• World Class Infrastructure
• Industry 4.0 Focus
• Highy Subsidized Fees
• Section 8 'Not for Profit' Organisation
• Supported by Ministry of Shipping
• Joint Certificate from Siemens & IRCLASS
• 18 State of the Art High Tech Labs
• Strategically located in Mumbai & Vizag

SKILL DEVELOPMENT PROGRAM

www.cemsindia.org
# SOFTWARE DESIGN CAD/CAM/CAE DOMAIN

<table>
<thead>
<tr>
<th>SOFTWARE</th>
<th>NX-11</th>
<th>TEAMCENTRE-11</th>
<th>TECNOMATIX 14.0.2</th>
<th>ROBCAD 11</th>
<th>CADWIN</th>
<th>SINUTRAIN</th>
<th>PARAMARINE</th>
<th>SAMIN</th>
<th>TIA-PORTAL</th>
<th>STARTER</th>
<th>POWERCONFIG</th>
<th>SIMOCODE PRO</th>
<th>SIMATIC Manager</th>
</tr>
</thead>
</table>

## CAD
- NX-11
- Tecnomatix

## CAM
- Advanced Simulation
- Advanced Manufacturing Process
- Composite Structure & Assembly
- Advanced Finite Element Analysis
- TCUA Using TC
- TCUA Installation
- TCUA Integration for NX users
- TCUA Application & Data Model Administration
- Multi Body Dynamics

## CAE
- Vibration Measurement & Analysis
- Modal Testing & Analysis
- Acoustics Measurement & Analysis
- Acoustics NVH Simulation

## PLM
- TeamCentre

## LMS
- TCUA
- TCUA Application & Data Model Administration
- Acoustics NVH Simulation

## VR
- Virtual Reality

## SOFTWARE
- www.cemsindia.org

---

# COURSES OFFERED BY CEMS

## INDUSTRY 4.0

- Product Twin
- Process Twin

---

# ENGINEERING / ELECTRICAL / ELECTRONICS CONTROLS/ DRIVES

<table>
<thead>
<tr>
<th>AUTOMATION</th>
<th>PROCESS INSTRUMENTATION</th>
<th>ROBOTICS</th>
<th>CNC</th>
<th>MECHATRONICS</th>
<th>ELECTRICAL</th>
<th>PNEUMATICS &amp; HYDRAULICS</th>
<th>PUMPING, PIPING &amp; WELDING</th>
<th>ELECTRONICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC, Profibus, Profinet</td>
<td>Smart Instrumentation</td>
<td>Use &amp; Programming of Industrial Robots</td>
<td>840D sl</td>
<td>Mechatronics Concept Design</td>
<td>Induction Motors</td>
<td>Pneumatics</td>
<td>Pumping System</td>
<td>Radar Systems</td>
</tr>
<tr>
<td>HMI &amp; NETWORKING</td>
<td>PCS 7</td>
<td>Robotics Application</td>
<td>MILLING NC Programming</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SCADA</td>
<td></td>
<td></td>
<td>TURNING - NC Programming</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

---

# HARDWARE
- LMS SCADA
- 840D sl
- 808D MILLING/TURNING
- S7 1200 PLC
- S7 1500 PLC
- PCS 7
- KUKA ROBOT
- MECHATRONICS SYSTEM
- KEMPPi WELDING
- PROFIBUS/NET
- SINAMICS
- SIMOCODE
- SITRANS
- BARCO-3D
- OCULUS-RIFT
About Us

Centre of Excellence in Maritime & Shipbuilding is a dedicated centre for facilitating Professional skill development and enhancement in Maritime, Manufacturing automobile aerospace and heavy engineering sectors. Our mission is to promote advancement & implementation of maritime industrial skills in advanced digital smart manufacturing through Research and education partnership with the industry, and turn the vision of the next industrial 4.0 revolution into reality.

WORLD CLASS INFRASTRUCTURE
CUSTOMISED TRAINING
RESEARCH & DEVELOPMENT

The capacity of infrastructure can train 10,512 trainees in one year. This provides an immense potential for the country, the industry and the people in the industries to up-skill and re-skill themselves in relevant marketable technology.
FROM THE CEO’S DESK

Admiral Mital, our CEO & MD brings on board 38 Years of Operational Experience in Navy and industry. Prior to joining CEMS, he was Chairman & Managing Director of Goa Shipyard Ltd for about five years, where the yard witnessed a major turnaround from a loss-making entity to the ‘Best Performing & Fastest Growing’ Shipyard of the country. He has served in the Indian Navy for over 35 years and has held key prestigious appointments including Director Gen Naval Design (Submarines), where he has worked on high end CAD/CAM/CAE systems and have dealt with multiple mega contracts. He brings first hand understanding of industry Skill requirements and embodies professionalism, integrity & transparency which are key credos of CEMS.

RAdm Shekhar Mital
MD&CEO CEMS
(Ex-CMD Goa Shipyard Ltd.)

Centre of Excellence in Maritime & Shipbuilding is an inter-disciplinary, industry backed, Section 8, ‘Not for Profit’ Organization, with the vision to become an International Nodal Centre of Excellence in design and Engineering training. It has been set up with with support of Sagarmala/ Ministry of Shipping, Indian Register of Shipping and M/s Siemens.

At CEMS, we commit to create best infrastructure, training & R&D facilities to empower our industries with skilled manpower in raising the standard of Engineering design and manufacturing practices, leading to robust economy. Our Technology Partner M/s Siemens, harnesses its best-in-class global technology and manufacturing expertise, to nurture excellence in the field of technical practical education.

In order to remain competitive, and ahead of the curve, it is imperative for industry to adopt disruptive technologies, to transition to industry 4.0. This however, requires skilled digital man power, which is not available readily, affecting their competitiveness and productivity. CEMS aims to bridge this gap between industry requirements and technical education system, by training / skilling technical students on advance design and manufacturing world class software, so as to hasten up automation and make India a design and manufacturing hub and world leader in producing advance system locally. We provide excellent R & D opportunities to support industries and MSMEs for prototyping and testing of products and services, to foster significant innovation.

We seek to deliver a better tomorrow as a trusted single stop training partner, on future technologies embodying the values of entrepreneurial leadership, teamwork and integrity.

Regards
RAdm Shekhar Mital
MD&CEO

Email: shekhar.mital@cemsindia.org
Tel: 022 7119 9380 Mob:97 6403 0800
INDUSTRY TRAINING

The industrial sector’s contribution is crucial for country’s economy. Innovative, rapidly changing manufacturing practices, and emerging technology trends, need employees to be trained on new technologies in manufacturing facilities.

In order to efficiently lead your organization, you need specialized training partner who truly understands the manufacturing industry and its unique demands, a partner with leading edge of technology blended with customized training programs.

