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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### Event: "Industrial Visit to XP Robotics"

**Venue:** Agrahara, Bommanahalli, Bengaluru **Date:** 14/11/2026




On 14th November 2026, the Department of Computer Science and Engineering at New Horizon College of Engineering organized an industrial visit to XP Robotics, located in Agrahara, Bommanahalli, Bengaluru, for the 3rd semester students. The visit was scheduled from 10:00 AM to 03:00 PM. The objective was to provide students with practical exposure to robotics, artificial intelligence, machine learning and the emerging field of Physical AI.



## About XP Robotics

XP Robotics, located in Bengaluru, works in the field of robotics and intelligent automation. The visit offered students an opportunity to observe robotic platforms and understand how mechanical systems, electronics, sensors, control algorithms and artificial intelligence are integrated to perform physical tasks. The demonstrations connected classroom concepts with practical applications in robotics.

## Overview of the Visit

The session introduced students to the relationship between machine learning and physical robotic systems. The team explained how robots use data, sensors, actuators and control software to perceive their surroundings and carry out tasks. Students were introduced to supervised learning, unsupervised learning and reinforcement learning. Particular attention was given to reinforcement learning, in which a system improves its actions through feedback, rewards and repeated attempts.

## Robotic Manipulation and Object Handling

Students also explored robotic gripping mechanisms and object handling, including demonstrations involving picking up objects such as bottles. The session showed how coordinated movement, sensing and grip control are required for a robot to interact with objects. It also reinforced the importance of selecting an appropriate gripping force depending on the size, shape and fragility of the object.



## Sensors, LiDAR and Autonomous Navigation

The role of LiDAR and other sensors in helping robots understand their surroundings was explained. LiDAR measures distances to nearby objects and supports obstacle detection and navigation. Students also explored differential-drive movement and how wheel speeds affect a mobile robot's direction. Equal velocities on both wheels result in straight-line motion, different velocities cause the robot to turn, and negative velocity enables reverse movement. This demonstration connected basic principles of motion with practical robot navigation.

## Hands-on Demonstration: Leader–Follower Robotic Arms

One of the most engaging activities was the leader–follower teleoperation demonstration. Students operated a leader arm, while a follower arm replicated its movements. The setup was used to demonstrate a pick-and-place task in which the robotic arm could be guided to pick up a block and place it inside a box. The activity illustrated how human movements and demonstrations can be used to guide robotic systems in carrying out physical tasks.



## Humanoid Robotics, Motors and Balance

Students observed a bipedal humanoid robotic platform and learned about the role of motors, actuators, joints and degrees of freedom (DoF) in producing coordinated movement. The discussion highlighted that walking and balancing require more than simply moving the legs. A robot must coordinate multiple joints, monitor its body position and continuously adjust its movements to maintain stability. This provided insight into the mechanical and control challenges involved in humanoid locomotion.

## Industrial Applications of Robotics

The visit provided an introduction to practical industrial applications of robotics, including conveyor-belt automation, material handling and robotic welding. These applications demonstrate how robotic systems can assist with repetitive, structured and precision-oriented tasks in manufacturing and other industrial environments. The discussion helped students understand that robotics extends beyond humanoid platforms into a wide range of industrial processes.

## Learning Outcomes

The visit helped students connect classroom concepts in artificial intelligence, machine learning, mechanics and control systems with practical robotic applications. Students gained a better understanding of how sensors, motors, software and training data work together in physical AI systems. The interactive demonstrations, particularly the leader–follower robotic arm activity and the mobile robot navigation explanation, made the session engaging and helped students appreciate the challenges involved in developing robots that can perceive, move and manipulate objects in real-world environments.

## Conclusion

Overall, the industrial visit to XP Robotics was an informative and enriching learning experience. It provided valuable exposure to current developments in robotics and helped students appreciate the integration of artificial intelligence with physical machines. The visit encouraged curiosity, practical thinking and a deeper interest in robotics and emerging AI technologies.



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