart Phones
186	Electronics	Home	Master	Repair & Maintenance of TVs-LCD / LED
187	AgroMachinery	AgroMachinery	Foundation	Maintenance & field

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				operation of Irrigation equipment
188	AgroMachinery	AgroMachinery	Foundation	Basic Tractor Servicing
189	AgroMachinery	AgroMachinery	Foundation	Maintenance & field operation of Seed drills
190	AgroMachinery	AgroMachinery	Expert	Repair & field operation of Tractors
191	AgroMachinery	AgroMachinery	Expert	Repair of Harvesting & Threshing equipment
192	AgroMachinery	AgroMachinery	Expert	Repair & field operation of Tillage equipment
193	AgroMachinery	AgroMachinery	Expert	Repair & field operation of Root Harvesting Equipment
194	AgroMachinery	AgroMachinery	Expert	Repair & operation of Processing Equipment
195	AgroMachinery	AgroMachinery	Master	Overhauling of Tractor
196	AgroMachinery	AgroMachinery	Master	Repair, Maintenance & operation of Power Tiller
197	AgroMachinery	AgroMachinery	Master	Repair, Maintenance & operation of Energy Sources Equipment
198	AgroMachinery	AgroMachinery	Master	Repair, Maintenance & field

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				operation of Planters
199	AgroMachinery	AgroMachinery	Master	Repair, Maintenance & operation of post Harvesting Equipment
200	AgroMachinery	AgroMachinery	Master	Repair, Maintenance & field operation of Combine Harvester
201	All	Engineering Drawing	Foundation	Engineering Drawing