ACADEMIC TRAINING

Academic Skill Development program aims at linking education system to industry. The learning model connects the four spokes of individuals & institutions to industry and knowledge bodies. Our courses in wide ranging disciplines will help to address, short to long term skill development requirements ranging from Design to Manufacturing to Automation to Maintenance. The centre will also facilitate industry- Academia interface in conducting both basic and applied researches, the latter of greater interest to industry.
TRAINING TO TECHNICAL INSTITUTES

Academic Skill Development program aims at linking education system to industry. The learning model connects the four spokes of individuals & institutions to industry and knowledge bodies. Our courses in wide ranging disciplines will help to address, short to long term skill development requirements ranging from Design to Manufacturing to Automation to Maintenance. The centre will also facilitate industry-Academia interface in conducting both basic and applied researches, the latter of greater interest to industry.

HIGHLIGHTS

• WORLD CLASS INFRASTRUCTURE
• SUBSIDIZED FEES
• CERTIFICATE BY SIEMENS & IRCCLASS
• LATEST HARDWARE & SOFTWARE
• 18 STATE OF ART LABS
• INDUSTRY ORIENTED COURSES
• INDUSTRY 4.0 FOCUS
COURSES RELEVANT FOR FOLLOWING INDUSTRIES

MARITIME

DEFENCE

AUTOMOBILE

HEAVY ENGINEERING

AEROSPACE

OIL & GAS
1. Design & Digital Manufacturing
   - Product Design and Validation
   - Advanced Manufacturing
   - Test and Optimisation
   - Hull – Design Activity Improvement
   - Dimensional Accuracy

Digital Production Twins & Experience
   - Virtual Reality

2. Advance Manufacturing
   - Welding Technology
   - Robotics Lab
   - Automation Lab
   - Mechatronics
   - Electrical and energy saving
   - Process Instrumentation
   - Research Machine Shop

3. Operations and Management
   - Pneumatic & Hydraulic
   - Pumps Training Systems
   - Piping Training Systems
   - Radar Training
A. PRODUCT DESIGN & VALIDATION (13)

Location: Mumbai & Vizag

COURSES

1. Essentials for Designers
2. Sketching Fundamentals
3. Synchronous Modelling Fundamentals
4. NX Sheet Metal
5. Drafting Essentials
6. Intermediate Design & Assemblies
7. Advanced Assembly Design
8. Class A Free Form Modelling
9. NX Manufacturing Fundamentals
10. Turning Manufacturing Process
11. Engine Design
12. Advanced Simulation
13. Composite Structure & Assembly

Siemens NX-11
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Software/Hardware Type</th>
<th>Course Duration</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDV(B)01</td>
<td>Basic</td>
<td><strong>NX - 11 (Software)</strong>, Computer System (Hardware)</td>
<td>40HOURS</td>
<td><strong>After you complete this course, you should be able to</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Open and examine NX models.</td>
</tr>
<tr>
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<td></td>
<td>Create and edit parametric solid models.</td>
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<tr>
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<td></td>
<td></td>
<td>Create and modify basic assembly structures.</td>
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<td></td>
<td>Create and modify simple drawings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
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<th>Course Duration</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDV(I)01</td>
<td>Intermediate</td>
<td><strong>NX - 11 (Software)</strong>, Computer System (Hardware)</td>
<td>16HOURS</td>
<td><strong>After successfully completing this course, you will be able to</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Understand when and why to use sketches.</td>
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<td></td>
<td>Create sketches.</td>
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<tr>
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<td></td>
<td></td>
<td>Constrain sketches.</td>
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<tr>
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<td></td>
<td>Incorporate design intent in sketches.</td>
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<tr>
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<td></td>
<td>Utilize additional sketch techniques.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Software/Hardware Type</th>
<th>Course Duration</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDV(I)02</td>
<td>Intermediate</td>
<td><strong>NX - 11 (Software)</strong>, Computer System (Hardware)</td>
<td>8HOURS</td>
<td><strong>After you complete this course, you should be able to</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pull, move, and replace faces</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Resize and replace blends</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Resize and label chamfers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Delete faces</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Cut, copy, paste, and pattern faces</td>
</tr>
</tbody>
</table>
Create linear, angular, and radial dimensions
Shell faces
Edit a cross section

**4.NX Sheet Metal**

Course Code: PDV(I)03
Level: Intermediate
Software/Hardware Type: NX - 11 (Software) Computer System(Hardware)
Course Duration: 16HOURS

**Brief Description**

_Before successfully completing this course, you should be able to_

Use Design Intent to plan and create Sheet Metal parts.
Set up default standards and creation preferences.
Use Sheet Metal tools to create base features and add more advanced features to them.
Use the Sketch Task Environment to create and edit profiles for sheet metal parts.
Edit parametric features.

**5.Drafting Essentials**

Course Code: PDV(I)04
Level: Intermediate
Software/Hardware Type: NX - 11 (Software) Computer System(Hardware)
Course Duration: 24HOURS

**After successfully completing this course, you should be able to perform the following activities in NX**

Navigate through the drafting user interface.
Create and maintain drawing sheets and views.
Create and edit user-defined view boundaries.
Create and edit associative section views.
Create view dependent geometry.
Create and edit symbols, dimensions and text
Generate an assembly parts list.
## 6. Intermediate Design & Assemblies

**Course Code:** PDV(I)05  
**Level:** Intermediate  
**Software/Hardware Type:** NX - 11 (Software)Computer System(Hardware)  
**Course Duration:** 16HOURS

### After you successfully complete this course, you should be able to:
- Pattern sketch curves  
- Offset sketch curves  
- Create a basic free form shape  
- Create expressions with measurements  
- Copy/paste a feature o Create reference sets  
- Create draft  
- Use Synchronous Modelling  
- Create a variable blend  
- Create component arrays  
- Apply top down assembly Modelling  
- Design “in context”  
- Use the WAVE geometry linker  
- Create interpret references  
- Define remembered assembly constraints  
- Define a revision identifier  
- Understand component replacement methods  
- Manage assembly arrangements

## 7. Advanced Assembly Design

**Course Code:** PDV(A)01  
**Level:** Advanced  
**Software/Hardware Type:** NX - 11 (Software)Computer System(Hardware)  
**Course Duration:** 60HOURS

The Advanced Assemblies course is designed to help you build and maintain large assemblies. The course continues your education with more advanced practices within Assemblies and contains many different topics that can be utilized across many industry needs. Such topics include; Versioning, Cloning, Introduction to Skeleton Modelling, Interpart Expressions, Assembly Sequencing, Explosions and Component Fit and Weight.
8. Class A Free from Modelling

Course Code: PDV(A)02
Level: Advanced
Software/Hardware Type: NX - 11 (Software) Computer
Course Duration: 40HOURS

After successfully completing this course, you should be able to perform the following activities in NX:
- Create and edit splines and other curves.
- Create and edit primary and transition surfaces using freeform curves and faces.
- Through Curve surfaces, Through Curve Mesh surfaces.
- Swept surfaces and bodies, Section surfaces and bodies.
- Bridge surfaces, Face and Soft Blends.
- N-Sided surfaces analyze curves and faces.

