SIEMENS

CENTER OF EXCELLENCE (COE), JNTUA College of Engineering, Ananthapuramu

EXECUTION PARTNER

DesignTechSystems Ltd.

Dr.B. Durga Prasad

Chief Co-Ordinator, Siemens COE
Professor & Head of the department
Mechanical Engineering
JNTUA College of Engineering
ANATHAPURAMU

Dr.K. Prahlada Rao

Professor and Principal
JNTUA College of Engineering
ANATHAPURAMU

List of COE Laboratories	Lab in charge names for JNTUA
1. Product Design and Validation Lab	Mr. Syed Amjad
2. Advanced Manufacturing Lab	Mr. Anil Kumar H
3. Automation Lab	Ms. Y. Yasmeen Mirza
4. Electrical and Energy studies Lab	Mr. Poorna Chandra Rao Kasturi
5. Process Instrumentation Lab	Mr. Poorna Chandra Rao Kasturi
6. Mechatronics Lab	Ms. Y. Yasmeen Mirza
7. Test and Optimization Lab	Mr. Basavaraj M C
8. CNC Programming Lab	Mr. Sai Kiran
9. CNC Machine Lab	Mr. Sai Kiran
10. Rapid Proto Typing lab	Mr. Syed Amjad
11. Robotics Lab	Mr. M.K.Sri Datta
12. Automotive Body Repair Lab	
13. Automotive Paint Lab	
14. Lift Installation and Maintenance Lab	

1.Product Design and Validation Lab
NX for Digital Product Development

This Lab is fully associative CAD-CAE-CAM applications, NX touches the full range of development processes in product design, simulation and manufacturing

Features of the Lab:

Product Design and Validation Lab introduces to the following Modules using NX CAD, NX CAE.

- ➢ Basic Design, Modelling, Drafting, Sheet Metal Design, Assembly and Industrials Design
- ➢ Advanced Simulation Process and Solution
- ➢ Finite Element Analysis

Fig1: Mr. J A Chowdary, Advisor IT and Special Chief Secretary to Chief Minister, Govt. of AP along with Mr. Ravi Ayyagari, UGC Nominee, JNTU, Anantapur. Visited Product design and Validation lab, Siemens COE, JNTUA.

Fig 2: Product Design & Validation Lab

Significance of the Lab:

This Lab is suited for designers, engineers, manufacturing engineers, application programmers, NC programmers, CAD/CAM managers, and system managers who need to manage and use NX

- ➢ NX CAD provides leading-edge solutions for design that improve productivity throughout product development
- ➢ NX CAE is the use of computer software to simulate performance in order to improve product designs or assist in the resolution of engineering problems for a wide range of industries. This includes simulation, validation, and optimization of products, processes, and manufacturing tools

2.Advanced Manufacturing Lab

Planning Capabilities, Simulation Capabilities and Production Capabilities

Features of the Lab:

Advanced manufacturing Lab is introducing NX CAM, Teamcenter, Digital Manufacturing applications.

Fig3: Mr. J A Chowdary, Advisor IT and Special Chief Secretary to Chief Minister, Govt. of AP along with Mr. Ravi Ayyagari, UGC Nominee, JNTU, Anantapur. Visited Advanced Manufacturing Lab, Siemens COE, JNTUA.

Fig 4: Advanced Manufacturing Lab

Significance of The Lab:

Advanced Manufacturing Lab Helps participants to Learn NX CAM, PLM, Rob CAD, Process Designers and Process Simulation and the significance of the Course explained Below.

➢ NX CAM software provides a wide range of functionality, from simple NC programming to high-speed and multi-axis machining, enabling you to address many tasks with one system. The flexibility of NX CAM software means that you can easily complete the most demanding jobs.

➢ PLM software allows companies to manage the entire lifecycle of a product efficiently and cost-effectively, from ideation, design and manufacture, through service and disposal. Computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE), product data management (PDM) and digital manufacturing converge through PLM.

