

Sensorics Technology

Learning Goals

- To Illustrate the fundamentals of most commonly used analog and digital sensors
- To learn integration with other products relating to Hydraulics, Pneumatics and PLCs



Sensor Technology has emerged as a key technology to deploy Industrial Automation solutions. Scientific and technical innovation is now increasingly linked with the term sensor. There are few problems today in data acquisition that cannot be solved using sensors. For that reason, sensors occupy a prime position in the broad field of factory automation and in many other applications like in construction, utilities, building management and office equipment etc.

BOSCH Rexroth sensorics trainer, fitted with Pepperl & Fuchs industrial sensors, provides opportunity to work on practical exercises and gain specialized technical knowledge about characteristics of each sensor.



Drives and Control Systems

Learning Goals

- To impart basic knowledge of electric drives and controls
- To learn compact, simple, powerful and low-cost CNC concepts for standard turning and milling machines
- To learn online & offline programming of PLC to control industrial process

Drive and Control technology enhances the power, flexibility and performance of a wide range of machine functions. Main challenges such as energy efficiency, mobility and security are best answered by drive and control technology. Intelligent drives help the machine OEMs to satisfy the demands of today's complex single and multi-axis production systems.

Machine Drive System

BOSCH Rexroth WILD platform provides state-of-the-art learning opportunity through combined motion and PLC functions to form a modern open automation platform for modular machine designs. The MLD trainer offers:

- Open/scalable format and multiple communication possibilities
- Simplified engineering with technical function block
- Drive-integrated motion-control, use for simple single/multi-axis control
- Certified safety technology



CNC Control System

CNC system Improves productivity and flexibility, BOSCH Rexroth- MIX platform provides an open, scalable, comprehensive CNC control system for most demanding cutting, forming and machining applications. State of Art trainer featuring a sophisticated array of performance data and reporting functions, and open technology enables to scale from individual machine to control a networked system for large-scale production.



Programmable Logic Controller

Process automation is achieved by an industrial controller, PLC. Whether the process is too fast, slow, small, big, cold, hot or just too dangerous for humans, the controller makes up the brain of the entire process to schedule and control the sequence of machines.

The powerful Bosch Rexroth PLC trainer system has Analog I/O which could be used to test PID loops and other variable functions. The L20 PLC controller may be connected via an Ethernet Switch with external devices, which can be used to learn the ability to program both products from a single ethernet connection. The ethernet switch has extra ports which can be used to connect additional HMIs, to demonstrate OPC connectivity to SCADA software.



COURSES OFFERED

The centre of competence offers following courses :

- Automation Technologies - **Basic** (40 Hrs)
- Automation Technologies - **Intermediate** (80 Hrs)
- Automation Technologies - **Advance** (120 Hrs)

Faculty

Faculty conducting training programs has adequate knowledge and practical exposure of cross disciplinary technologies. Expert faculty members from different engineering backgrounds have been inducted and trained by BOSCH Rexroth to conduct these training programs and carry out research work.

Participants

Courses are multidisciplinary in nature. Student of B.Tech, Second, Third, and Final year from any engineering discipline are eligible to participate in the program.

Teaching and Learning Media

- Multimedia Presentation
- Cut sections / Transparent Models
- PC Animations
- Circuit simulation on trainer kit
- Exclusive Training Manual

Intake : 15 Seats / program

Mode

- Regular : Mon - Fri, 9.00 am to 5.00 pm
- Part time : Mon - Fri, 4.00 pm to 7.00 pm
- weekend : Sat - Sun, 9.00 am to 5.00 pm