9. NX Manufacturing Fundamentals

Course Code: PDV(B)02
Level: Basic
Software/Hardware Type: NX - 11 (Software) Computer
Course Duration: 24HOURS

After successfully completing this course, you should be able to perform the following activities:
- Create manufacturing assemblies.
- Understand the master model concept.
- Create parent group objects that supply information to operations.
- Utilize options and parameters that are common to various operation types.
- Create drilling, milling, and subsequent tool paths.
10. Turning Manufacturing Process

Course Code: PDV(I)06
Level: Intermediate
Software/Hardware Type: NX - 11 (Software) Computer System(Hardware)
Course Duration: 24HOURS

After successfully completing this course, you will be able to
Create cross-sectional curves for use in defining part and blank geometry.
Define part and blank geometry for Turning operations.
Create facing, centre line drilling, roughing, grooving, finishing, and threading operations.
Visually verify the program by displaying 2D and 3D dynamic material removal.
Define part geometry for parts mounted at each spindle of a multiple spindle machine.
Manage the in-process work piece as it is passed from one spindle to the next.
Create a program that contains milling and turning operations.

11. Engine Design

Course Code: PDV(A)03
Level: Advanced
Software/Hardware Type: NX - 11 (Software) Computer System(Hardware)
Course Duration: 35HOURS

After successfully completing this course, you should be able to
Understand the concept of controlling all the desired design criteria, geometrically and/or dimensionally at the assembly level.
Create a starter model that is driven overall by formerly created skeleton assembly, along with WAVE linked criteria data.
Showcase the adjustment of driving the criteria parameters to comply with packaging, functional, and with specific performance requirements.

Contd..
Develop a complete piston, connecting rod and crankshaft by examining their typical features and characteristics.

12. Advanced Simulation

Course Code: PDV(I)07
Level: Intermediate
Software/Hardware Type: NX - 11 (Software) Computer System (Hardware)
Course Duration: 60 HOURS
Brief Description:
- Understanding CAE, Engineering problems.
- Methods to solve Engineering problems.
- Check the quality of the mesh before solving.
- Working with simulation project.

13. Composite Structure & Assembly

Course Code: PDV(I)08
Level: Intermediate
Software/Hardware Type: NX - 11 (Software) Computer System (Hardware)
Course Duration: 40 HOURS
Brief Description:
This course is designed to cover the theory of composites materials, Processing method of composite structure and how to model the laminate structure using NX and analysis of composite structure & assembly using NX
B. ADVANCED MANUFACTURING (7)

Location: Mumbai & Vizag

COURSES

14. TCUA - Using TC
15. TCUA - Installation
16. TCUA - Integration for NX users
17. TCUA - Application & Data Model Administration
18. Tecnomatix – Process
19. Tecnomatix – RobCAD
20. Tecnomatix – Flow

SIEMENS TEAMCENTER 11, TECNOMATIX 14.0.2, ROBCAD 11
### 14. TCUA Using TC

**Course Code:** AM(B)01  
**Level:** Basic  
**Software/Hardware Type:** Team Centre 11 (Software)  
**Computer System/Hotware**  
**Course Duration:** 32HOURS  
**Brief Description:**

After successfully completing this course, you should be able to:

- To learn the basic concepts of product lifecycle management.
- To use Team center to perform basic user tasks.
- To create and work with Team center items and item revisions.
- To organize, manage, and secure product data.
- To use various navigation methods to locate, view, and report on product data.
- To use the Structure Manager application to view, build, and edit product structure.
- To navigate the classification hierarchy and use standard product data in product structures.
- To use the embedded viewer to locate and view visualization data.
- To use Workflow Viewer to assign tasks, perform tasks, and track the completion of tasks in a workflow process.
- To use Change Manager to create change objects and track a change object through the change process to completion.
- To use the thin client to manage and navigate to various Teamcenter objects and functions.

### 15. TCUA - Installation

**Course Code:** AM(B)02  
**Level:** Basic  
**Software/Hardware Type:** Team Centre 11 (Software)  
**Computer System/Hotware**  
**Course Duration:** 40HOURS  
**Brief Description:**

After successfully completing this course, you should be able to:

- To define the Team center two-tier architecture, the four-tier architecture, and File Management System
- To define relational database management system concepts and installation processes
- To install the corporate server

Contd..
16.TCUA - Integration for NX Users

Course Code: AM(I)01
Level: Intermediate
Software/Hardware Type: Team Centre 11 (Software)
Computer System(Hardware)
Course Duration: 8HOURS

Brief Description

After successfully completing this course, you should be able to

- To start Teamcenter Integration for NX and access the Online Help system.
- To learn how NX data is created, stored, accessed, edited, and shared using Teamcenter Integration for NX.
- To become familiar with the Teamcenter Navigator user interface.
- To understand the structure of NX data managed by Teamcenter Integration for NX.
- To understand the steps required for successfully sharing data and working in a shared assignment.
- To learn how to import and export assemblies in and out of the Teamcenter database.
- To learn how to create part families.
- To learn how to work with large assemblies.
- To learn about Multi-CAD in NX.
- To learn how datasets relate to each other.
- To learn how to create assembly arrangements in NX and view them in Teamcenter.
### 17. TCUA - Application & Administration

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>AM(A)01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
<td>Advanced</td>
</tr>
<tr>
<td>Software/Hardware Type:</td>
<td>Team Centre 11 (Software)</td>
</tr>
<tr>
<td>Computer System(Hardware)</td>
<td></td>
</tr>
<tr>
<td>Course Duration:</td>
<td>40HOURS</td>
</tr>
</tbody>
</table>
| Brief Description | **After successfully completing this course, you should be able to**

Data Model administration
- To work with data model files and template projects.
- To perform data model changes with live data model updates.
- To configure the Business Modeller IDE and to execute the basic Business Modeller IDE process.
- To create and work with business objects and classes.
- To modify properties and attributes.
- To create and attach a list of values (LOV) to a property.
- To create and configure options.
- To create rules for business objects.

Application administration
- To create an organization.
- To configure access permissions and projects to control access.
- To configure the working environment and manage preferences.
- To create saved queries and report definitions.
- To create and manage workflow process templates.
- To create and work with PLM XML import and export. |

### 18. Tecnomatix – Process

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>AM(I)02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware Type:</td>
<td>Tecnomatix 14.0.2 (Software)</td>
</tr>
<tr>
<td>Computer System(Hardware)</td>
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<tr>
<td>Course Duration:</td>
<td>40HOURS</td>
</tr>
<tr>
<td>Brief Description</td>
<td>The course covers Tecnomatix Process Designer, General Assembly, Data Management, Variants etc</td>
</tr>
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</table>
### 19. Tecnomatix – RobCAD

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>AM(I)03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware Type:</td>
<td>RobCAD 11 (Software)</td>
</tr>
<tr>
<td>Course Duration:</td>
<td>150 HOURS</td>
</tr>
<tr>
<td>Brief Description</td>
<td>After successfully completing this course, you should be able to: ● Introduction to Robcad environment. ● Workcell Layout. ● Modelling &amp; Kinematics. ● Process Design &amp; Simulation.</td>
</tr>
</tbody>
</table>

### 20. Tecnomatix – Flow

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>AM(I)04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware Type:</td>
<td>AutoCAD</td>
</tr>
<tr>
<td>Course Duration:</td>
<td>50 HOURS</td>
</tr>
<tr>
<td>Brief Description</td>
<td>By the end of this course, you will learn ● How to optimize a factory layout based on material flow distances, frequency and cost ● How to evaluate and analyse things such as • Part routing information • Material storage needs • Material handling equipment specification • Part packaging information against factory layout</td>
</tr>
</tbody>
</table>


