



Key notes on the centre :

- ▶ The "Centre of Competence in Automation Technologies" is a joint initiative of Bosch Rexroth with Bapatla Engineering College.
- ▶ The centre will act as an independent centre, for all the technical institutes.
- ▶ The primary objective of the centre is to bridge the gap between the Industries and the Institutions.
- ▶ The centre will function on the concept of Institute in an Institute concept.
- ▶ Centre will cater to the needs of Engineering Colleges, Polytechnics, ITIs and Vocational courses.
- ▶ The centre has its own faculty, trained by Bosch Rexroth both in India and in Germany.
- ▶ The curriculum is developed by Bosch Rexroth, which will bring the students to the level of technology found in the modern industries.
- ▶ The centre will focus on "Hands on Training" to the students and faculty members in the region in the field of automation.
- ▶ The centre will also offer the projects to the students in the automation field.
- ▶ Automation technologies are found in most of the industries - Automotive, Machine tools, Manufacturing, Process industries, Renewable energies, Aerospace, Metallurgy, Power.
- ▶ Centre will offer projects to the students of Engineering.
- ▶ Successful candidates will be offered a "Joint Completion Certificate" by Bosch Rexroth and Bapatla Engineering College.



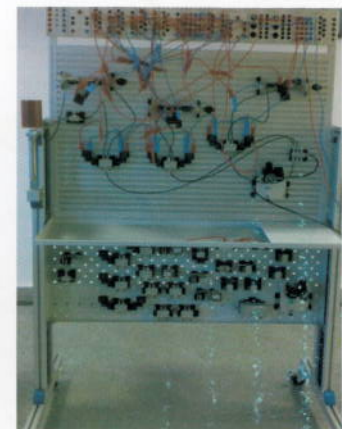
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Centre of Competence In Automation Technologies



Hydraulics :

Basic Hydraulics – Course Content

- ▶ What is 'Hydraulics'?
- ▶ Physical fundamentals and principles



- ▶ Hydraulic components (pumps, motors, cylinders, valves: directional, pressure, flow; accessories)
- ▶ Fluid power symbols as per DIN ISO 1219
- ▶ Basic hydraulic circuits
- ▶ Instructions, guidance, and review for practical hydraulic aspects
- ▶ Techniques of assembly, disassembly and conversion; possibilities for handling and setting of typical components
- ▶ Practice by self-trial of circuit making on demonstration power pack
- ▶ Instructions on storage, commissioning, trouble shooting, maintenance and safety
- ▶ Overview of proportional hydraulic technology

Proportional Hydraulics - Course Content

- ▶ Brief review of conventional valves
- ▶ Theoretical aspects of proportional hydraulics
- ▶ Component design of :
 - proportional directional, pressure and flow control valves
 - directional servo and pressure servo valves and electro hydraulic
- ▶ Controls for pumps
- ▶ Symbols as per DIN ISO 1219
- ▶ Electronic controls, PLC applications
- ▶ Typical continuous control hydraulic circuits
- ▶ Instruction on commissioning, filtration, maintenance and Servicing (with videos on proportional valves and servo valves) and trouble shooting

Pneumatics :



Course Content

- ▶ Elements in a Pneumatic System
- ▶ Air Preparation & Distribution
- ▶ Cylinders & Valves Their working and interactions
- ▶ Electro-Pneumatic Control Technology
- ▶ Pneumatic & Electro-Pneumatic Latches and their applications
- ▶ Pneumatic & Electro-Pneumatic Circuits with practical aspects
- ▶ Maintenance & trouble shooting
- ▶ Safety aspects.

Mechatronics :



Course Content

- ▶ Overview of hydraulics, pneumatics, electronics
- ▶ Concept of assembly and conveying systems
- ▶ Configuring of mechanical equipment and electronic controls for assembly and conveying systems
- ▶ PLC technology and programming

Electric Drives & Controls :

Course Content

- ▶ Introduction to Rexroth Automation Products - Electric Drives and Controls
- ▶ Types of PLCs , HMIs, Drive and CNC systems
- ▶ Applications - Introduction
- ▶ Installation of Indraworks and VI-Composer

PLC L10 & L20

- ▶ Introduction to Indraworks and basic setup Indraworks / Indralogic settings
- ▶ Elements of POU - PRG/FB/FUN
- ▶ Programming languages - LADDER / Function block diagram/ Instruction list / Structure text
- ▶ Variables declaration - Local and Global variables
- ▶ Subprograms calling and program download & upload
- ▶ Memory structure and export and import of project data
- ▶ Task configuration and project archiving

Motion Logic in the Drive – MLD

- ▶ Introduction to Indradrives
- ▶ Drive parameterisation
- ▶ Introduction to drive inbuilt PLC
- ▶ PLC Open function blocks
- ▶ Axis Structure
- ▶ Reading and writing drive parameters using FBs
- ▶ Direct access variables
- ▶ IO configuration on CCD (Master <--> Slave)
- ▶ Synchronization Reading drive trouble shooting manual
- ▶ VCP communication

CNC - MTX Micro

- ▶ Introduction to CNC system
- ▶ Creating the project
- ▶ Configuration
- ▶ Drive parameterization
- ▶ Introduction to channel and axis gateway signals - NC to PLC and PLC to NC signal & PLC Logic Structure
- ▶ Manual mode explanation and error messages
- ▶ Introduction of M-Codes , G-Codes
- ▶ Part Programming ,Subroutines ,Standard Cycles