Evaluation

Through Online test conducted after the course

AKGEC-BOSCH Rexroth

Centre of Competence-Automation Technologies

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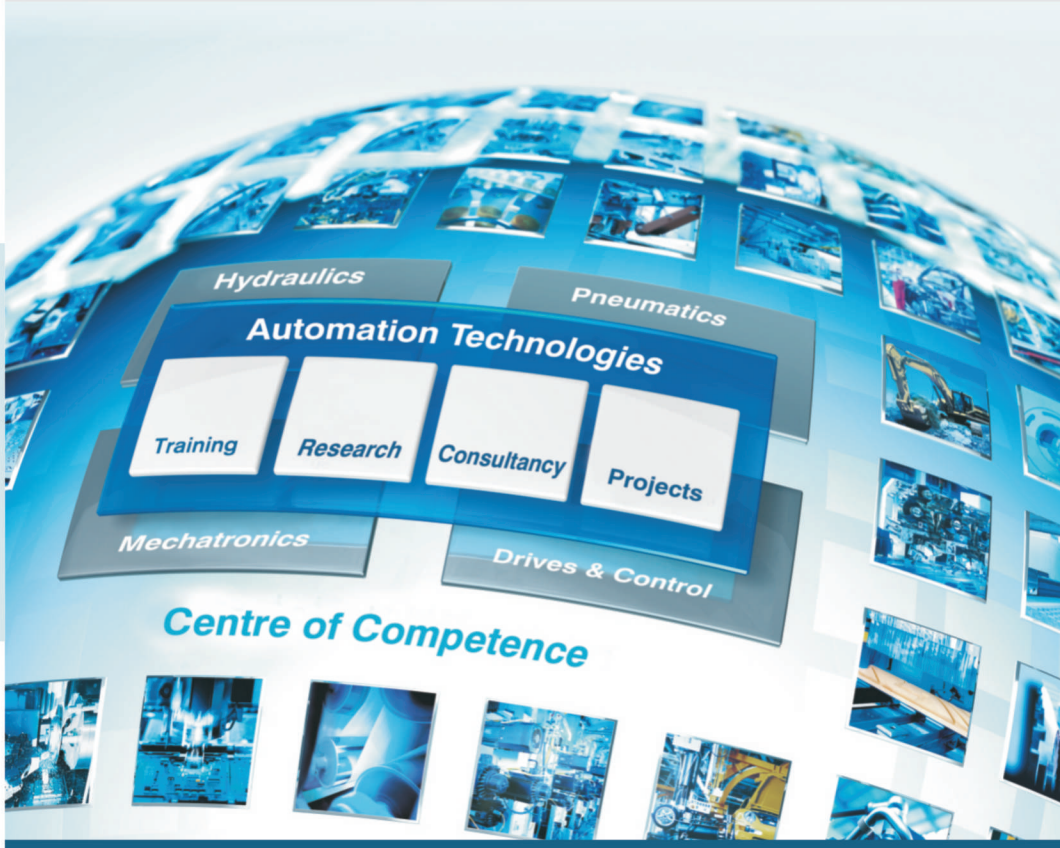
Hydraulics and
pneumatics

Sensorics
Technology

Programmable Logic
Controllers

Mechatronics

Drives & Control



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**AKGEC-BOSCH Rexroth
Centre of Competence - Automation Technologies**

The modern manufacturing systems need trained manpower with a broad based education and training, being able to look beyond the borderlines of traditional engineering disciplines. The multidisciplinary field of Industrial Automation has therefore become the most critical technical training discipline in the world of vocational training and education. While the industry needs trained man power, the academic institutions also face the onerous task of gearing up their curriculam and laboratories to international standards. It is, therefore, imperative that the industry, and the academia join hands to bridge the existing gap.



About the centre

Ajay Kumar Garg Engineering College, Ghaziabad has established AKGEC-BOSCH Rexroth Centre of Competence in Automation Technologies in collaboration with Bosch Rexroth AG, Germany.

The primary objective of the centre is to bridge the technological gap and focus on training and research programs which will help in catering to the growing demand from engineering and manufacturing industries in India. This Centre is an initiative to prepare young engineering graduates to meet current industry demand for the global challenges in manufacturing sector.

The Centre has world class infrastructure with state of the art technologies, equipments, training kits, hardware, software and teaching aids with excellent faculty trained by Rexroth Germany. The center has six laboratories at par with international standards on Hydraulics, Pneumatics, Sensorics, PLCs, Drives & Control and Mechatronics.

The centre aims to provide training to under graduate and post graduate students as well as industry professionals to meet industry requirements. These trainings will enhance the competency levels of students for better employability. Successful students / participants will be awarded joint certificate of AKGEC & BOSCH Rexroth.



