MODULE 4
AUTOMATION USING ROBOTICS

Introduction to Robotics

Key Components of Robotics:

Mechanical Design:

Sensors:

Actuators:

Control Systems:

Power Supply:

Types of a Robot

1. Industrial Robots
2. Service Robots
3. Mobile Robots
4. Humanoid Robots
5. Research Robots

Classification of Robots

Based on Application:

- **Industrial Robots:**
- **Service Robots:** Designed to assist or entertain humans, these robots can be further divided into:
  - Medical Robots: Used in surgeries, diagnostics, and patient care.
  - Domestic Robots: Perform household chores like vacuuming, mowing the lawn, or cleaning.
  - Entertainment Robots: Include robotic toys and companion robots.
- **Agricultural Robots:**
- **Space and Exploration Robots:**
- **Military and Defense Robots:**
- **Search and Rescue Robots:**
- **Educational and Research Robots:**

- **Based on Mobility:**
- Stationary Robots:
- Mobile Robots: Have the ability to move around and operate in various environments. These can be further categorized as:
  - Wheeled Robots:
  - Legged Robots:
  - Aerial Robots:
  - Underwater Robots:

Based on Control:

- Autonomous Robots:
- Teleoperated Robots:
- Semi-Autonomous Robots:

Based on Physical Attributes:

- Humanoid Robots:
- Non-Humanoid Robots:

Based on Complexity:

- Simple Robots:
- Complex Robots:

Based on Number of Axes:

- 3-Axis Robots:
- 6-Axis Robots:

Based on Use of Artificial Intelligence (AI):

- AI-Powered Robots: