



## 5.1.2 b

### ICT and Computing Skills

Our college organizes time to time various web design course and other informative session through which it will enable and increase awareness, propagating a culture of safe use of the internet among the students, staffs and faculties of our college. Providing the knowledge & analytical skills necessary for the safe and optimum use of digital communication technology. In order to strengthen the programme our students exhibit their talents by displaying their models which had real life application. Our teams participated in model making event and show their unique models. Following are the activities done in college campus:

1. **Web Design training:** Our college designed certificate course in web design to give some idea to the beginner and intermediate students about basic web designing. This course focuses the fundamentals of web develop and techniques. It includes basic principle of web page design, basic concept of HTML, Concept of CSS, web publishing etc.





## 2. Incubation centre activities

The college has established a Research and Entrepreneurship Hub for innovation and incubation related activities. This Incubation centre play a crucial role in college environment by serving as a catalyst for transforming theoretical knowledge into tangible outcomes, offering a myriad of benefits that contribute to both individual and collective growth.

This centre empowers students to go beyond traditional academic boundaries. It provides a fertile ground for innovation, nurture entrepreneurial ambitions, promote collaboration, and bridge the gap between academia and industry. Ultimately, these activities contribute to the holistic development of students, preparing them not only for successful careers but also for making meaningful contributions to society through their innovative ideas and endeavours. Following are some activities conducted in the Incubation Centre from **15<sup>th</sup> to 30<sup>th</sup> May, 2023** for the Creation and transfer of Knowledge



### i. Line Follower Robot

A Line Follower Robot is a popular project in robotics that employs Arduino for its control and functionality. The primary goal of a Line Follower Robot is to autonomously navigate along a predefined path, typically a contrasting-coloured line on a surface. The robot is equipped with sensors to detect this line and make course corrections accordingly to stay on track. Components: Arduino Board: Acts as the control unit for processing sensor data and controlling the watering system.

IR Sensor: Sensor which detect object

DC Motor: Robotics Movement.

Power Supply: Powers the system components.

### Student Demonstrating Robotic Movement



### ii. Home Automation to control Light & Fan

This project showcases the fusion of Arduino's control capabilities with smartphone technology, demonstrating how a custom-designed Android app can enable remote control of household devices. It exemplifies the potential for home automation systems, offering convenience, energy efficiency, and user-friendly control interfaces. This Project is implemented in the Physics lab.





Components: Arduino Board: Acts as the control unit for processing sensor data and controlling the watering system.

Relay: Convert 5V to 220V

Bluetooth: Communication Protocol.

Power Supply: Powers the system components.

### Demonstration on Automated Power Supply System



### iii. Sandwatch

Sandwatch, a captivating robotics project built on Arduino, replicates the elegant dynamics of an hourglass using LEDs. This innovative creation mimics the visual spectacle of sand trickling through an hourglass, creating a mesmerizing display that showcases the passage of time. The project utilizes an Arduino microcontroller as the brain of the operation, controlling the LED patterns to simulate the filling and emptying of the hourglass. A series of LEDs are arranged in a manner that resembles the shape of an hourglass. By programming the Arduino with the appropriate algorithms, the LEDs light up sequentially or in patterns that simulate the movement of sand particles from the top to the bottom of the hourglass.

Components:



Arduino Board: Acts as the control unit for processing sensor data and controlling the watering system.

LED: Led to glow

Power Supply: Powers the system components.