C.TEST & OPTIMIZATION (6)

Location: Mumbai & Vizag

COURSES

21. Vibration Measurements and Analysis
22. Modal Testing and Analysis
23. Acoustics Measurements and Analysis
24. Acoustics NVH Simulation
25. Multi Body Dynamics
26. Advanced Finite Element Analysis (FEA)

SIEMENS LMS, SCADA, NX-11
# 21. Vibration Measurements and Analysis

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>TO(I)01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware type:</td>
<td>LMS Test Lab (Software)</td>
</tr>
<tr>
<td></td>
<td>LMS SCADAS Mobile 1-slot mainframe (Hardware)</td>
</tr>
<tr>
<td></td>
<td>LMS SCADAS Mobile 8-channel input module (Hardware)</td>
</tr>
<tr>
<td>Computer System (Hardware)</td>
<td></td>
</tr>
<tr>
<td>Course Duration</td>
<td>20HOURS</td>
</tr>
<tr>
<td>Brief Description</td>
<td>This course contents basics of Vibrations, Terminology, Techniques and Methods of Vibration Measurements Analysis</td>
</tr>
</tbody>
</table>

# 22. Modal Testing and Analysis

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>TO(I)02</th>
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</thead>
<tbody>
<tr>
<td>Level</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware type:</td>
<td>LMS Test Lab (Software)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>LMS SCADAS Mobile 8-channel input module (Hardware)</td>
</tr>
<tr>
<td>Computer System (Hardware)</td>
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</tr>
<tr>
<td>Course Duration</td>
<td>30HOURS</td>
</tr>
<tr>
<td>Brief Description</td>
<td>After successfully completing this course, you should be able to</td>
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<tr>
<td></td>
<td>● Understand the basics of modal analysis and GVT testing</td>
</tr>
<tr>
<td></td>
<td>● Define the SDOF and MDOF systems and their formulas</td>
</tr>
<tr>
<td></td>
<td>● Understand modal testing and frequency response functions, boundary conditions, impact and shaker testing</td>
</tr>
<tr>
<td></td>
<td>● Illustrate the test setup and processing.</td>
</tr>
</tbody>
</table>
# 23. Acoustics Measurements & Analysis

**Course Code:** TO(I)03  
**Level:** Intermediate  
**Software/Hardware type:**  
- LMS Test Lab (Software)  
- LMS SCADAS Mobile 1-slot mainframe (Hardware)  
- LMS SCADAS Mobile 8-channel input module (Hardware)  
- Computer System (Hardware)

**Course Duration:** 30HOURS  
**Brief Description:**  
After successfully completing this course, you should be able to  
- Understand the concepts of acoustics and its importance in engineering  
- Know the concepts of sound fields, sound quality and its analysis and diagnosis and the importance of sound quality in manufacturing  
- Learn the concept of sound absorption and transmission testing.body

# 24. Acoustics NVH Simulation

**Course Code:** TO(I)04  
**Level:** Intermediate  
**Software/Hardware type:**  
- LMS Test Lab (Software)  
- LMS SCADAS Mobile 1-slot mainframe (Hardware)  
- LMS SCADAS Mobile 8-channel input module (Hardware)  
- Computer System (Hardware)

**Course Duration:** 20HOURS  
**Brief Description:**  
After successfully completing this course, you should be able to  
- Learn about the interface and infrastructure of acoustics.  
- Create finite, boundary, multipole and time domain boundary element method.  
- Develop the load and force identification and FRF based response along with a knowledge to work on FBS and noise vibration analysis.
### 25. Multi Body Dynamics

**Course Code:** TO(A)01  
**Level:** Advanced  
**Software/Hardware type:**  
- LMS Test Lab (Software)  
- LMS SCADAS Mobile 1-slot mainframe (Hardware)  
- LMS SCADAS Mobile 8-channel input module (Hardware)  
- Computer System (Hardware)  
**Course Duration:** 30HOURS  
**Brief Description:** This Lab offers a unique combination of simulation software, mobile and lab-testing systems to address functional performance engineering challenges of shipbuilders and their suppliers.

### 26. Advanced Finite Element Analysis

**Course Code:** TO(A)02  
**Level:** Advanced  
**Software/Hardware type:**  
- NX-11 (Software)  
- Computer System (Hardware)  
**Course Duration:** 90HOURS  
**Brief Description:** This course designed to provide technical knowledge for students new to the industry who wish to become professionals in the CAE Analyst. This course examines Essential for NX designer, Advance simulation processes and solutions through Analytical method. This training will focus on in-depth explanations and hands-on demonstrations of industrial components.
D.RESEARCH MACHINE SHOP(3)

Location: Vizag

COURSES

27. TURNING-Numerical Control Programming
28. MILLING-Numerical Control Programming
29. 840Dsl

SINUTRAIN, SINUMERIK 840D sl
### 27. TURNING - Numerical Control Programming

**Course Code:** RMS(I)01  
**Level:** Intermediate  
**Software/Hardware type:** Sinutrain (Software)  
**Computer System (Hardware)**  
**Course Duration:** 32HOURS  
**Brief Description:** After successfully completing this course, you should be able to perform the following activities on CNC Turning Machine:  
- Introduction to Manufacturing, History & Processes  
- Introduction to Conventional Lathe  
- Introduction to MCMT/CNC  
- Mechanical Elements of CNC machine  
- Introduction to CNC Programming  
- Introduction to SIEMENS 808D controller  
- Geometric Dimensioning & Tolerancing  
- Cutting Tools and Parameter Selection Turning  
- Programming using Siemens standard cycles for Turning  
- Hands on practical – All standard Cycles of 808D Turning

### 28. MILLING - Numerical Control Programming

**Course Code:** RMS(I)02  
**Level:** Intermediate  
**Software/Hardware type:** Sinutrain (Software)  
**Computer System (Hardware)**  
**Course Duration:** 32HOURS  
**Brief Description:** After successfully completing this course, you should be able to perform the following activities:  
- Elements of CNC machine  
- Introduction To CNC Programming  
- Introduction to SIEMENS 808D controller.  
- Cutting Tools and Parameter selection Milling  
- Milling Work holding & Tool Holding Devices  
- Basics Milling Programming  
- Programming using Siemens standard cycles for Milling  
- Hands on practical – All standard Cycles of 808D Milling
<table>
<thead>
<tr>
<th>Course Code:</th>
<th>29.840Dsl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Advanced</td>
</tr>
<tr>
<td>Software/Hardware type:</td>
<td>840D sl training rack</td>
</tr>
<tr>
<td>Course Duration</td>
<td>Computer System (Hardware)</td>
</tr>
<tr>
<td>Brief Description</td>
<td>120HOURS</td>
</tr>
<tr>
<td></td>
<td>• Sinumerik 840D sl controller</td>
</tr>
<tr>
<td></td>
<td>• Creating G code program</td>
</tr>
<tr>
<td></td>
<td>• Creating a ShopTurn program</td>
</tr>
<tr>
<td></td>
<td>• Creating a ShopMill program</td>
</tr>
<tr>
<td></td>
<td>• Drilling cycles</td>
</tr>
<tr>
<td></td>
<td>• Milling cycles</td>
</tr>
<tr>
<td></td>
<td>• Turning cycles</td>
</tr>
</tbody>
</table>
E.AUTOMATION(3)

