CENTRE OF EXCELLENCE IN MARITIME & SHIPBUILDING

COMPETENCIES, METHODOLOGY, EMPLOYABILITY & SKILLS

CREATING COMPETENCIES FOR INDUSTRY 4.0

SKILL DEVELOPMENT INITIATIVE OF GOVT OF INDIA

High end Engg, Software & Hardware Courses in Design & Manufacturing for Students & Industries, with the vision to facilitate transition to Industry 4.0

Centre of Excellence in Maritime & Shipbuilding (CEMS) is a dedicated Skill Development Centre in Maritime, Manufacturing, Automobile, Aerospace,Defence Production, Oil & Gas & Heavy Engineering Sectors.

Our Mission is

- **To bridge the skill gap between Students & Industry by providing advanced Skill training, facilitating better job opportunities & placements.**
- **To re-skill the employees to facilitate ready transition to Industry 4.0 & to make Industry more automatised & competitive.**

- *Strategically located in Vizag & Mumbai*
- *Section 8 'Not for Profit Organisation'*
- *Courses in advanced CAD/CAM/CAE, Simulation, Test & Optimisation Software, Digital Manufacturing & Hardware Technology*
- *Courses Certified by Siemens & IRCLASS*

COURSES ARE RELEVANT FOR THE FOLLOWING INDUSTRIES

DEFENCE

SHIPPING

AEROSPACE

OIL & GAS

HEAVY ENGG

AUTOMOBILE

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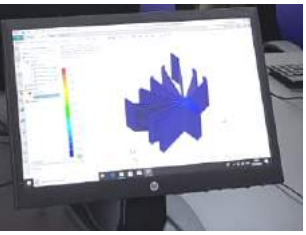
OUR PROMOTERS

IRCLASS Indian Register of Shipping

SAGARMALA PORT-LED PROSPERITY
Ministry of Shipping

SIEMENS
Technology Partner

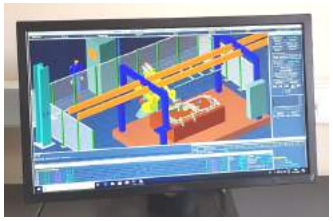
PRODUCT DESIGN & VALIDATION LAB



Product Design and Validation Lab would cover courses in Product Design & Validation for Manufacturing. The course will be modular, open, scalable with design and engineering solutions. It includes multi-physics simulations, static and dynamic stress analysis, Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA), thermal analysis, system-level dynamic analysis and composites.

Siemens NX-11

ADVANCED MANUFACTURING LAB



Advanced Manufacturing Lab offers courses for process design, simulation & Optimization of plant layout. DM allows engineers to create manufacturing process, in a virtual environment, including tooling, assembly lines,work centres, facility layout and ergonomics.
It helps to create 'Process Twin'.

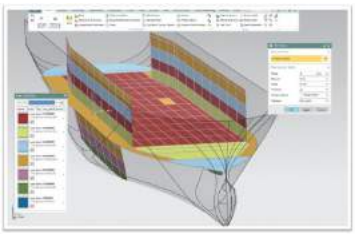
Siemens TeamCentre, Technomatix & RobCAD

TEST & OPTIMIZATION LAB

Siemens LMS Test Lab

This lab offers a unique combination of simulation software, mobile and lab testing systems & analysis in follw. areas
i.Vibrational Measurement & Model Testing
ii.Acoustics & NVH Simulator
iii.MultiBody & Structural Dynamics
LMS Test Lab offers you a complete, integrated solution for test-based engineering that combines high speed multi-channel data acquisition with full suite of integrated testing, analysis, and report generation tools.

DIMENSIONAL ACCURACY CONTROL SYSTEM



SAMIN

Students/ industry personnel would learn to analyze dimensional accuracy of steel structures, such as plant modules and shipbuilding blocks which are fabricated by modular construction technique and comparing it with 3D design.
Dimensional accuracy controls enables to correct errors,if any in initial construction phase itself.

NESTING PRODUCTIVITY IMPROVEMENT

CADWIN

Nesting software reduces wastage in steel plates by optimising use of steel sheets using Nesting s/w in CNC Machines, used to cut steel. It helps management of resources and work processes efficiently and by using integrated process for part and steel plate from design to production for manufacture industries including shipbuilding and plant, bridges and heavy machines, etc

HULL DESIGN

Siemens NX-11, PARAMARINE

Hull Design Software allows students to quickly create hull forms or any geometric shape within the software suite. Hull Generator provides the capability to rapidly define complex surfaces using a minimal number of curves. From these surfaces solid bodies can be formed.

AUTOMATION

S7 1200, S7 1500PLC

Automation Lab allows the students to understand the requirement and functioning of Programmable Logic Controllers (PLCs). This is the first step toward Internet of Things (IOT). Here the students learn how to Program Industrial PLCs, work with Industrial Human Machine Interface (HMI), Industrial SCADA (Supervisory Control & Distributed Acquisition) and PLC networking using Profibus and Profinet.