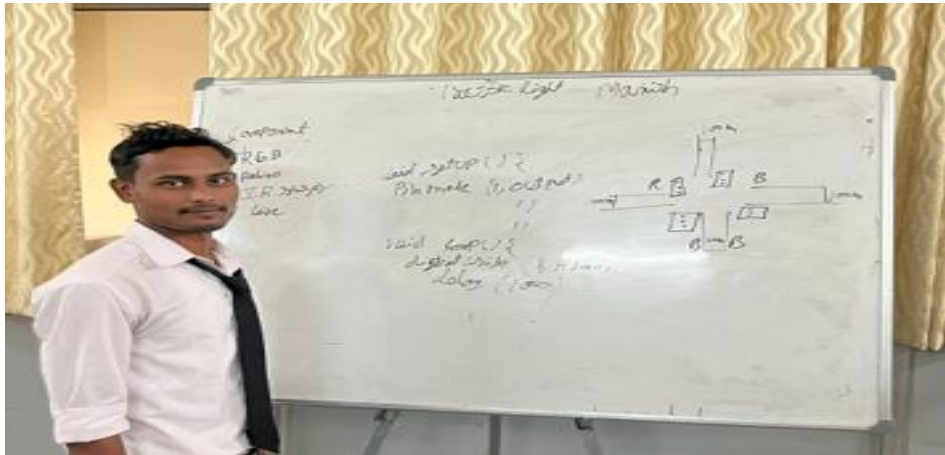
### Demonstration on Sandwatch Circuit



#### iv. Traffic Light Management System

A Traffic Light Management System using Arduino and RGB (Red, Green, Blue) LEDs is a project designed to simulate and control traffic lights for educational or small-scale applications. The main aim of this system is to replicate and manage the functionality of traffic lights using Arduino and RGB LEDs, allowing for a programmable and customizable traffic signal simulation. Components Used: Arduino Board: Central control unit for managing the traffic light sequence. RGB LEDs: Represent the red, green, and yellow lights in traffic signals. Resistors: Required for limiting the current flowing through the LEDs. Breadboard/Jumper Wires: Used for the circuit connections. Power Supply: Provides power to the system.

### Demonstration on Traffic Light Management System



#### v. Edge Follower

The goal is to develop a robot that uses an ultrasonic sensor to detect the proximity of an edge or an obstacle and navigate along it autonomously. Components: Arduino Board: Acts as the brain of the robot, processing sensor data and controlling motors. Ultrasonic Sensor (HC-SR04): Detects distance by emitting ultrasonic waves and measuring their reflection. Motor Driver: Interfaces the Arduino with the robot's motors for movement control. Wheels and Motors: To provide movement to the robot. Chassis: Physical structure or base of the robot to hold the components. Power Supply: Batteries or another power source for the robot's operation.

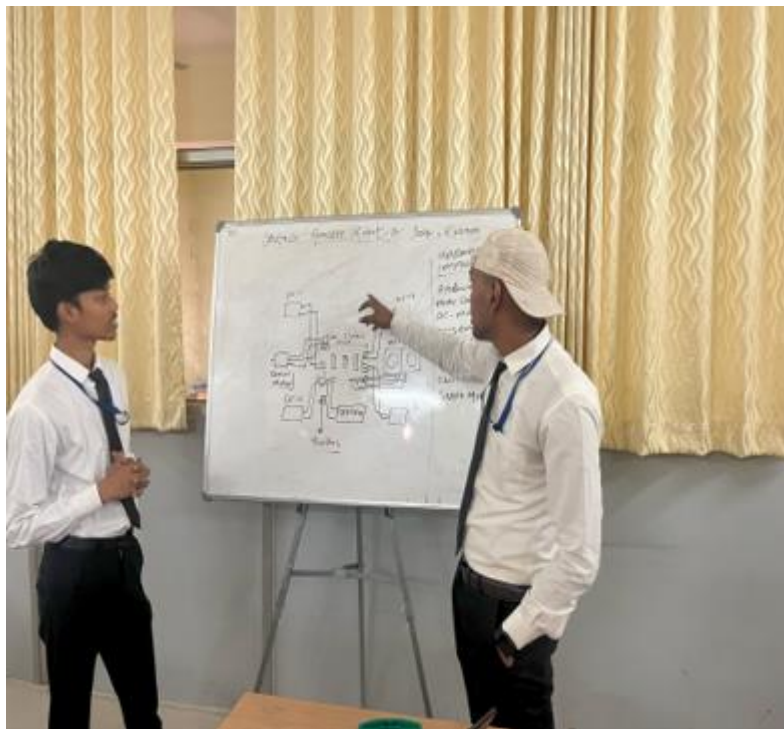
### Demonstration on Edge Follower



vi. **Obstacle Avoider**

The goal is to develop a robot that uses IR sensors to detect obstacles and maneuver itself to avoid collisions while moving in a predefined direction. Components: Arduino Board: Serves as the control unit for processing sensor data and controlling the robot's movement. IR Sensors (Infrared Proximity Sensors): Detects obstacles in the robot's path by emitting and receiving infrared light. Motor Driver: Interfaces the Arduino with the robot's motors for movement control. Wheels and Motors: To provide movement to the robot. Chassis: Physical structure or base of the robot to hold the components. Power Supply: Batteries or another power source for the robot's operation.