Location: Vizag

COURSES

30. BASICS OF PLC
31. BASICS OF HMI & NETWORKING
32. BASICS OF SCADA

S7 1200 S7 1500 PLC TIA PORTAL
### 30. Basics of PLC

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>AN(B)01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Basic</td>
</tr>
<tr>
<td>Software/Hardware type:</td>
<td>S7 1200 PLC with HMI (Hardware) S7 1500 PLC with HMI (Hardware) TIA Portal (Software) WinCC (Software)</td>
</tr>
<tr>
<td>Course Duration</td>
<td>40HOURS</td>
</tr>
</tbody>
</table>
| Brief Description | **On completion of this course the participant will be able to:**   
  - Identify the components and performance characteristics of the SIMATIC S7-1200 PLC
  - Install a PLC system, including the HMI and communication cabling.
  - Understand Industrial communication protocols – Profibus, Profinet.
  - Uploading and downloading program in plc
  - Use the various address types to edit, reload, structure and run a program
  - Document, test, and basically troubleshoot the control system and its program
  - Understand and create binary operations, timers, counters, scaling blocks etc. |

### 31. Basics of HMI & Networking

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>AN(I)01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware type:</td>
<td>S7 1200 PLC with HMI (Hardware) S7 1500 PLC with HMI (Hardware) TIA Portal (Software) WinCC (Software)</td>
</tr>
<tr>
<td>Course Duration</td>
<td>40HOURS</td>
</tr>
</tbody>
</table>
| Brief Description | **On completion of this course the participant will be able to:**   
  - Communicate between HMI and PLC
  - Communicate between PLC to PLC
  - Configure HMI
  - Understand various SIEMENS communication protocols. |
32. Basics of SCADA

Course Code: AN(B)02
Level: Basic
Software/Hardware type:
- S7 1200 PLC with HMI (Hardware)
- S7 1500 PLC with HMI (Hardware)
- TIA Portal (Software)
- WinCC (Software)

50 HOURS

On completion of this course the participant will be able to:
- The software structure of the system
- The interaction with the PLC
- The hardware specifications of the system
- The engineering phases of WinCC
- The possibilities for presentation, archiving and operating, process information alarms, measured values, and reports
- Making and testing the process pictures
- Configure the archiving and presentation of alarms, measured value & trends.
33. BASICS OF MECHATRONICS

Course Code: MT(I)01
Level: Intermediate
Software/Hardware type: Modular Mechatronics System
Course Duration: 50HOURS

On completion of this course the participant will be able to:

- Differentiate Mechatronics Systems
- Design, develop, maintain and manage high technology engineering systems for the automation of industrial tasks
- Trouble Shooting

Modular Mechatronics System
G. WELDING (1)

Location: Vizag

COURSES

34. WELDING

34. WELDING
Course Code: WT(I)01
Level: Intermediate
Software/Hardware type: Welding Machines
Course Duration: 60 HOURS

Brief Description
After successfully completing this course, you should be able to
● Understanding the different types of welding processes
● Selection of welding processes
● Quality techniques
● Safety Measures

KEMPPI WELDING
H.ROBOTICS(2)

Location: Vizag

COURSES

35. USE & PROGRAMMING OF INDUSTRIAL ROBOTS
36. ROBOTICS APPLICATION

KUKA ROBOTIC UNITS
<table>
<thead>
<tr>
<th>Course Code:</th>
<th>RB(A)01</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software/Hardware type:</td>
<td>KUKA Robotics Units</td>
<td></td>
</tr>
<tr>
<td>Course Duration</td>
<td>120HOURS</td>
<td></td>
</tr>
<tr>
<td>Brief Description</td>
<td>After successfully completing this course, you should be able to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Understanding the uses of robot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Offline programming</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Learn robotics hazard, safety</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>RB(A)02</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software/Hardware type:</td>
<td>KUKA Robotics Units</td>
<td></td>
</tr>
<tr>
<td>Course Duration</td>
<td>120HOURS</td>
<td></td>
</tr>
<tr>
<td>Brief Description</td>
<td>After successfully completing this course, you should be able to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Industrial robots</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Arc Welding, Spot welding, Material handling robots</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Creating robotic work cells for different applications.</td>
<td></td>
</tr>
</tbody>
</table>
I. PROCESS INSTRUMENTATION (2)

Location: Vizag

COURSES

37. BASICS OF PROCESS INSTRUMENTATION` 
38. BASICS OF PCS7

PCS 7
37. Basics of Process Instrumentation

Course Code: PI(I)01
Level: Intermediate
Software/Hardware type: PCS7 Hardware
Course Duration: 40HOURS
Brief Description: On completion of this course the participant will be able to
- Learn the principles of flow, Level, Pressure, Temperature measurement
- Identify the components and performance characteristics of Different Process Instruments
- Obtain and understand the principle of operation, selection and sizing of various Process Instruments
- Learn specifications, range, hardware / constructional details and features of the product
- Parameterize different Process Instruments for different configurations.

38. Basics of PCS7

Course Code: PI(I)02
Level: Intermediate
Software/Hardware type: PCS7 Hardware
Course Duration: 50HOURS
Brief Description: On completion of this course the participant will be able to
- Understand PCS7 hardware & software • Configure a typical project
- Program using STEP7 editors like CFC charts
- Understand and use of SFC.
- Operator control and monitoring using WinCC
- Configure Multi Project
- Communications between the S7 and WINCC
- PCS7 tag database. • Building WinCC screens
J. ELECTRICAL LAB(3)

Location: Vizag

COURSES

39. BASICS OF AC/DC DRIVES
40. BASICS OF LOW VOLTAGE SWITCH GEAR-1
41. BASICS OF LOW VOLTAGE SWITCH GEAR-2

SIMOCODE
39. Basics of AC/DC Drives

Course Code: EL(B)01
Level: Basic
Software/Hardware type:

- 6RA80 DC Drive with DC Motors (Hardware)
- G120 AC Drive with AC Motors (Hardware)
- SIMOCODE (Hardware + Software)

Course Duration: 40HOURS
Brief Description:
On completion of this course the participant will be able to
- Basic or fundamental knowledge of various DC/AC Variable speed drives
- The product specifications, range, hardware/constructional details and features of the product
- Perform drive start-up and parameterize drive for different configurations
Including use of programmable digital and analog inputs and outputs.

