

ROBOTICS



What is Robotics?

Robotics is the branch of technology that deals with designing, building, and using robots.



What is a Robot?

Robots are machines that can perform tasks automatically or with some human guidance.

It is often controlled by a computer program and can interact with its environment.



Examples of Robots?

1. Robot vacuum cleaner
2. LED Traffic light system
3. Line-following robot
4. Obstacle avoiding robot
5. Drone
6. Robotic arm
7. NAO – Humaniod robot



Examples of Robots(Cont'd)



Robot vacuum cleaner

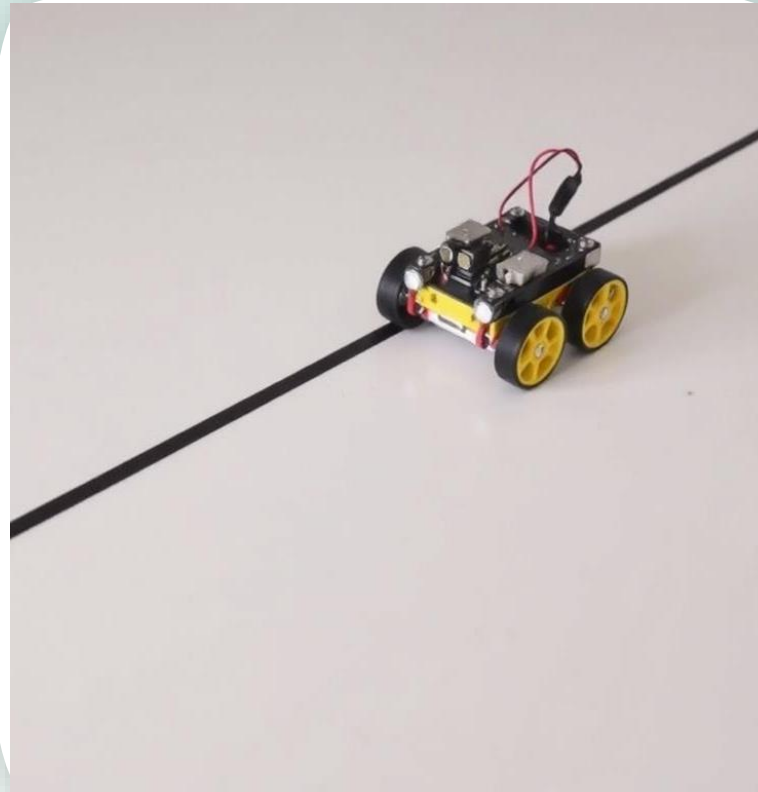
It is a small, round robot that cleans floors on their own.





A LED traffic light system

It is a bright, energy-saving lights that control traffic at intersections and keep roads safe for drivers and pedestrians.



A line-following robot

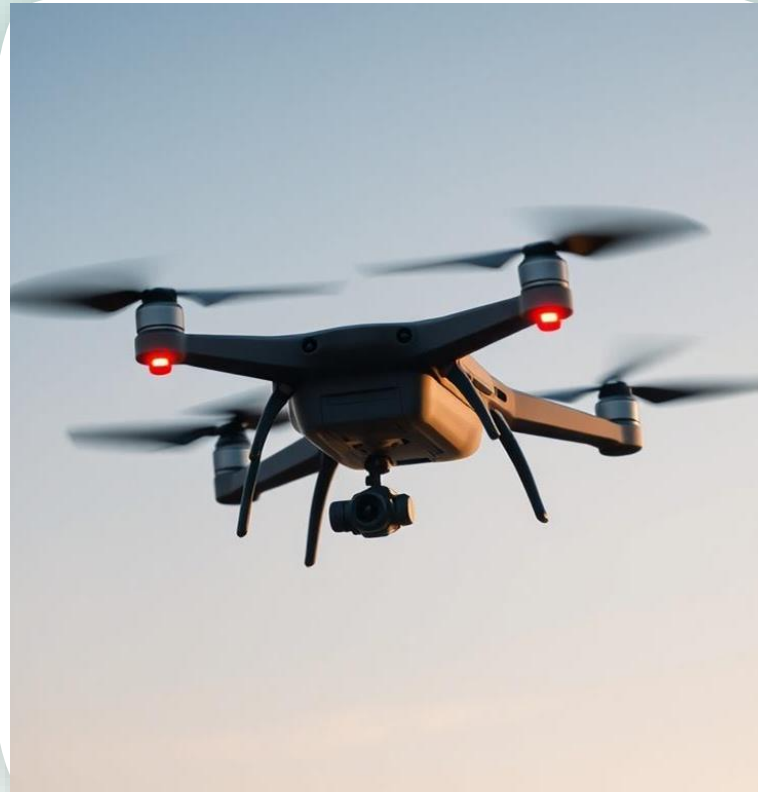
It is a small machine that moves along a path marked by a line, usually using sensors to detect and follow it.