**Demonstration on Obstacle Avoider**



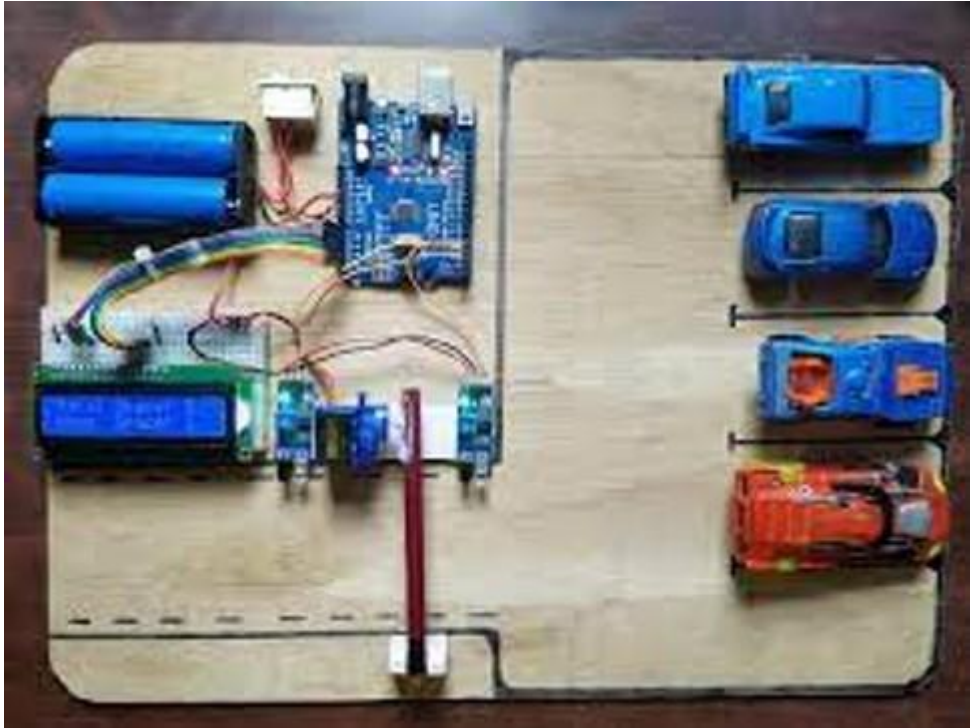
vii. **Car Parking Management System**

The goal is to develop a robot that uses IR sensors to detect obstacles and maneuver itself to avoid collisions while moving in a predefined direction. Components: Arduino Board: Serves as the control unit for processing sensor data and controlling the robot's movement. IR Sensors (Infrared Proximity Sensors): Detects obstacles in the robot's path by emitting and receiving infrared light. Motor Driver: Interfaces the Arduino with the robot's motors for movement



control. Wheels and Motors: To provide movement to the robot. Chassis: Physical structure or base of the robot to hold the components. Power Supply: Batteries or another power source for the robot's operation.

### Demonstration on Car parking Management System



#### viii. Smart Trash Can

A Smart Trash Can using an ultrasonic sensor and Arduino is designed to automate the process of opening the trash can lid when someone approaches it, facilitating hands-free disposal. The main goal is to create a trash can that automatically opens its lid when a person approaches it, using an ultrasonic sensor to detect proximity. Components: Arduino Board: Acts as the control unit for processing sensor data and controlling the trash can lid. Ultrasonic Sensor (HC-SR04): Detects the presence of an object or person in proximity to the trash can. Servo Motor: Controls the opening and closing of the trash can lid. Trash Can Lid Mechanism: The physical lid that is controlled by the servo motor. Power Supply: Powers the system components.



### Demonstration on Smart Trash Can



#### ix. Automatic Water Plant System

An Automatic Watering System for plants using a moisture sensor and Arduino is designed to monitor the moisture level in the soil and automatically water the plants when needed. The main goal is to create a system that maintains optimal soil moisture levels for plants by automatically watering them when the soil becomes too dry. Components: Arduino Board: Acts as the control unit for processing sensor data and controlling the watering system. Moisture Sensor: Measures the moisture content in the soil. Water Pump or Solenoid Valve: Dispenses water to the plants. Water Reservoir/Tank: Stores water for the watering system. Power Supply: Powers the system components.



### Demonstration on Automatic Water Plant System



#### i. E-commerce System User Design

Designing an effective and unique E-commerce platform involves considering various aspects to ensure user satisfaction, functionality, and differentiation from existing portals. Below pointers have been covered in the designing of Portal User Personas Intuitive Navigation Responsive Design Distinct Brand Identity Value Proposition Personalized Content Analytics and Optimization.



