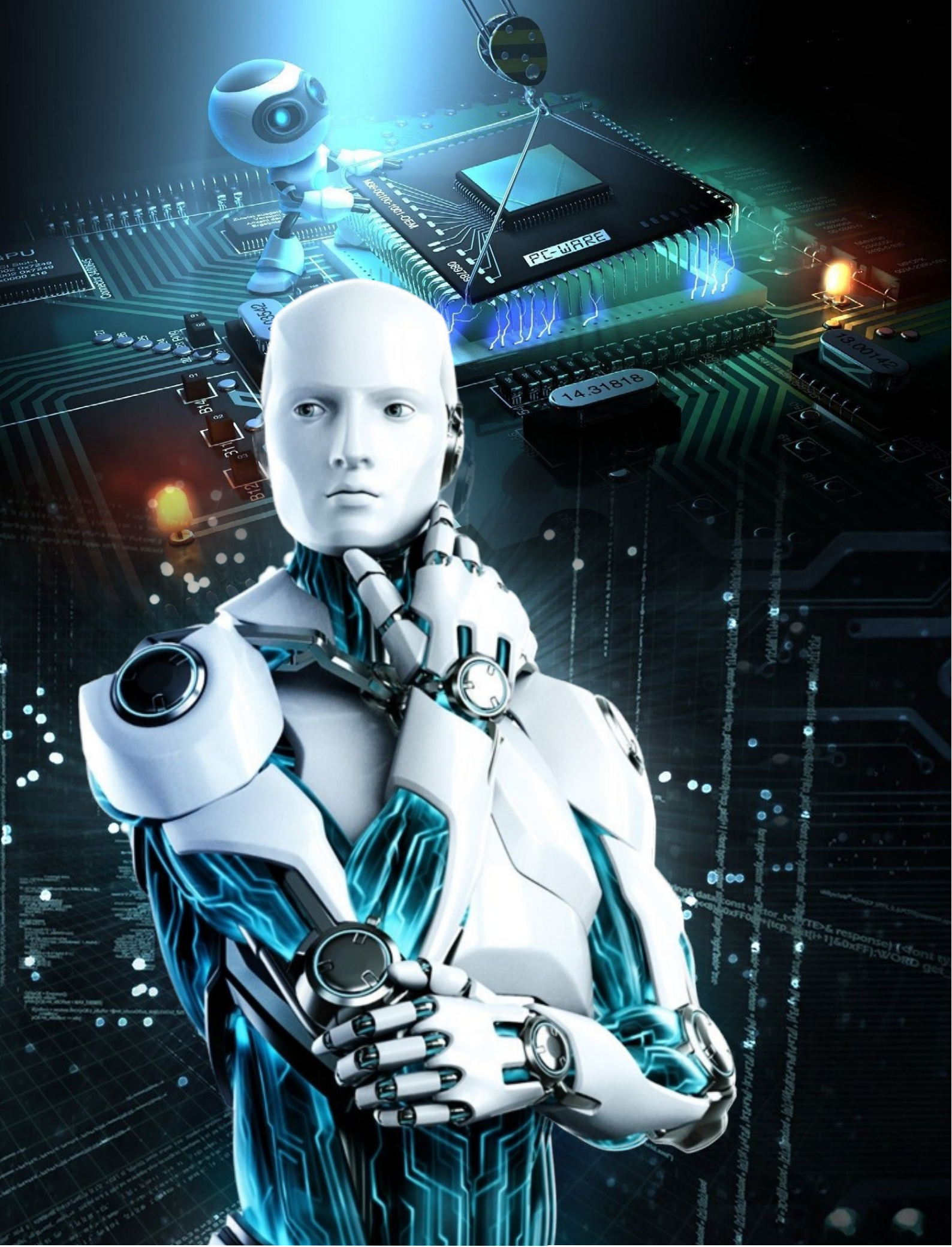


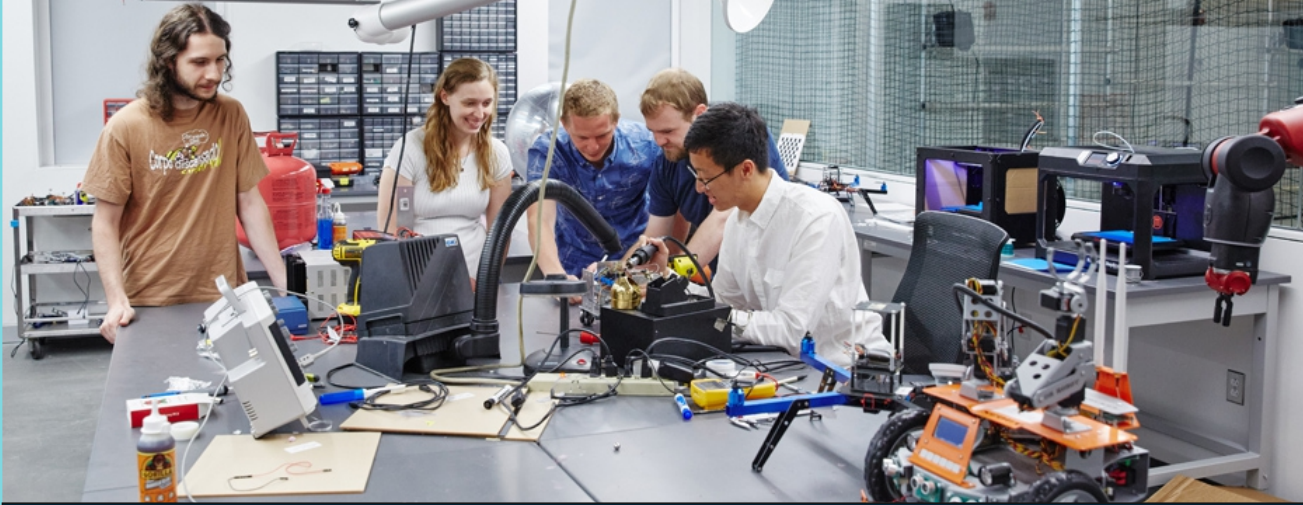
LOOKING FOR A BRIGHT CAREER IN EMBEDDED SYSTEMS ?



EMBEDDED SYSTEMS & ROBOTICS





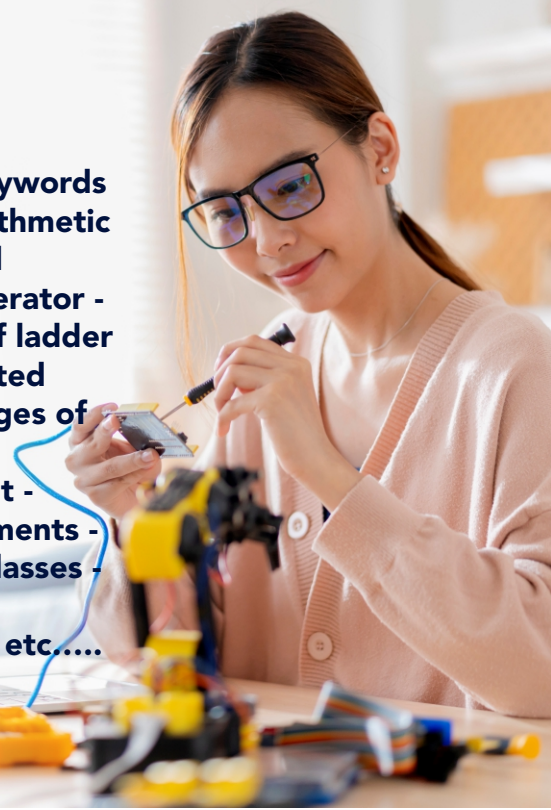


INTRODUCTION TO EMBEDDED SYSTEM

Embedded System concepts and definitions - need for embedded system - microcontrollers and microprocessor - introduction to basic electronics - resistors - capacitors - diodes - zener diode - LED - inductors - transistor - MOSFET - triac - diac - SCR - Electro mechanical devices - relay - SSR - transformer - optocouplers - speakers - contactors - introduction to digital electronics - introduction to basic integrated circuits - 555 - timer ic - 7400 - 7402 - 7404 - 7432 - 7486 - LM324 - 4511 - 74HC595 - LM7805,33,09

C PROGRAMMING

History of C - why C in embedded system - C character set - keywords - identifiers - data types - constants - input and output in C - arithmetic operators - assignment operators - relational operators - logical operators - conditional operators - comma operator - sizeof operator - bitwise operator - control statements - if else - nested if - else if ladder - switch case - loops - while loop - for loop - do while loop - nested loops - break - continue - goto statements - functions - advantages of functions - library functions - user defined functions - function definition - function call - function declaration - return statement - function argument - types of functions - order of function arguments - main function - local and global variables - recursion - storage classes - memory during program execution - code - data- heap - stack - functions with variable number of arguments - pattern printing etc.....