➢ Digital manufacturing systems allow manufacturing engineers to create the complete definition of a manufacturing process in a virtual environment,

including **Tooling, Assembly Lines, Work Centres, Facility Layout, Ergonomics**

3.Automation Lab

Features of the Lab:

➢ This Lab has equipped with PLC (S7-1200 and S7-300), SCADA and HMI Panels with Accessories.
➢ This Lab is fully integrated with Electronic, Electrical and Process instrumentation applications

Fig 5: Automation Lab

Significance of the Lab:

After successfully completing this course, Participants can be able to,

➢ Understand Automation & System Overview, Engineering Software TIA Portal.
➢ Understand Different Logic Gates, Circuit diagrams, Timers, Counters, FC's, OB's, DB's and PLC Tags.
➢ Write Ladder program for various applications
➢ Communicate between PLC's
➢ Understand Control Strategies
➢ Configuration, Interface of Engineering System.

- ➢ Create Alarm Configuration, Trends.
- ➢ Create user administration.

4.Electrical and Energy Studies Lab

<u>Features of the Lab</u>:

- ➢ This Lab has equipped with AC Drives (Sinamic G120), DC Drive (Sinamic 6RA80), Soft starter panel(3RW44), Energy Saving Kit, ACB's (3RT-4000 Amp and 3WL-6630 Amp), Star-Delta Kit, Type two Coordination System, Timer and Relay Kit, SIMOCODE (Sirius Motor Management Control Device), MCB's, RCCB's, MCCB's, Switch Disconnectors, Contactors,
- ➢ OLR's (Over Load Relays), MPCB's (Motor Protection Circuit Breaker), PAC Meters,
- ➢ This Lab is fully associate the Electronic, Electrical and Process instrumentation applications.

Fig3: Electrical and Energy Studies Lab

Significance of the Lab:

After successfully completing this course, Participants can be able to,

➢ Power and control wiring of drives, Communicate Drives with STARTER Software, Parameterization/Configuration of drives, Troubleshooting of Drives

➢ A). To understand the nameplate details of Induction Motors. B). To do the Installation, Maintenance & Control of Induction motor. C). To do the Assembling and Dismantling of Induction Motor. D). To do the Testing of Induction Motor. E). To do the Overhauling of Induction Motor. F). To Configure SIMOCODE.

- A). Identify switchgear and its ratings). Rack breakers into or out of connected position safely, C). Locate close and trip coils and motors). Interpret Siemens schematics and wiring diagrams, E). Configure Soft starter, F). Configure PAC meter). Start the Induction motor with different starting methods). Understand the Construction, I). Characteristics and operation Various Low Voltage Switch Gear.

- A). Get Brief Idea on Power Generation, Transmission and Distribution, B). Understanding of Different types of Earthing Systems and Cable dimensioning, C). Understand Type of Faults and protection). Get a Brief Idea of SIMARIS DESIGN, E). Create electrical Single Line Diagram(SLD) and Analysis on it by SIMARIS.

5.Process Instrumentation Lab

<u>Features of the Lab</u>:

- This Lab has equipped with Pressure Transmitter (SITRAIN P300), Differential Pressure Transmitter (SITRAIN PDS-111), Temperature transmitter (SITRAIN TH400), Flow Transmitters (SITRAIN Mass 6000, SITRAIN Mag 5000 and SITRAIN FUS 060), Level Transmitters (SITRAIN LR250, SITRAIN LU and SITRAIN CLS 200), Valve Actuator (SITRAIN PS2) and Distributed Control System (Siemens PCS-7)
- This Lab is fully integrated With Electronic, Electrical, Chemical and Process instrumentation applications

Fig3: Process Instrumentation Lab

Significance of the Lab:

➢ A). Understand PCS7 hardware & software). Configure a typical project, C). Program using STEP7 editors like CFC charts, D). Understand and use of SFC, E). Operator control and monitoring using Win CC, F). Configure Multi Project, G). Communications between the S7 and WINCC, H). PCS7 tag database, I). Building Win CC screens

➢ A). Learn the principles of flow, Level, Pressure, Temperature measurement B). Identify the components and performance characteristics of Different Process Instruments, C). Obtain and understand the principle of operation, selection and sizing of various Process Instruments, D). Learn specifications, range, hardware / constructional details and features of the product, E). Parameterize different Process Instruments for different configurations

6.Mechatronics Lab

Features of the Lab:

➢ This Lab is equipped with MAPS 6S (Modular Automation Production System with 6 stations) with Compressors for Pneumatic supply.
➢ And also, Siemens PLC S7-1200
➢ This Lab is fully integrated with Electronic, Electrical, Mechanical, Pneumatic and computer integrated components.