## Student Demonstrating the E-commerce System User Design



### i. Loyalty Management System Design

Loyalty Management System (LMS) involves creating a platform that fosters customer engagement, encourages repeat purchases, and rewards loyal customers. Understanding Customer Behavior Segmentation User-Friendly Design Reward Structure Personalized Offers



### Student Demonstrating on Loyalty Management System Design



#### Billing 360 System User Design

Designing a Billing 360 System involves creating a comprehensive software solution that manages and automates billing processes across different aspects of a business. It typically includes functionalities for invoicing, payment processing, customer management, inventory tracking, and reporting. Invoicing and Billing Customer Management Inventory and Product Management Payment Processing





**i. Student 360 System User Design**

Designing a student 360 System using Python involves creating a comprehensive software platform that manages student-related information, academic records, communication, and administrative tasks for educational institutions. Student Information Management Course and Curriculum Management Attendance and Performance Tracking.

**Student Demonstrating 360 System User Design**



**ii. Automatic Water TaP**

Automated water tap using a motion sensor and Arduino involves designing a system that activates a water tap when motion is detected within its proximity. Components: Arduino Board: Controls the system and processes data. Motion Sensor (Passive Infrared Sensor - PIR): Detects motion. Solenoid Valve or Water Pump: Controls the flow of water. Water Tap/Outlet: Dispenses water when activated. Power Supply: Powers the system components.



### iii. Gas Detection in Kitchen

Flame Sensor and Arduino for gas detection in the kitchen involves creating a system that detects the presence of flames, which could indicate a gas leak or potential hazard in the kitchen environment. The main goal is to use a flame sensor to detect the presence of flames (which might indicate a gas leak or a fire hazard) and trigger an alert or an action using Arduino.

Components:

- Arduino Board: Acts as the control unit for processing sensor data and triggering alerts.
- Flame Sensor: Detects the presence of flames by responding to infrared light emitted by fire.
- Buzzer/Alarm: Alerts users in case of flame detection.
- Power Supply: Supplies power to the system components.

## Gas Detection in Kitchen

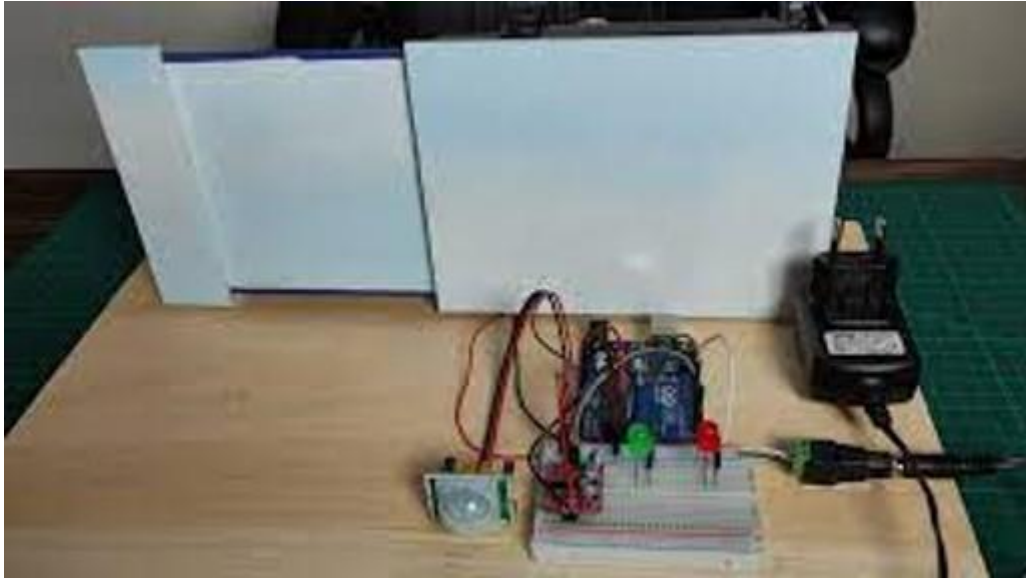


### iv. Automatic gate Opening System

Automatic Gate Opening System using RFID and Arduino involves building a system that automatically opens a gate when it detects an authorized RFID tag in close proximity. The primary goal is to design a gate system that opens automatically upon detecting an authorized RFID tag, providing convenience and security for entry. Components: Arduino Board: Acts as the control unit for processing RFID data and controlling the gate mechanism. RFID Reader: Detects and reads RFID tags/cards for identification. RFID Tags/Cards: Authorized tags/cards assigned to users for gate access. Gate Mechanism: Motor or actuator to open and close the gate. Power Supply: Powers the system components.



