



# Educationtimes

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## ROBOTICS HAS FOUND APPLICATION IN VARIOUS AREAS AND CAN BE A FASCINATING CAREER CHOICE, SAYS AMIT KR CHANDA

IS ROBOTICS' engineering all about designing robots, maintaining them, developing new applications and conducting research? If that's the case, then you need a re-thinking on the whole concept behind developing robots. So, what is a robot? The word 'robot' has been derived from a Czech word 'Robit', which means 'work' and a Slav word 'Robota', which means 'menial' or 'slave labour'. According to the associate professor at the mechanical engineering department of the Indian Institute of Technology, Delhi (IITD), Subir Kumar Saha, "The International Standard Organisation, however defines a robot as an automatically-controlled reprogrammable, multi-purpose manipulative machine, with or without locomotion, for use in industrial automation applications."

It's, however, a known fact that robots are not widely used by Indian companies. Out of about 600 to 700 robots widely in use in our country, most are used in engineering colleges and research-related institutes. "Robots are built to work repeatedly and accurately even in hazardous environments. They are programmed in a way that enables them to operate automatically. That's why a robot is called a re-programmable machine," Saha remarked.

According to Saha, "In India, studies related to robot technology and its implications are conducted by the Department of Science and Technology (DST) and Department of Scientific and Industrial Research. The research and development thrust is carried out by DST, Department of Electronics and Department of Ocean Development. IITs too have taken the lead in designing programmes in robotics."



IN FOCUS

# Engineering intelligence



### Institutes running programme in robotics' engineering

- Departments of mechanical engineering, electrical engineering and computer science at IIT- Bombay, Delhi, Kanpur, Kharagpur, Madras and IISc
- All the seven IITs in Delhi, Kanpur, Bombay, Chennai, Kharagpur, Guwahati and Roorkee
- The Centre for Robotics and Mechatronics at IIT Kanpur runs master's programme in robotics. A programme in robotics can be pursued from several departments of the institute, such as the departments of computer science and engineering, mechanical and electrical engineering in the institute
- National Institutes of Technology
- The University of Hyderabad - M Tech Artificial Intelligence and Robotics
- Jadavpur University, Kolkata - ME Robotics
- Birla Institute of Technology and Science, Pilani - ME Computer Science (robotics as a special subject)
- Sri Sathya Sai Institute of Higher Learning, Prasanthinilayam - M Tech
- Computer Science with specialisation in Artificial Intelligence
- PSA College of Technology, Coimbatore - Mechanical (robotics as an elective subject)
- Central Manufacturing Technology Institute
- Centre for Artificial Intelligence and Robotics

At IITD, the mechanical engineering department has taken the lead in developing models of robots. Saha elaborated, "Even in robotics, you have different areas of specialisation. For example, a student who specialises in designing and control, in robotics is close to mechanical engineering. If you want to specialise in control and hardware design of robots, a B Tech degree in electrical or electronics' engineering holds the key. A computer design programmer can look at hardware design in robotics. The control part of the robot is all about certain aspects of electrical engineering." **> More on page 2**



# ENGINEERING INTELLIGENCE

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In the Indian system, 'robotics' is quite often considered as the synonym for 'unemployment'. This is supposedly because of the fear that robots will replace human workers. However, surveys conducted by the government and private agencies reveal that the fear is unreal. "In fact, robots enhance the job quality, productivity, product quality, profitability and safety of workers, particularly for those who work in hazardous environments. Japan has the largest number of robots and only 3 per cent of the workforce is unemployed there. Robots cannot be a reason for unemployment." He added, "The use of robots creates jobs and people who are working manually can be rehabilitated in different areas through training. Even, robots require maintenance, programming and design change. So, if you rehabilitate the displaced workers and

train them in handling different aspects of robots, it will lead to increased productivity."

## **Employment**

A specialisation in robotics' engineering will lead to potential career opportunities in manufacturing, research and engineering, agriculture, mining, nuclear power-plant maintenance and a variety of other areas. "If you consider a robot as a machine, which can perform numerous tasks, it could act as a catalyst for a change in our everyday life," Saha said. One of the great ways to learn about robotics is to take part in robotics' competitions. IIT Delhi will be holding their annual technical festival, TRYST 2005 from February 17 to February 20 next year, where there is a robotics' competition as well. Students from various engineering colleges and high schools can take part in this technical festival. For more details visit: <http://www.iitd.ernet.in/~tryst>.