An obstacle-avoiding robot

It is a machine that can detect and steer away from obstacles in its path to prevent collisions.



A drone

It is a flying device that can be controlled remotely or fly automatically, often used for taking photos, delivering packages, or monitoring areas.





A robotic arm

It is a machine that mimics a human arm's movements to perform tasks like picking up objects or assembling items.



NAO Robot

is a small humanoid robot designed for education and research, capable of speaking, walking, and interacting with people.



Real life Applications of Robotic Systems

1. Manufacturing

2. Healthcare

3. Military

4. Agriculture

5. Exploration

7. Education

8. Logistics

9. Entertainment

10. Research

11. Household



PROJECT 1

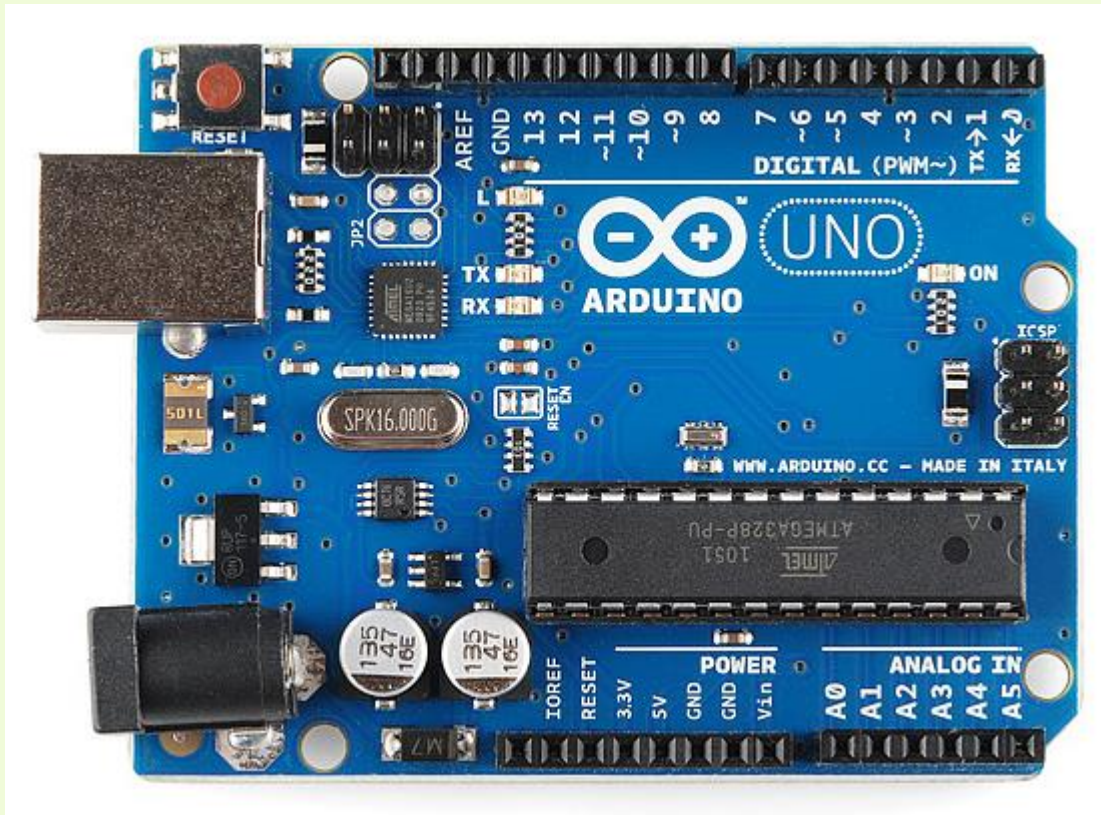
LED Traffic Light System



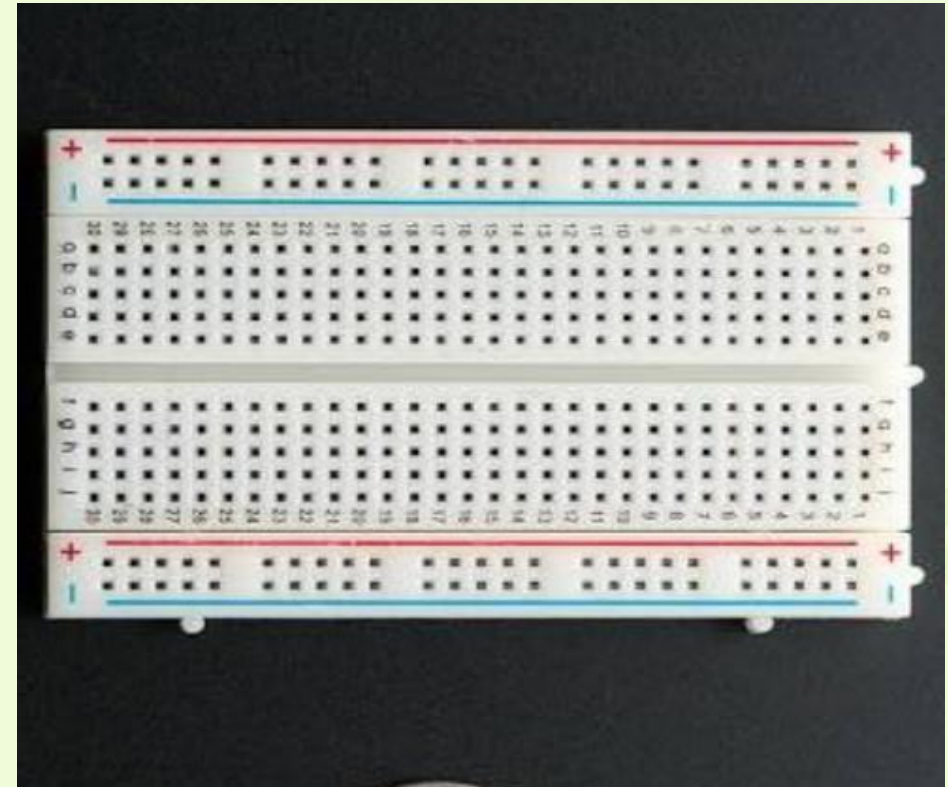
Materials required

1. Arduino Uno
2. Breadboard
3. LEDs(Red, Yellow, Green)
4. Resistors
5. Jumper wires(male-to-male)
6. USB cable
7. Buzzer + Push button



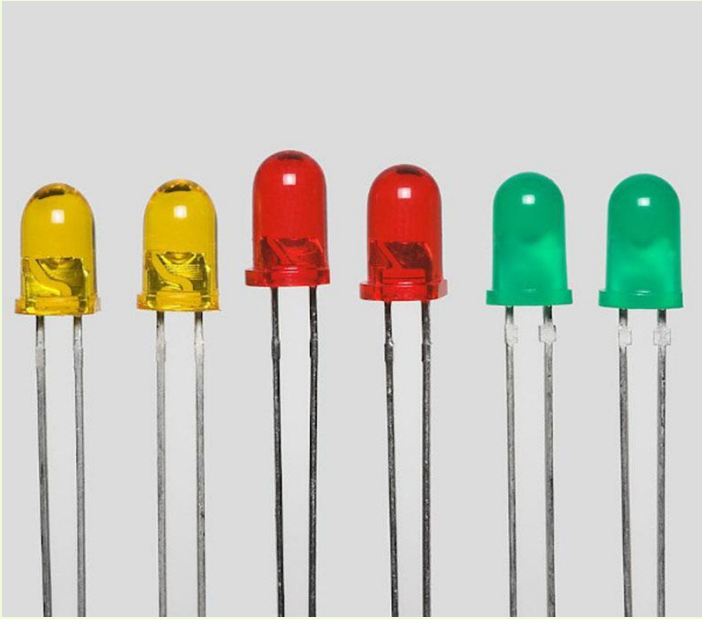


Arduino uno



Breadboard





LEDs



Resistors



Jumper wires (male-to-male)