## Automatic Gate Opening System



### i. Clapping Controlled Home Automation for Blind

clapping-controlled home automation system for the visually impaired using a sound sensor and relay involves designing a setup where specific clapping patterns trigger various home automation tasks, providing accessibility and convenience. The primary goal is to design a system that enables the visually impaired to control home appliances or perform tasks through distinct clapping patterns detected by a sound sensor. Components: Arduino Board: Serves as the control unit for processing sound sensor data and controlling relays. Sound Sensor (Microphone Module): Detects sound levels and patterns. Relay Modules: Controls the home appliances or devices. Home Appliances/Devices: Such as lights, fans, or other controllable electronics. Power Supply: Powers the system components.



## Clapping Controlled Home Automation for Blind



### i. Blind Stick Automation

Blind Stick Automation system using ultrasonic sensors and Arduino involves creating a device that assists visually impaired individuals by detecting obstacles and providing feedback through vibrations or alerts. The main goal is to design a smart blind stick that uses ultrasonic sensors to detect obstacles and provides haptic or auditory feedback to aid navigation for visually impaired individuals. Components: Arduino Board: Acts as the control unit for processing sensor data and generating feedback. Ultrasonic Sensors (HC-SR04): Detects obstacles by emitting and receiving ultrasonic waves. Vibration Motor/Buzzer: Provides haptic or auditory alerts to the user. Battery/Power Supply: Powers the system components. Enclosure/Handle: Physical housing for the device.

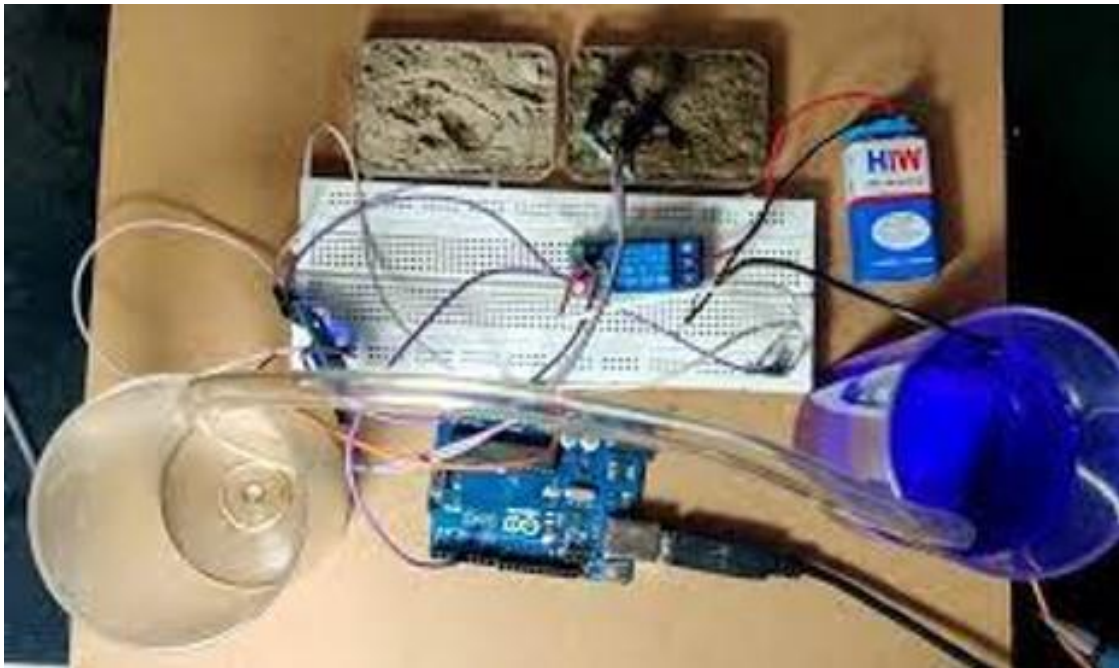
### Demonstration of Blind Stick Automation



**i. Drip Irrigation System**

Building a Drip Irrigation System using a moisture sensor and Arduino involves creating an automated watering system that supplies water to plants based on their soil moisture levels. The main goal is to design an automated irrigation system that waters plants only when the soil moisture falls below a certain level, ensuring efficient water usage and optimal plant health. Components: Arduino Board: Controls the irrigation system based on sensor readings. Moisture Sensor: Measures soil moisture levels. Water Pump or Solenoid Valve: Dispenses water to plants. Water Reservoir/Tank: Holds water for irrigation. Power Supply: Powers the system components.