PROCESS INSTRUMENTATION

PCS 7

Process Instrumentation Lab imparts skills & knowledge on complete Process Automation & Process Instrumentation in all types of Process Industries.Students are trained on Distributed Control Systems & Configuration, Measuring Technologies for Pressure, Temperature, Level & Flow, Valve Positioning, selection of smart instrumentation & their integration with automation of system.

ELECTRICAL & ENERGY LABS

SIMOCODE

Electrical lab makes students explore fundamentals of Motors, Power Electronics, Electrical Drives & Low Voltage Switchgear. Participants are trained on basics of AC & DC Motors, Power Electronics Components, Speed control of AC/DC motors with Drives,Motor maintenance/servicing, Product selection based on application requirement, Diagnostic & troubleshooting strategies.

RESEARCH MACHINE SHOP

SINUTRAIN, 840D sl

CNC Controller Lab enables students to understand the concept of CNC Programming and work real Sinumerik 808D controller for Turning and Milling applications. The students will also get to work on the Sinumerik 840D sl rack which supports programming up to 31 Axis. This would enable students to program
complex jobs. The students can learn how to program and test the CNC Program using the Sinutrain software.

MECHATRONICS

Modular Mechatronics System

Mechatronics lab allows students to work on a mini factory like setup and on areas such as Pneumatics & Hydraulics, Sensors, Communication Protocol, PLC programming, PLC Networking using Profibus and Profinet. The Mechatronics Lab imparts expertise in the field of Mechatronics systems/processes. Students are trained on various Electrical, Mechanical, Pneumatics & E- Pneumatics, and component troubleshooting Techniques with System Approach. It benefit students from all streams to build knowledge in multiple domains.

ROBOTICS

KUKA ROBOTIC UNITS

Robotics Lab enables knowledge on:
i. Advanced manufacturing techniques
ii. Automation combined with advanced manufacturing technology
iii. Sequence Planning, Process Planning, Shop Floor Layout generation for robotic applications iv. Offline / On-line sequence execution techniques for robotics
v. Monitoring & Virtual simulation generation for sequences
vi.Offline programming of robotics controller.

VIRTUAL REALITY

OCULUS- RIFT, BARCO-3D

The capabilities of the Virtual Reality Lab would be Walkthroughs, Ergonomic reachability studies, High end data visualization, Interactive videos, Virtual Training.The areas where the virtual reality lab would be helpful for visualization are:
i. Design Walkthroughs
ii. Manufacturing planning iii. Outfitting validation
iv. DFA & DFM
v. MRO Analysis (Maintenance, Repair & Overhaul)

RADAR LAB

RADAR SYSTEM

Radar Training Lab combines real-world radar with the power of modern surveillance technology. It uses patented technology to detect and track passive targets at very short range in the presence of noise and clutter. The radar system is fully operational and covers principle of Pulse, CW Doppler, FMCW, Doppler & MTI radar etc.

PNEUMATICS & HYDRAULICS

PNEUMATICS & HYDRAULICS SYSTEM

Pneumatic Lab is capable of being used to demonstrate the design, construction and application of pneumatic components and circuits
i. Design & function of a pneumatic system
ii. Function & identification of pneumatic components and their symbols

Hydraulic Lab is capable of being used to demonstrate the design, construction and application of Hydraulic components and circuits..

WELDING PUMPING & PIPING

KEMPPI WELDING

Welding Lab will enable participants to develop a thorough understanding of key welding concepts to design and produce quality welds, reliably and economically.
Pumps/Piping Training Systems Lab familiarizes students with pump/pipe operational principles and associated maintenance tasks such as pump/pipe installation, lubrication, shaft alignment, inspection, & component replacement.

Customers with NX/Teamcenter as PLM backbone

CEMS

4 Wheelers	2 Wheelers	Tractors	Equipment	Others	Suppliers	Bearing
Maruti Suzuki	Bajaj	Escorts	Telcon	Crompton Greaves	Subros	NTN
Mahindra	Hero Honda	Sonalika International	JCB		Bosch	Timken
Tata		Swaraj	BEML	GE	Ceat	FAG
		Tafe	CAT	HAL		SNR
						GMN

COURSES OFFERED BY CEMS

SOFTWARE DESIGN CAD/CAM/CAE DOMAIN

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

Product Twin

Process Twin

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

ENGINEERING / ELECTRICAL /ELECTRONICS CONTROLS/ DRIVES

AUTOMAT -ION	PROCESS INSTRUMENT ATION	ROBOTICS	CNC	MECHA TRONICS	ELECTRICAL	PNEUMATICS & HYDRAULICS	PUMPING, PIPING & WELDING	ELECTRO- -NICS
PLC, Profibus, Profinet	Smart Instrumentation	Use & Programming of Industrial Robots	840D sl	Mechatronics Concept Design	Induction Motors	Pneumatics	Pumping System	Radar Systems
HMI & NETWORKING	PCS 7	Robotics Application	MILLING NC Programming		AC/DC Drives	Hydraulics	Piping System	
SCADA			TURNING - NC Programming		Low Voltage SwitchGear		Welding	

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