40. Basics of Low Voltage Switch Gear-1

Course Code: EL(I)01
Level: Intermediate
Software/Hardware type:

- LV-Switchgear (Hardware)
- MCCB Kit (3VA & 3VT) (Hardware)
- Star Delta Kit (Hardware)
- 3Ph AC Induction Motor (Hardware)
- PAC Meters (Energy Meters) (Hardware)

Course Duration: 40HOURS
Brief Description:
On completion of this course the participant will be able to
- Identify switchgear and its ratings
- Interpret Siemens schematics and wiring diagrams.
- Configure Soft starter.
- Start the Induction motor with different starting methods.
- Understand the Construction, Characteristics and operation of various Low Voltage Switch Gear.
### Course Code: EL(I)02

**Level:** Intermediate

**Software/Hardware type:**
- LV-Switchgear (Hardware)
- MCCB Kit (3VA & 3VT) (Hardware)
- Star Delta Kit (Hardware)
- 3Ph AC Induction Motor (Hardware)
- PAC Meters (Energy Meters) (Hardware)

**Course Duration:** 40HOURS

**Brief Description:**

On completion of this course the participant will be able to:

- Get Brief Idea on Power Generation, Transmission and Distribution
- Understanding of Different types of Earthing Systems and Cable dimensioning
- Understand Type of Faults and protection
- Configure PAC meter
- Rack breakers into or out of connected position safely
- Locate close and trip coils and motors of ACB
- Communicate with PAC4200 and 3WL-ACB using “Power Config” Software
K. PNEUMATICS & HYDRAULICS (2)

Location: Vizag

COURSES

42. PNEUMATICS
43. HYDRAULICS

PNEUMATICS & HYDRAULICS
42. Pneumatics
Course Code: P&H(I)01
Level: Intermediate
Software/Hardware type: Pneumatics Training Kits
Course Duration: 50HOURS
Brief Description: After successfully completing this course, you should be able to
- Understand the function of pneumatic system and its different applications
- Understand the function of signal processing structure, its different function blocks and types of signal of processing structure of pneumatic system.
- Understand the role of function diagram and pneumatic circuit diagram in pneumatic system
- Understand the function of actuation of pneumatic circuits of single and double acting cylinders
- Understand the function of different pneumatic components used in pneumatic system.

43. Hydraulics
Course Code: P&H(I)02
Level: Intermediate
Software/Hardware type: Hydraulics Training Kits
Course Duration: 50HOURS
Brief Description: After successfully completing this course, participants should be able to
- Understand the function of Hydraulics system and its different applications
- Understand the function of signal processing structure, its different function blocks and types of signal of processing structure of Hydraulics system
- Understand the role of function diagram and Hydraulics circuit diagram in Hydraulics system
- Understand the function of actuation of Hydraulics circuits of single and double acting cylinder
- Understand the function of different Hydraulics components used in Hydraulics system.
## L. VIRTUAL REALITY (1)

Location: Vizag

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### COURSES

<table>
<thead>
<tr>
<th>44. VIRTUAL REALITY</th>
<th>INTERMEDIATE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>VR(I)01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Software/Hardware type:</td>
<td>Multi-format Transmitter &amp; receiver</td>
</tr>
<tr>
<td></td>
<td>High Resolution WUXGA</td>
</tr>
<tr>
<td></td>
<td>3D Active Stereo Glasses</td>
</tr>
<tr>
<td></td>
<td>Head Mounted Device(HMD)</td>
</tr>
<tr>
<td>Course Duration</td>
<td>50HOURS</td>
</tr>
<tr>
<td>Brief Description</td>
<td>After completing this course, you will be able to</td>
</tr>
<tr>
<td></td>
<td>● Understand what is virtual reality</td>
</tr>
<tr>
<td></td>
<td>● Understand about various types of virtual reality</td>
</tr>
<tr>
<td></td>
<td>● Understand how to use virtual reality in industries</td>
</tr>
<tr>
<td></td>
<td>● Understand about advantages and disadvantages of virtual reality</td>
</tr>
<tr>
<td></td>
<td>● Understand the future impact of virtual reality</td>
</tr>
</tbody>
</table>

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**OCULUS-RIFT**  **BARCO-3D**
M.PUMPS TRAINING LAB(1)

Location: Vizag

45. PUMPING SYSTEM

Course Code: PUTS(B)01
Level: Basic
Software/Hardware type: Pump Training Kit
Course Duration: 50HOURS

After completing this course, you will be able to
- Pump installation
- Performance Testing, Commissioning and Acceptance
- Operator Training
- Pump Maintenance and Reliability
- Condition Monitoring and Predictive Maintenance
- Precision Maintenance
- Importance of proper selection of pumping system for the given application
- Principles of efficient operation of pumping equipment
- Steps in optimization of pumping system for the given operation
- Explanation of the root causes of problems in pumping systems
- Condition monitoring procedures
- Methods of maintenance, repair and troubleshooting of the pumping system"
N.PIPING TRAINING LAB(1)

Location: Vizag

COURSES

46.PIPING SYSTEM
Course Code: PITS(B)01
Level: Basic
Software/Hardware type: Piping Training Kit
Course Duration: 60HOURS
Brief Description:
In this course, you will learn the Piping System and Piping Layout, Pipe joining methods, piping stress analysis.
- International codes & Standards using for piping system & its components
- Plant layouts and workflow procedures
- Terminology and symbols used in plant layout
- Plot plans, Equipment Layouts, elevations and 3-D models
- Process flow diagrams (PFDs)
- Equipment used in process plants
- Instrument symbols and abbreviations
- Piping and instrumentation diagrams (P&IDs)
- Piping design and engineering principles
- Terminology, symbols and abbreviations used in piping design
- Piping materials
- Piping specifications and piping codes
- Components of piping systems – fittings, flanges and valves
- Piping isometrics
- Bill of materials
O.RADAR LAB(1)

Location: Vizag

COURSES

46.RADAR SYSTEM
**46. Radar System**

**Course Code:**
RS(A)01

**Level:**
Advanced

**Software/Hardware type:**
Basic Radar Training System

**Course Duration:**
60HOURS

Radar Systems Training covers the basics of Radar systems including basic design of a radar system, functionality, architecture and critical components, transmitter/receiver, and antenna. Learn the basic operating principle of a primary radar set and development, testing, and support of radar.

- Principles and concepts related to the radar system and operation
- Describe theory of operation of a simple Radar including radar range equation
- Explain how Radar works and compare different type of Radar system functionality
- Discuss principles, procedures, techniques and evolution of radar technology
- Examine Radar Concept of Operation (ConOps), functional architecture, system requirement, system design, architecture
- Operation and maintenance, and troubleshooting
- Sketch a high-level architecture of a simple Radar system
- Covering components and subsystems including transmitters, receivers, antennas, clutter and noise, detection, signal processing modules
- Determine basic acceptable Radar system performance based on radar environment
- Provide detection, identification, and classification of objects/targets using different radar systems
- Discuss applications and technologies behind microwave and millimeter-wave Radar systems
- Discuss the evolution of Radar technologies.
**Location:** Vizag