**Demonstration of Drip Irrigation System**

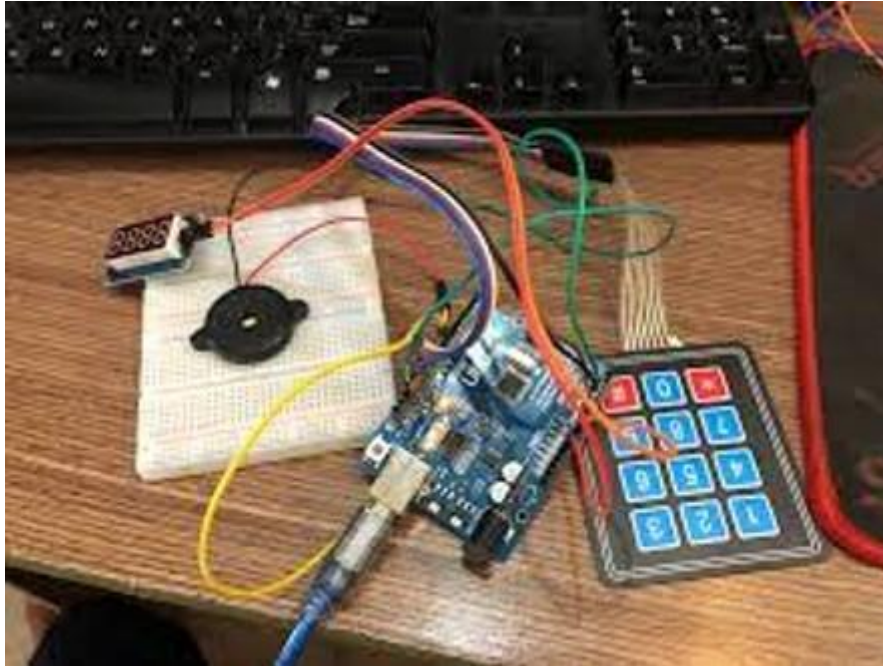


**ii. Keypad Controlled led System**

Keypad Controlled LED System using Arduino, a keypad, a relay module, and bulbs involves designing a system where input from the keypad triggers specific actions, such as turning on/off LEDs or bulbs connected through a relay. The goal is to create a system where the input entered through a keypad controls the operation of LEDs or bulbs through a relay using an Arduino as the central controller. Components: Arduino Board: Controls the system and processes keypad input. Keypad: Receives user input to trigger actions. Relay Module: Controls the on/off

function of the bulbs or LEDs. LEDs/Bulbs: Connected to the relay for on/off control. Power Supply: Powers the system components.

### Demonstration of Keypad Controlled led System

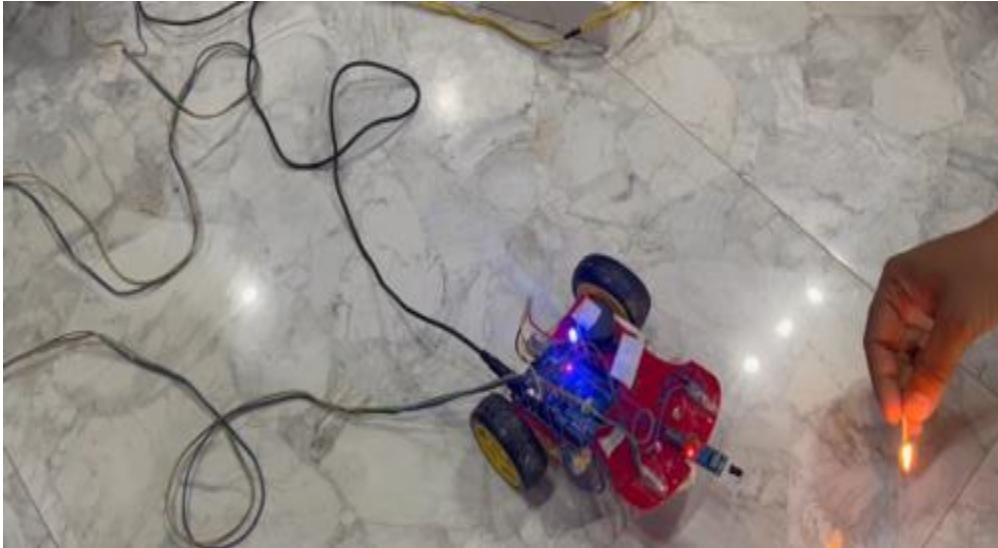


#### i. Fire Fighting Robot

Fire-Fighting Robot using a flame sensor and a robot with DC motors involves designing a robot that can detect flames and navigate towards them to aid in fire extinguishing or alerting. Arduino Board: Controls the robot's movements and processes sensor data. Flame Sensor: Detects the presence of flames. DC Motors: Drive the robot's movement. Chassis: Physical structure to hold the components and provide mobility. Water Pump/Sprinkler (Optional): Dispenses water for firefighting.