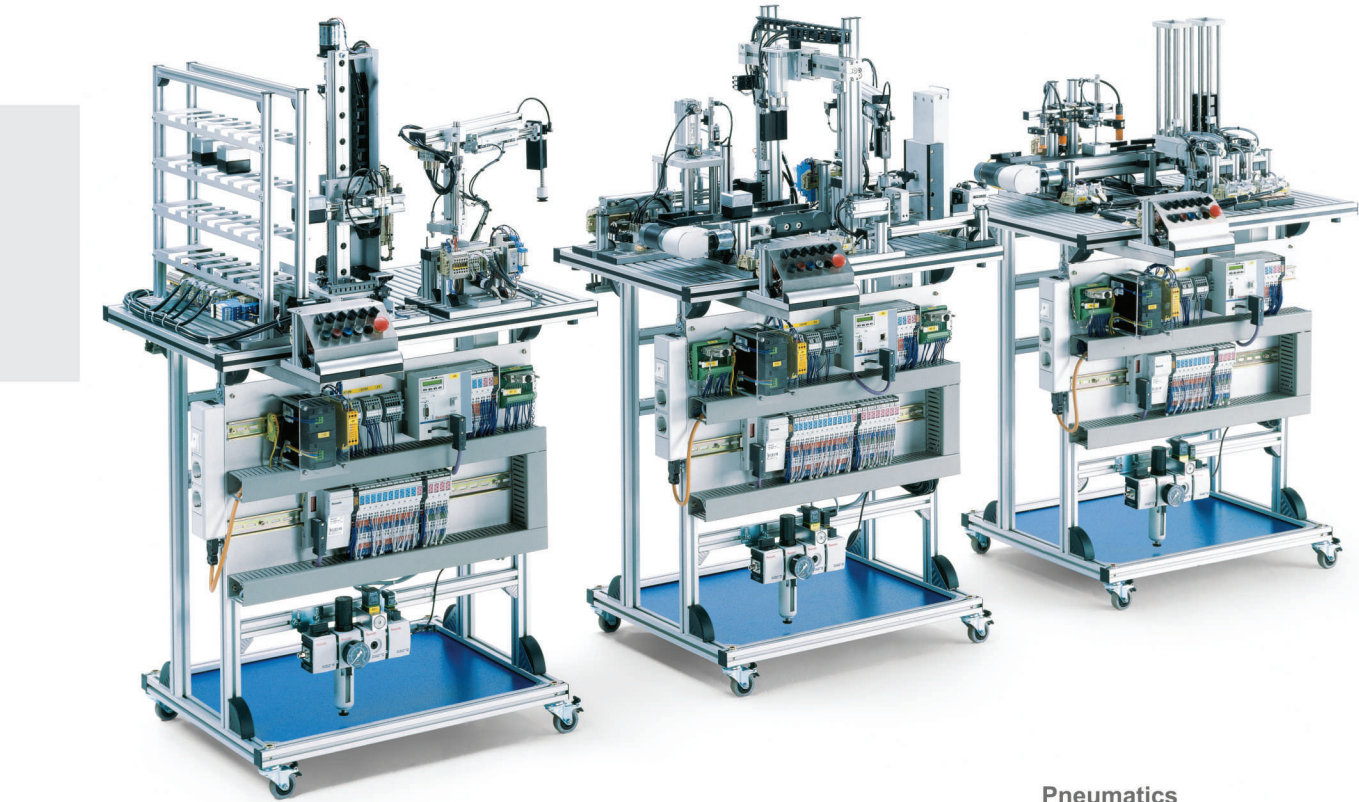
About AKGEC

Ajay Kumar Garg Engineering College, Ghaziabad is affiliated to U.P. State Technical University, UPTU, and is approved by the All India Council for Technical Education. The college was established in 1998 and offers B. Tech Courses in seven disciplines of Engineering. The college also offers postgraduate course in Computer Applications (MCA) and M. Tech in six disciplines. The college is accredited by NBA and certified for ISO 9001-2008 by BSI, UK.