### COURSES

<table>
<thead>
<tr>
<th>Course Code:</th>
<th>DACS(I)01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level</strong></td>
<td>Intermediate</td>
</tr>
<tr>
<td><strong>Software/Hardware type:</strong></td>
<td>Ship-building Block Measurement Software</td>
</tr>
<tr>
<td></td>
<td>Ship-building Block Dimensional Error Analysis</td>
</tr>
<tr>
<td></td>
<td>Ship-building Block Erection Forecasting Analysis</td>
</tr>
<tr>
<td><strong>Course Duration</strong></td>
<td>120HOURS</td>
</tr>
<tr>
<td><strong>Brief Description</strong></td>
<td>This course introduces dimensional metrology, improves measurement behaviours and supports good measurement practice. In addition, it explores the relevance of Dimensional Measurement Accuracy control techniques to all stages of the engineering process.</td>
</tr>
</tbody>
</table>

**SAMIN**
# Q. HULL DESIGN

**Location: Mumbai & Vizag**

## COURSES

### 49. HULL DESIGN

<table>
<thead>
<tr>
<th>49.Hull Design</th>
<th>ADVANCED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Code:</strong></td>
<td>HD(A)01</td>
</tr>
<tr>
<td><strong>Level:</strong></td>
<td>Advanced</td>
</tr>
<tr>
<td><strong>Software/Hardware type:</strong></td>
<td>Paramarine</td>
</tr>
<tr>
<td><strong>ShipWeigh</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ShipWeight</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Course Duration</strong></td>
<td>120HOURS</td>
</tr>
<tr>
<td><strong>Brief Description</strong></td>
<td>Making Curved Shell, Deck plating, Bulkheads and other structural members. Adding Stiffners, Brackets, Cutouts and other detailed features. Making of Structural Hull Drawings</td>
</tr>
<tr>
<td></td>
<td>This course enables designers to understand Hull design concepts, use of NX CAD tool for Hull Modelling, Drafting, etc</td>
</tr>
</tbody>
</table>

**SIEMENS NX-11  PARAMARINE**
R.NESTING PRODUCTIVITY IMPROVEMENT (1)

Location: Mumbai & Vizag

COURSES

50. NESTING PRODUCTIVITY IMPROVEMENT

CADWIN
50. Nesting Productivity Improvement

Course Code: NP(I)01
Level: Intermediate
Software/Hardware type: CADWIN- Plate, Flatbar, Profile
Course Duration: 120HOURS

Brief Description:
This Lab offers a unique combination of simulation software, mobile and lab-testing systems to address functional performance engineering challenges of shipbuilders and their suppliers.

- Automatic part arrangement for nesting, and support for manual part arrangement.
- Automatic or manual cutting path definition
- Automatic beveling/bridging / common cutting / multi-touching
- Marking and punching at curve surfaces
- Direct N/C code generation (EIA/ESSI)
- Import from 2D drawings and export of drawing files into CADWIN base and automatic generation of production drawing on the steel plate.
- Generation of production information including data for cutting length, centre of gravity, weight, painting area, welding length, bevel, etc.
- Verifying and simulation of N/C code data for plate cutting
- Support of process for procurement of steels
- Pre-nesting for procurement and ordering of steel plate
- Detail quantifying of number of quantity of steel for procurement
- Control and management of amount of scrap rate
- Common database interface by ODBC
- Support for customization for additional functions if required. (e.g., TRIBON interface.)
- Simultaneously manipulate multi-sheet cutting plan
- Easy setting for N/C machine
- Interactive execution mode for all operations
- Easy and fast ways to correct production data against design changes
- Automatic cutting sequence assignment
- Automatic Torch Spacing Control
<table>
<thead>
<tr>
<th>Sl No</th>
<th>Course Title</th>
<th>Course Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diploma in CAD</td>
<td>200 hrs</td>
</tr>
<tr>
<td>2</td>
<td>Diploma in CAE (Prerequisite Diploma in CAD)</td>
<td>150 hrs</td>
</tr>
<tr>
<td>3</td>
<td>Diploma in Digital Manufacturing</td>
<td>200 hrs</td>
</tr>
<tr>
<td>4</td>
<td>Diploma in PLM (Product Life Cycle Management)</td>
<td>200 hrs</td>
</tr>
<tr>
<td>5</td>
<td>Diploma in Robotics</td>
<td>250 hrs</td>
</tr>
<tr>
<td>6</td>
<td>Diploma Course in NVH (Noise, Vibration, Harness)</td>
<td>150 hrs</td>
</tr>
<tr>
<td>7</td>
<td>Diploma course in Automation &amp; Mechatronics</td>
<td>200 hrs</td>
</tr>
<tr>
<td>8</td>
<td>Diploma course in Pneumatics &amp; Hydraulics</td>
<td>200 hrs</td>
</tr>
</tbody>
</table>
### 1. Diploma in CAD

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Essentials for Designers</td>
<td>a) Understand fundamentals of CAD</td>
<td>Product Design and Validation</td>
</tr>
<tr>
<td>2 Sketcher Fundamentals</td>
<td>b) Create Sketched and Solid &amp; Surface Models</td>
<td></td>
</tr>
<tr>
<td>3 Synchronous Modelling Fundamentals</td>
<td>c) Build Assemblies</td>
<td></td>
</tr>
<tr>
<td>4 Sheet Metal</td>
<td>d) Prepare Manufacturing Drawing</td>
<td></td>
</tr>
<tr>
<td>5 Drafting Essentials</td>
<td>e) Use of Synchronous Modelling</td>
<td></td>
</tr>
<tr>
<td>6 Intermediate Design &amp; Assemblies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Advanced Assembly Design</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Duration:** 200 hrs

### 2. Diploma in CAE (Prerequisite Diploma in CAD)

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Finite Element Analysis</td>
<td>a) Understand fundamentals of Finite Element Analysis</td>
<td>Product Design and Validation</td>
</tr>
<tr>
<td>2 Advanced Simulation</td>
<td>b) Comprehend the user interface of Simulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Build CAE model including</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Meshing and quality checks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Boundary Conditions and Loading</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) Solution</td>
<td></td>
</tr>
<tr>
<td></td>
<td>g) Reporting</td>
<td></td>
</tr>
</tbody>
</table>

**Duration:** 150 hrs

### 3. Diploma in Digital Manufacturing

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NX Manufacturing Fundamentals</td>
<td>a) Understand fundamentals Digital Manufacturing</td>
<td>Product Design and Validation</td>
</tr>
<tr>
<td>2 Turning Manufacturing Process</td>
<td>b) Create Program for Milling &amp; Turning Operations</td>
<td>Research Machine Shop</td>
</tr>
<tr>
<td>3 TURNING-Numerical Control Programming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 MILLING-Numerical Control Programming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 840Dsl</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Duration:** 200 hrs

### 4. Diploma in PLM (Product Life Cycle Management)

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Essentials for Designers</td>
<td>a) Understand fundamentals CAD &amp; PLM</td>
<td>Product Design and Validation</td>
</tr>
<tr>
<td>2 Teamcenter Installation</td>
<td>b) Create sketches, part models, basic assemblies, drawings</td>
<td></td>
</tr>
<tr>
<td>3 TCUA - Using TC</td>
<td>c) Installation of Teamcenter</td>
<td>Advanced Manufacturing</td>
</tr>
<tr>
<td>4 TCUA - Integration for NX users</td>
<td>d) Understand &amp; Use of Teamcenter Functionalities</td>
<td></td>
</tr>
<tr>
<td>5 Teamcenter Application and Data Model Administration</td>
<td>e) Use of TC NX integration link</td>
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</tr>
<tr>
<td></td>
<td>f) Understand Data Model Administration activities</td>
<td></td>
</tr>
</tbody>
</table>