### Demonstration on Fire Fighting Robot



#### i. Heartbeat Monitoring System

Heartbeat Monitoring System using Arduino and a heartbeat sensor involves developing a system that measures and displays a person's heartbeat in real-time. Components: Arduino Board: Processes data from the heartbeat sensor and controls the system. Heartbeat Sensor: Captures the heart rate data. Display Module: Displays the heart rate (e.g., an LCD display). Power Supply: Powers the system components.

#### Demonstration on Heartbeat Monitoring System

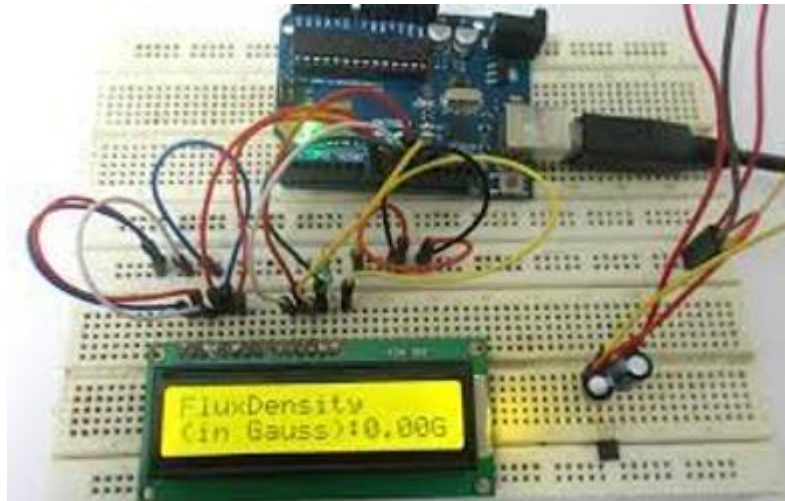




### i. Linear Magnetic System

A linear magnetic system using an Arduino and a linear magnetic sensor can be designed to measure linear motion or displacement. Components: Arduino Board: Controls the system and processes data. Linear Magnetic Sensor: Detects changes in magnetic fields to measure linear motion. Linear Actuator (Optional): Device responsible for creating linear motion (e.g., a linear motor or solenoid). Power Supply: Powers the system components.

#### Demonstration on Linear Magnetic System



### i. DPDT Switch Robot

A DPDT (Double Pole Double Throw) switch used in conjunction with an Arduino in a robot can serve various purposes, primarily for controlling different functionalities or movements. Components: Arduino Board: Acts as the control unit for the robot. DPDT Switch: A switch that can control two circuits simultaneously, offering various configurations. Robot Chassis: Physical structure housing the robot's components. Motor Drivers/Motors: Control the movement of the robot. Power Supply: Powers the Arduino and motors.



### Demonstration on DPDT Switch Robot





**An Innovative Boot Camp**  
On  
Revolutionizing Life through  
Internet of Things (IoT),  
Machine Learning and  
Artificial Intelligence (AI) Automation  
for  
**Students of B.Sc., M.Sc., B.Sc. (IT), BCA and MCA**

Organized by  
Training and Placement Cell,  
with IQAC,  
College of Commerce Arts and Science, Patna  
in collaboration with

**RevivingINDIA**  
Transforming Lives Digitally

All Teachers and students are cordially invited  
All student participants will get e-certificate

📅 29<sup>th</sup> August, 2023 ● 11.00 A.M.  
📍 Vanijya Sabhagar, COCAS, Patna

Our College has an MOU with Reviving India to enhance students with Information and Communication technical support.



