

INTRODUCTION TO ROBOTICS

ROBOTICS: An electrical, mechanical or electromechanical, programmable or non programmable multifunctional manipulator designed to move material, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks.

- ❖ The term "robot" is derived from a Czech word that means forced labor. It was coined by Karel Capek, a playwright that invented fictional robot monsters.
- ❖ Robot and Robotics technologies represented a practical application of physics, computer science, engineering and mathematics.
- ❖ Robots consist of three main components:
 1. A mechanical device that can interact with surroundings
 2. Sensors that provide feedback from environment
 3. A system to communicate between the mechanical device and sensory data
- ❖ Robots can be divided into three main categories:
 1. **Industrial Robots** - These robots are dedicated to performing repetitive manufacturing tasks that are often unsafe or unpleasant for human workers. They are designed to repeat the same process over and over without change. Modern industrial robots can easily be programmed to perform new applications.
 2. **Research / Service Robots** - These robots are designed to assist in exploring and gathering data. They are often used in space applications, surgeries, and household chores. They are designed to not only interact with the environment, but react appropriately, thus coining the term "artificial intelligence."

3. **Educational Robots** - These robots are sometimes considered toys or kits and are designed to provide an educational experience. Educational robots are used in competitions and for learning experience. They often have the ability to simulate learned behavior.

LAWS OF ROBOTICS: *Isaac Asimov* popularized the term robotics. Asimov is a visionary who envisioned in the 1930's the positron brain for controlling robots. He invented the three laws of robotics:

- ❖ **Law 1:** A robot may not harm a human through action or in action.
- ❖ **Law 2:** A robot must obey the orders given by human beings, except when such orders conflict with the First Law
- ❖ **Law 3:** A robot must protect its own existence as long as it does not conflict with the First or Second Laws

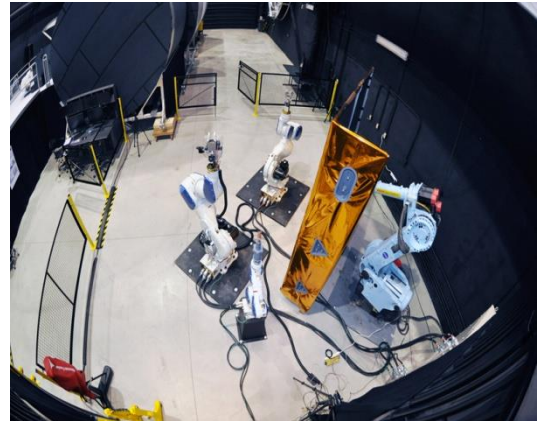
FUNCTIONS OF ROBOT: Robot is a machine that functions in place of living agent / things. Robots are especially designed for certain work functions because:-

- ❖ They never get tired.
- ❖ They can endure physical conditions that are uncomfortable or even dangerous.
- ❖ They can operate in airless conditions.
- ❖ They don't get bored by repetition.
- ❖ They cannot be distracted from the task.

EXAMPLES:



Military Service Robot



Satellite Servicing Robot



Industrial Robot