**Duration:** 200 hrs
### 5. Diploma in Robotics

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
</table>
| 1 Tecnomatix – RobCAD                       | a) Understanding work cell layout, Modelling, Kinematics, Robot Programming and Calibration  
| 2 Use and Programming of Industrial Robots   | b) Offline Programming                                                     | Advanced Manufacturing            |
| 3 Robotics Applications                     | c) Learn Industrial Robots                                                 | Robotics                           |
|                                              | d) Arc Welding                                                              |                                   |
|                                              | e) Spot Welding                                                             |                                   |
|                                              | f) Material Handling                                                       |                                   |
|                                              | g) Create Robotic workcell for different applications                      |                                   |

### 6. Diploma Course in NVH (Noise, Vibration, Harness)

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Advanced Finite Element Analysis</td>
<td>a) Understand fundamentals Vibrations, Noise</td>
<td>Test &amp; Optimization</td>
</tr>
<tr>
<td>2 Vibration Measurements and Analysis</td>
<td>b) Get familiar with Vibration, Acoustics measurements and processing</td>
<td></td>
</tr>
<tr>
<td>3 Modal Testing and Analysis</td>
<td>c) Understand dynamic behavior of structures</td>
<td></td>
</tr>
<tr>
<td>4 Acoustics Measurements and Analysis</td>
<td>d) Comprehend Acoustics NVH Simulation</td>
<td></td>
</tr>
<tr>
<td>5 Acoustics NVH Simulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Multi Body Dynamics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 7. Diploma course in Automation & Mechatronics

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Basics of PLC</td>
<td>a) Install a PLC system, including the HMI and communication cabling</td>
<td>Automation</td>
</tr>
<tr>
<td>2 Basics of HMI &amp; Networking</td>
<td>b) Understand Industrial communication protocols – Profibus, Profinet</td>
<td></td>
</tr>
<tr>
<td>3 Basics of SCADA</td>
<td>c) Communicate between HMI &amp; PLC including HMI configuration</td>
<td></td>
</tr>
<tr>
<td>4 Basics of Mechatronics</td>
<td>d) Understand and hands on with SCADA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Design, Develop, Maintain and Manage Mechatronics System</td>
<td></td>
</tr>
</tbody>
</table>

### 8. Diploma course in Pneumatics & Hydraulics

<table>
<thead>
<tr>
<th>Modules</th>
<th>Objectives</th>
<th>LAB</th>
</tr>
</thead>
</table>
| 1 Basics of Pneumatics                       | a) Understand the function of pneumatic, hydraulic systems and it different applications  
| 2 Basics of Hydraulics                       | b) Learn different Pneumatic & Hydraulic circuits                            | Pneumatics & Hydraulics            |
| 3 Pumping System                             | c) Understand Pump Operations, Installations, Maintenance, Condition Monitoring | Pumps Training System             |
| 4 Piping System                              |                                                                            | Piping Training System            |
### SOFTWARE DESIGN CAD/CAM/CAE DOMAIN

<table>
<thead>
<tr>
<th>SOFTWARE</th>
<th>CAM</th>
<th>PLM</th>
<th>LMS</th>
<th>CAD</th>
<th>VR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX-11</td>
<td>Tecnomatix</td>
<td>TeamCentre</td>
<td>Using TC</td>
<td>Manufacturing Fundamentals</td>
<td>Virtual Reality</td>
</tr>
<tr>
<td>Essentials for Designers</td>
<td>Advanced Simulation</td>
<td>TCUA Installation</td>
<td>TCUA Application &amp; Data Model Administration</td>
<td>TCUA Using TC</td>
<td></td>
</tr>
<tr>
<td>Sketching Fundamentals</td>
<td>Composite Structure &amp; Assembly</td>
<td>Modal Testing &amp; Analysis</td>
<td>Acoustics NVH Simulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synchronous Modelling Fundamentals</td>
<td>Advanced Finite Element Analysis</td>
<td>Acoustics Measurement &amp; Analysis</td>
<td>Multi Body Dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>Tecnomatix Process</td>
<td>Tecnomatix Integration for NX users</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drafting Essentials</td>
<td>Tecnomatix RobCAD</td>
<td>TCUA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate Design &amp; Assembly</td>
<td>Technomatix Process</td>
<td>Application</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Advanced Assembly Design</td>
<td>Flow</td>
<td>RobCAD</td>
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<td></td>
</tr>
<tr>
<td>Class A Free Form Modeling</td>
<td>Nesting</td>
<td>TCUA</td>
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<tr>
<td>Hull Design</td>
<td>Productivity Improvement</td>
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<tr>
<td>Engine Design</td>
<td>Dimensional Accuracy Control</td>
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</tbody>
</table>

### INDUSTRY 4.0

**Product Twin**

**ENGINEERING / ELECTRICAL / ELECTRONICS CONTROLS / DRIVES**

<table>
<thead>
<tr>
<th>AUTOMATION</th>
<th>PROCESS INSTRUMENTATION</th>
<th>ROBOTICS</th>
<th>CNC</th>
<th>MECHATRONICS</th>
<th>ELECTRICAL</th>
<th>PNEUMATICS &amp; HYDRAULICS</th>
<th>PUMPING, PIPING &amp; WELDING</th>
<th>ELECTRONICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC, Profibus, Profinet</td>
<td>Smart Instrumentation</td>
<td>Use &amp; Programming of Industrial Robots</td>
<td>840D sl</td>
<td>Mechatronics Concept Design</td>
<td>Induction Motors</td>
<td>Pneumatics</td>
<td>Pumping System</td>
<td>Radar Systems</td>
</tr>
<tr>
<td>HMI &amp; NETWORKING</td>
<td>PCS 7</td>
<td>Robotics Application</td>
<td>Milling, NC Programming</td>
<td>AC/DC Drives</td>
<td>Hydraulics</td>
<td>Piping System</td>
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<td></td>
</tr>
<tr>
<td>SCADA</td>
<td></td>
<td></td>
<td>Turning - NC Programming</td>
<td>Low Voltage SwitchGear</td>
<td></td>
<td></td>
<td>Welding</td>
<td></td>
</tr>
</tbody>
</table>

**SOFTWARE**

- NX-11
- TEAMCENTRE-11
- TECNOMATIX 14.0.2
- ROBCAD 11
- CADWIN
- SINUTRAIN
- PARAMARINE
- SAMIN
- TIA-PORTAL
- STARTER
- POWERCONFIG
- SIMOCODE PRO
- SIMATIC Manager

**HARDWARE**

- LMS SCADA
- 840D sl
- 808D MILLING/TURNING
- S7 1200 PLC
- S7 1500 PLC
- PCS 7
- KUKA ROBOT
- MECHATRONICS SYSTEM
- KEMPPI WELDING
- PROFIBUS/NET
- SINAMICS
- SIMOCODE SITRANS
- BARCO-3D
- OCULUS-RIFT

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