



PG DIPLOMA IN

ARTIFICIAL INTELLIGENCE FOR EMBEDDED ROBOTICS

A part of robotics involves artificial intelligence when you choose to define a robot, where robotics involves designing, building and programming physical robots which are able to interact with the physical world.



**AMBIT
AUTOMATION**



Our Certifications



www.tuvsud.com

TÜV SÜD provide effective global training programmes for individuals and whole organisations to support you in becoming an expert for your industry: from work safety, management systems and technical skills to high-level executive programmes.



www.nabcb.qci.org.in

NABCB undertakes assessment of Certification and Inspection Bodies applying for accreditation as per the Board's criteria inline with international standards and guidelines. The Board offers accreditation to the Certification bodies and Inspection Bodies.



www.bssve.in

Started at the instance of Planning Commision, Govermentt of India with the object of enabling individual Citizens to contribute in the form of an organized cooperative effort, to the implementation of the National Development Plan.



www.msme.gov.in

MSMEs not only play crucial role in providing large employment opportunities. MSMEs are complementary to large industries as ancillary units and this sector contributes enormously to the socio-economic development of the country.



www.kase.in

With the objective of skilling the young workforce of Kerala and elevating their skills to global standards for employment in India and abroad, the Government of Kerala has set up Kerala Academy for Skills Excellence (KASE).



www.stedcouncil.com

STED COUNCIL is an esteemed organisation stood for a spectacular development for providing 400+ job oriented courses with standardized syllabus approved by STED COUNCIL authority for providing quality education and training all over the country.

Embedded C X

Introduction To Number System
Low Level And High-Level Language
C Tokens
Data Types
Input And Output Functions In C
Looping Statements
Decision Making Statements
Introduction To Number System
Low Level And High-Level Language
C Tokens



Microcontroller Programming and Interfacing X

Include PIC 16F877A, ATMEGA32, ARM7 LPC2138 and Arduino
Introduction to Microcontroller
Basics for Programming
Port Blinking / Port Controlling
Interfacing External Devices – LED, Push button, LCD, Keypad & Motor
Peripherals – ADC, UART, Timer, PWM, External interrupt
Project
Advanced Protocols- I2C, SPI

Python and Raspberry Pi X

Python Programming Language
Basic Syntax
Variable Types
Basic Operators
Decision Making
Loops, Strings, List, Tuple
Numbers, Functions, Dictionary
Modules, Exceptions, File I/O
Classes and Objects
Regular Expressions

Standard Libraries
exercise Projects
Introduction to Raspberry Pi
hardware Setup
installing Raspberry Pi OS
LED Blinking Using GPIO
Push Button Input Using GPIO
Playing Audio





Wireless Sensors & Devices

Sensors

Gas Sensor
Temperature Sensor
Humidity Sensor
Pressure Sensor
PIR Sensor
Accelerometer
Ultrasonic Sensor

Devices

GPS
GSM
ZigBee
Bluetooth
WiFi
RFID

Internet of Things

Introduction to Internet of Things

Arduino - Setting Up IDE, Digital Output, Digital Input, Analog Input, PWM, Serial Communication, Installing Libraries

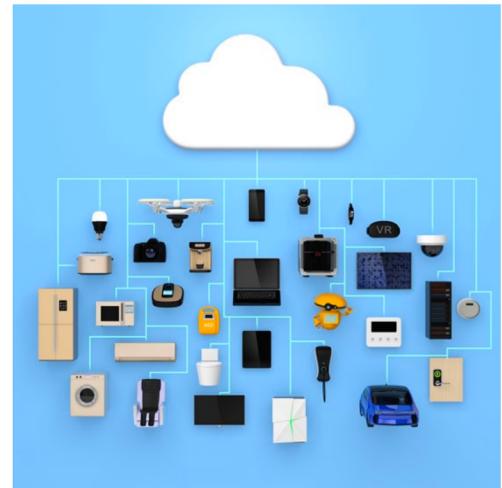
Sensing the Things in IoT - Interfacing Sensors with Arduino

Wireless Technologies- GSM, GPS, ZigBee, RFID, Bluetooth, LoRa, Wi-Fi

Introduction to IOT Protocols - HTTP, MQTT

IoT Using Cloud platforms - Thingspeak

Project Using NodeMCU



Real-time Operating Systems

Introduction to RTOS

Introduction to FreeRTOS

Porting FreeRTOS kernel on LPC2148 ARM based microcontroller

Integrating peripheral drivers with FreeRTOS

Task Creation

Mutex

Binary Semaphore

Counting Semaphore

Queue

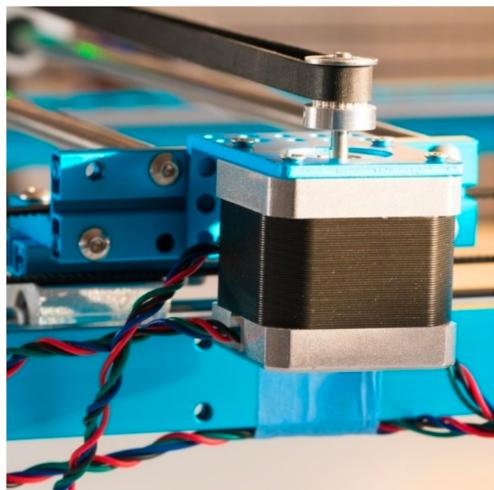
Interrupts

Demo project

🔍 Arduino

Embedded systems and Robotics
Arduino Nano hardware basics
Installing Arduino IDE and Driver
Digital Write - Controlling DC load
LED
Delay Functions for Precise Timing
Digital Read for Taking Input
Serial communication - Print message on the serial monitor
Serial communication - Read serial message and control DC load
Digital read serial - Print status of digital input to Serial monitor