MICROCONTROLLERS

PIC16F877A

Introduction to PIC microcontroller - introduction to MPLAB IDE and PROTEUS software - GPIO - input/output configurations - led blink - switch interface - lcd (LM016L) interfacing - motor interfacing using L293D - 4X4 keypad interfacing - UART - analog to digital converter (ADC) - timers - pulse width modulation (PWM) - interrupts - simulation and hardware - project

ATMEGA32 (AVR)

Introduction to ATMEGA32 microcontroller - introduction to AVR Studio 4 and 5 and PROTEUS software - GPIO - input/output configurations - led blink - switch interface - lcd (LM016L) interfacing - motor interfacing using L293D - 4X4 keypad interfacing - UART - analog to digital converter (ADC) - timers - pulse width modulation (PWM) - interrupts - simulation and hardware - project

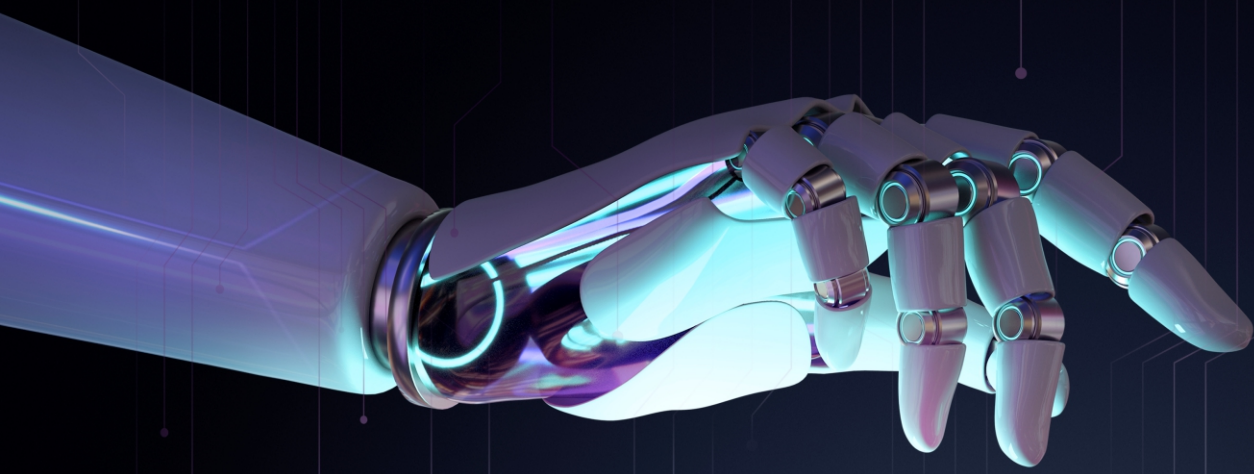
LPC2138 (ARM7)

Introduction to ARM7 LPC2138 microcontroller - introduction to Keil 5 and PROTEUS software - GPIO - input/output configurations - led blink - switch interface - lcd (LM016L) interfacing - motor interfacing using L293D - 4X4 keypad interfacing - UART - analog to digital converter (ADC) - timers - pulse width modulation (PWM) - interrupts - simulation and hardware - project

ARDUINO

GPIO - input/output configurations - switching concepts - serial data transfer - pinmode - analog data concepts - DAC - resolution - PWM - delay function - LDR - menu driven device concept - pattern printing - LCD - DHT11 - relay interfacing - 7 segment display - BJT - MOSFET - PIR - i2c - spi - multiple Arduino communication - Arduino as master and slave - sensor integration - Project





SERIAL PERIPHERAL INTERFACE(SPI)