Jumper wires (male-to-female)



Push button



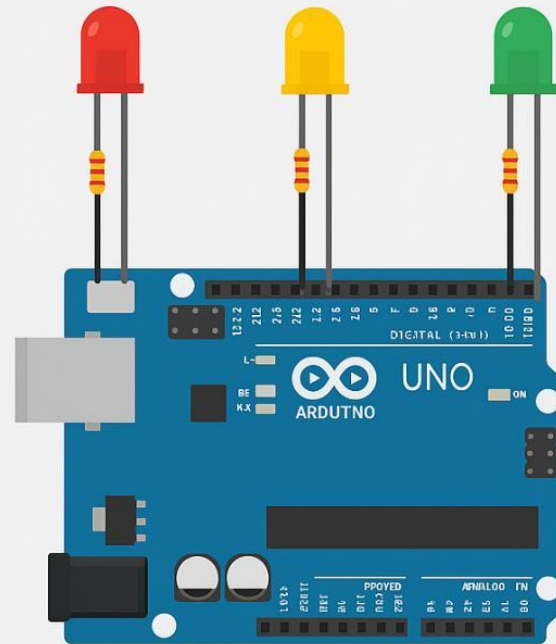
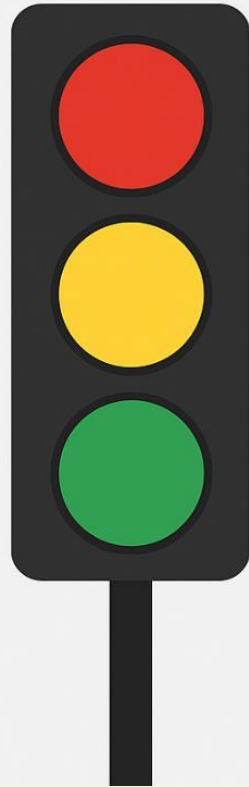
USB cable



Buzzer



LED TRAFFIC LIGHT SYSTEM



Steps to download and install the Arduino IDE on a Windows laptop

➤ Step 1: Download Arduino IDE

- i. Open your web browser and type “<https://www.arduino.cc/en/software/>”
- ii. Scroll down to the section labeled "Download the Arduino IDE."
- iii. Click on the Windows installer option (either the Windows Installer or the ZIP file, depending on your preference).



Steps(Cont'd)

➤ Step 2: Install Arduino IDE

- i. If you downloaded the installer, locate the downloaded file (usually in the Downloads folder) and double-click it to run.
- ii. If you downloaded the ZIP file, extract the contents to a folder, then navigate to that folder and find the “setup.exe” file to run.
- iii. When prompted by the installer, click "Next" to proceed.
- iv. Accept the license agreement.



Steps(Cont'd)

- v. Choose the installation location (you can use the default).
- vi. Select the additional tasks you want (usually, it's fine to leave the defaults checked).
- vii. Click "Install" to begin the installation.
- viii. Once the installation process is complete, click "Close" to exit the installer.



Steps(Cont'd)

➤ Step 3: Launch Arduino IDE

- i. You can find the Arduino IDE in your Start Menu or on your Desktop if a shortcut was created.
- ii. Click on the Arduino icon to launch the application.



Steps(Cont'd)

➤ Step 4: Install Drivers (if necessary)

- i. Connect your Arduino board to your laptop using a USB cable.
- ii. If prompted to install drivers, follow the on-screen instructions. The Arduino IDE typically includes drivers for most boards.



Steps(Cont'd)

➤ Step 5: Verify Installation

- i. In the Arduino IDE, go to “File” > “Examples”, and select any example sketch (like "Blink").
- ii. Go to “Tools” > “Board” and select your Arduino model (e.g., Arduino Uno).
- iii. Go to “Tools” > “Port” and select the COM port associated with your Arduino.
- iv. Click the upload button (right arrow icon) in the IDE to upload the sketch to your Arduino.



Steps(Cont'd)

➤ Step 6: Start Coding!

- i. You're all set! You can now start coding and working on your Arduino projects.



Resources

- Project Material document can be [found here](#)
- Lecture Slides can be [found here](#)



THANK YOU

See you in the
next class!!!