X



🔍 Interfacing Sensors & Actuators

Sensors

Ultrasonic sensors
IR sensors
Gas sensors

Actuators

LED
DC Motor
Servo motor

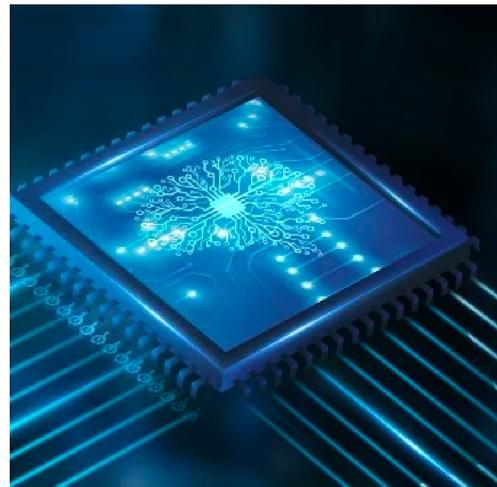
Wireless Technologies

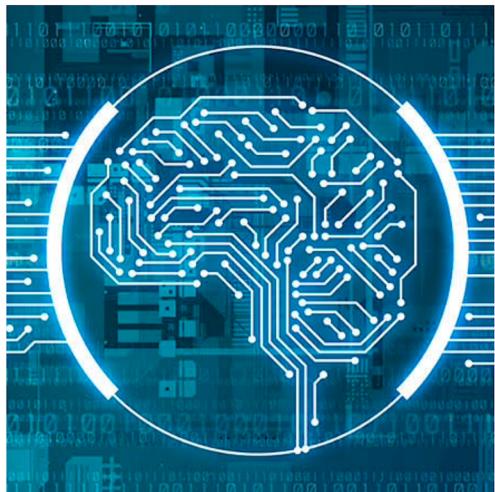
Bluetooth
ZigBee
IR sensor

🔍 Machine Learning

Machine Learning Concept
Learning Associations
Classification
Probability & Statistics In ML
Decision Trees- Tree Construction
Data Preparation
Model And Model Building
Python For Machine Learning
Supervised Learning Techniques
Advanced Classification Techniques

X





🔍 Artificial Intelligence

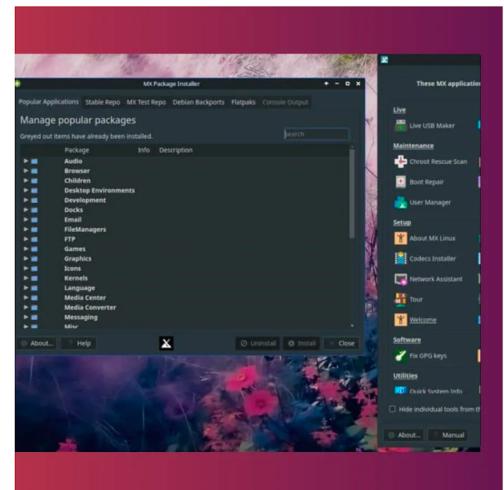
Artificial Intelligence Overview
Importance Of Artificial Intelligence
Knowledge Representation
Neural Networks
Training Feed Forward Network By Back Propagation.
Deep Learning: Concepts And Applications
Reinforcement Learning
NLP And Text Analytics

Conversational Systems
Recommender Systems
Evolutionary Computing Methods for Classification & Clustering
Generative Adversarial Networks

🔍 Basic Learning of Linux System

Introduction To Linux System
Linux Features
Multi User Operation
Linux Basic Concepts & Installation
The Linux Environment
Shell Variables
File System Management
The Linux Virtual File System
File Attributes
User Management

Linux on Embedded System
Shell Scripting
Shell Initialization Files
General Scripting



The final goal of artificial intelligence (AI)—that a machine can have a type of general intelligence similar to a human's—is one of the most ambitious ever proposed by science.

Artificial intelligence is shaping the future of humanity across nearly every industry. It is already the main driver of emerging technologies like big data, robotics and IoT, and it will continue to act as a technological innovator for the foreseeable future.



Embedded systems are at the root of the capabilities of the robot. *Embedded Robotics Engineers* program them to tell the robot how to behave in accordance with certain inputs that are based on how the robot gains information such as the type of sensor.

What if robots are able to understand the world around them? *Machine Learning & AI* help a robot to analyze its surroundings and help guide its movement, which enables the robot to avoid obstacles.



EMBEDDED SYSTEM AND ROBOTICS

6 MONTHS

EMBEDDED SYSTEM AND ARTIFICIAL INTELLIGENCE

6 MONTHS

ARTIFICIAL INTELLIGENCE FOR EMBEDDED ROBOTICS

8 MONTHS

 AMBIT AUTOMATION