Fig3: Mr. J A Chowdary, Advisor IT and Special Chief Secretary to Chief Minister, Govt. of AP along with Mr. Ravi Ayyagari, UGC Nominee, JNTU, Anantapur. Visited Mechtronics Lab, Siemens COE, JNTUA.

Fig3: Mechatronics Lab

Significance of the Lab:

After successfully completing this course, Participants can be able to

- ➢ Approach any kind of Mechatronics Systems
- ➢ Identify the different kinds ofElectronic, Electrical, Mechanical, Pneumatic and computer integrated components.
- ➢ Troubleshoot the any Mechatronics System by tracing the energy, Mass and the information flow.
- ➢ And also Write the PLC program for individual modules as well as the entire system.
- ➢ Interface PLC's of different modules.

7.Test & Optimization Lab

Features of the Lab:

This Lab introduces LMS Test Lab and LMS Virtual Lab

Fig5: Mr. J A Chowdary, Advisor IT and Special Chief Secretary to Chief Minister, Govt. of AP along with Mr. Ravi Ayyagari, UGC Nominee, JNTU, Anantapur. Visited Test and Optimization Lab, Siemens COE, JNTUA.

Fig 6: Test & Optimization Lab

Significance of the Lab:

> ➢ LMS Virtual Lab is an integrated suite of 3D FE and multibody simulation software which simulates and optimizes the performance of mechanical systems for **structural integrity, noise and vibration, system dynamics and durability**
> ➢ LMS Test Lab offers to Participants a complete, integrated solution for test-based engineering that combines high speed multi-channel data acquisition with a full suite of integrated testing, analysis and report generation tools.

8.CNC Programming Lab

Features of the Lab:

This Lab has equipped with SINUMERIC 808D Turning / Milling, SINUMERIC 840D SL Controllers.

Fig7: Mr. Soon Du Park, Senior General Manger, Employee Relations Department, KIA Motors India. Visited CNC Programming and Machine Lab, Siemens COE, JNTUA.

Significance of the Lab:

CNC Programming Lab Helps Participants to learn,

> ➢ CNC Turning Numerical control programming and Milling Control Programming on Sinumeric 808D controllers.

9.CNC Machine Lab

Features of the Lab:

       CNC Machine Lab Consists of 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 Manufacturing System.

Fig9: Mr. Soon Du Park, Senior General Manger, Employee Relations Department, KIA Motors India. Visited CNC Programming and Machine Lab, Siemens COE, JNTUA.

Fig 10: CNC Programming and CNC Machine Lab

Significance of the Lab:

After successfully completing the Course of CNC Controllers, Participants can be able to perform the activities on CNC Turning Machine and also Milling Machine.

10.Rapid Prototyping Lab

Features of the Lab:

This Lab has equipped with 3D Printing Machine (Company name: Stratasys) with Accessories.

Fig 10: Rapid Prototyping Lab

Significance of the Lab:

College and universities with 3D printing technology can prepare students for a workforce that demands sharp critical thinking and collaboration skills. The right technology attracts not only bright students, but also talented faculty and valuable industry partners, leading to valuable business partnerships that can give vital real-world experience.

11.Robotics

Features of the Lab:

This Lab Consists of

- Material HandlingRobot (ABB IRB 140) and controller (IRC5)
- Spot Welding Robot (ABB IRB 6700) and controller (IRC5)
- Arc Welding Robot (ABB IRB 1520ID)and controller (IRC5)

Fig5: Mr. J A Chowdary, Advisor IT and Special Chief Secretary to Chief Minister, Govt. of AP along with Mr. Ravi Ayyagari, UGC Nominee, JNTU, Anantapur. Visited Robotics Lab, Siemens COE, JNTUA.

Fig 10: Robotics Lab

Significance of the Lab:

This Lab is suited for designers, engineers, manufacturing engineers, application programmers, Process Engineers, CAD/CAM managers, and Robotic Technicians and Scientists who need to manage Robots for industries.