The college has been consistently maintaining excellent academic results and has the distinction of being the first and only college in UP to receive the Academic Excellence Award for the Best Engineering College in UPTU from H.E., the Governor of UP for two successive years.

About BOSCH Rexroth

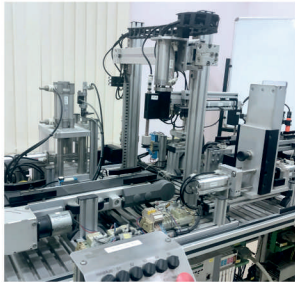
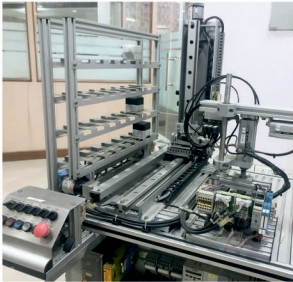
Bosch Rexroth is one of the world's leading specialists in the field of drive and control technologies. Under the brand name of Rexroth the company supplies more than 500,000 customers with tailored solutions for driving, controlling and moving. As The Drive & Control Company, Bosch Rexroth develops, produces and sells components and systems in more than 80 countries in the technology fields like Electric Drives and Controls, Industrial Hydraulics, Mobile Hydraulics, Linear Motion and Assembly Technology and Pneumatics.



Mechatronics

Learning Goals

- To analyze functional relationships in emerging Mechatronics systems integrated with electrical, mechanical and computer systems.
- To provide the skill sets required in today's manufacturing environment.



Automated systems are found in almost every industry today. With BOSCH Rexroth Modular Mechatronics systems, students gain insight into the use of automation technology in a production environment. The three mechatronics stations of a cube assembly comprising of Magazine, Pneumatic Press and Storage system represent simplified models of typical production process found in most automated factories. The state-of-the-art technology confirms an emphasis on effective, interesting and lively training in this field.

Pneumatics

Learning Goals

- To be able to understand the physical parameters, symbols, construction and function of pneumatic components
- To be able to read, analyze and understand pneumatic circuits
- To be able to make, operate and test Pneumatic circuits on the Training Rig



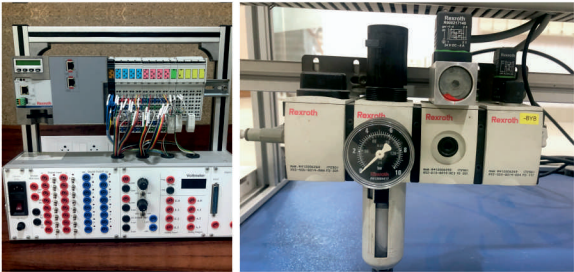
Hydraulics

Learning Goals

- To understand the physical parameters, symbols, construction and functioning of hydraulic components
- To be able to read, analyze and understand hydraulic circuits
- To be able to make, operate and test hydraulic assemblies on the Training Rig.

Hydraulics with its wide application base in almost all engineering domains has an important role in the contemporary industrial world. Whether it is a case of raising or lowering loads smoothly, undertaking linear or rotational movements, achieving even acceleration or accurate positioning, maintaining preset speeds, transmitting power or linking motion sequences - in fact wherever economical power is required, hydraulics comes into its own.

The BOSCH Rexroth modular state of the art Hydraulic training system is based on standard components from various Bosch Rexroth product areas. This system facilitates learning of On/Off Hydraulics, Proportional, Mobile Hydraulics and PLC Controller. By means of the training systems, both newcomers and advanced users work on practical exercises and gain specialized technical knowledge.



Pneumatics is all about using compressed air to make a process happen. Designing, constructing and reading pneumatic diagrams gives a strong understanding of circuit operation and a good base for trouble shooting. Pneumatic signals are used to control final control elements because such signals can be used to actuate large valves and other high power control devices. Using pneumatic powered tools results in lower weight and costs compared to electric or hydraulic controlled tools.

The BOSCH Rexroth modular state of the art Pneumatic training system is based on standard components across the Bosch Rexroth product range. This system facilitates learning of Basic Pneumatic & Electro-pneumatic concepts. A training system comprising of hardware and software enables both inexperienced and experienced users to work on practical exercises and gain specialized technical knowledge.