## कॉलेज ऑफ कॉमर्स में बूट कैंप आयोजित

पटना। कॉलेज ऑफ कॉमर्स आर्ट्स एंड साइंस पटना में मंगलवार को ट्रेनिंग एंड प्लेसमेंट सेल, आईक्यूएसी और रिवाइविंग इंडिया के संयुक्त तत्वावधान में इनोवेटिव बूट कैंप का आयोजन किया गया। कार्यक्रम का आयोजन रिवाइविंग इंडिया के साथ एमओयू के तहत किया गया।

## कॉलेज ऑफ कॉमर्स में बूट कैंप आयोजित



पटना 29 अक्टूबर (प्रेस रिलीज) - रिवाइविंग इंडिया फ्लैगशिप सेल, IOAC का 'Reviving India' के श्रेष्ठ कर्तव्य प्रारंभिक प्रोग्राम को कॉलेज ऑफ कॉमर्स आर्ट्स एंड साइंस, पटना में एक अंतर्राष्ट्रीय बूट कैंप का आयोजन किया गया। प्रोग्राम रोज-ए-रोज के माध्यम से 11 दिनों के लिए चलाया जाएगा। भागीदारों के तहत रिवाइविंग इंडिया के अंतर्गत एक साल तक तकनीकी शिक्षा प्रदान करेगा। बूट कैंप में BCA (ITB, Sc + B, Sc, M, Sc) और MCA के छात्रों को शामिल किया जाएगा।

## कॉलेज ऑफ कॉमर्स के छात्रों को तकनीकी शिक्षा मिलेगी

पटना। कॉलेज ऑफ कॉमर्स में मंगलवार को इनोवेटिव बूट कैंप का आयोजन किया गया। कार्यक्रम का आयोजन रिवाइविंग इंडिया के साथ हाल में हुए एमओयू के तहत किया गया। रिवाइविंग इंडिया के अधिकारी एक वर्ष तक कॉलेज के छात्रों को तकनीकी शिक्षा देंगे। बूट कैंप में बीएससीएमएससी, बीएससी

## कॉलेज ऑफ कॉमर्स में बूट कैंप

पटना : कॉलेज ऑफ कॉमर्स आर्ट्स एंड साइंस पटना में ट्रेनिंग एंड प्लेसमेंट सेल, आईक्यूएसी और रिवाइविंग इंडिया ने मंगलवार को इनोवेटिव बूट कैंप का आयोजन किया। रिवाइविंग इंडिया एक वर्ष तक महाविद्यालय के छात्रों को तकनीकी शिक्षा प्रदान करेगा। कैंप में





# COLLEGE OF COMMERCE, ARTS & SCIENCE, PATNA

A constituent unit of Patliputra University, Patna

स्थापित 1949

NAAC Re-Accredited

With Grade - A | CGPA of 3.10/4



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Long 85.161978°  
29/08/23 11:28 AM GMT +05:30

  
Principal  
College of Commerce, Arts & Science  
Patna- 800020





*[Signature]*  
Principal  
College of Commerce, Arts & Science  
Patna- 800020



### Internet Safety Programme

NSS Volunteers participated in a workshop on **Internet Safety** organized in the college on 2.11.23. The resource person of the workshop was Mrs. Mitakshi from Population Foundation India. In this interactive workshop volunteers learnt about cyber bullying, cyber fraud, and internet safety. Resource person has clearly explained that college students are particularly vulnerable to cyberattacks. In this guide, she illustrates how to stay safe and secure in an evolving digital landscape of cybersecurity threats.

### Distribution of Certificate on the Internet Safety Programme





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# College of Commerce, Arts & Science

Kankarbagh, Patna - 800020  
(A Constituent unit of Patliputra University, Patna)  
NAAC RE-ACCREDITED 'A' Grade, with CGPA 3.10

### OFFICE OF THE PRINCIPAL

Ref.: .....

Date: 16/08/2019

### NOTICE

All the students are informed that, our college is conducting a career guidance program on **Impact of Artificial Intelligence and Gaming in our Daily Life** on 19.08.2019.

Venue: Vanijya Sabhagar.

Resource person: Orion Sandeep, Dubai

Principal

Principal  
College of Commerce, Arts & Science  
Patna-800020





Lecture on Impact of Artificial Intelligence and Gaming in our Daily Lives





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# College of Commerce, Arts & Science

Kankarbagh, Patna - 800020  
(A Constituent unit of Patliputra University, Patna)  
NAAC RE-ACCREDITED 'A' Grade, with CGPA 3.10

## OFFICE OF THE PRINCIPAL

Ref. : .....

Date: 20/09/2019

### NOTICE

All the students are hereby informed that our college is conducting a career guidance on "Electronic Banking Awareness cum Training Programme " on 24.09.2019 at 11:00 AM.

Venue: Vanijya Sabhagar.

Resource person: Mr. Dubey from RBI, Regional Branch, Patna

Principal

Principal  
College of Commerce, Arts & Science  
Patna- 800020