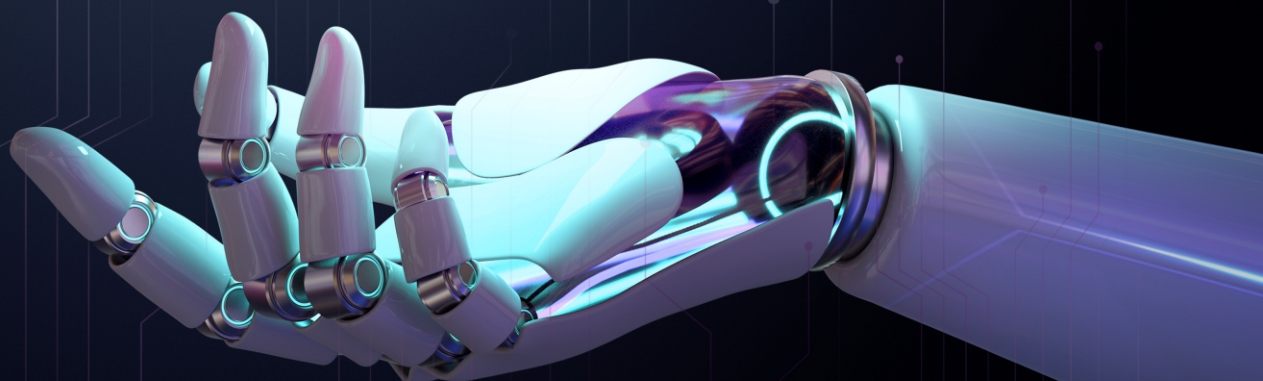
Introduction to SPI - working with block diagram - pin configuration - advantages and disadvantages - to transmit a single character from master to slave

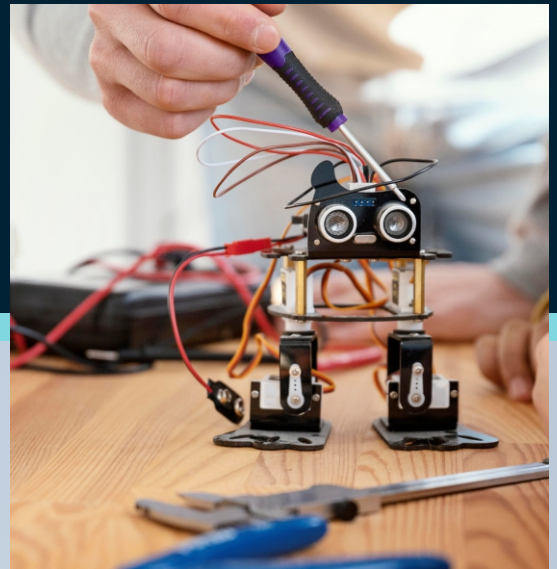
INTER INTEGRATED CIRCUIT(I2C)

Introduction to I2C - working with block diagram - pin configuration - advantages and disadvantages - to transmit a single character from master to slave

INTERNET OF THINGS (IOT)

Introduction to ESP8266 and Nodemcu - setting up the Arduino development environment for the ESP8266 - Functionalities of ESP8266 - Pin configuration - reading digital signals - reading analog signals - controlling an LED - dimming an LED - controlling a servo motor - measuring data from a digital sensor - using libraries on the ESP8266 - connecting ESP8266 to local WI-Fi network - connecting ESP8266 to a cloud server - LED blink using web interface in ESP8266 - Introduction to Thing-speak - Project





PYTHON

Introduction to python and Thonny software - input and output in python - operators - decision making statements - looping statements - array - string - functions - class - files

RASPBERRY PI

Introduction to raspberry pi - Installation of raspberry pi - pin configuration - LED blink - controlling brightness of an led by using pwm - buzzer - making a user interface to control pwm power of led and motors - changing the colour of an RGB led - switch interfacing - controlling GPIO outputs using a web interface - controlling servo motor - controlling dc motor - toggling with a push switch - centre off toggle switch or slide switch - rotary(quadrature) encoder - detecting movement - GPS - intercepting key presses - intercepting mouse movements - measuring lights - detecting methane - measuring distance - displaying sensor value - LCD interfacing - simple soundboard - introduction to face recognition - installation - face detection - yawn detection



TECHNOLOGIES

- Global Positioning System(GPS) module
- Global System for Mobile communication(GSM) module
- Bluetooth(HC-05,HC-06) module
- Zigbee module
- Radio Frequency Identification(RFID) module

SENSORS

- IR
- PIR (Motion sensor)
- DHT-11,DHT -22 (Temperature-humidity sensor)
- MPU-6050 (Gyroscope Accelerometer sensor)
- MQ-02, MQ-03 (Gas/Alcohol detecting sensor)
- GY -61 (Accelerometer sensor)
- HC-SR04 (ultrasonic sensor)

PCB DESIGN

Introduction to pcb design - Introduction to Eagle software - schematic diagram - printed circuit board concepts - Layout design - Layout design with complex circuits

REAL TIME OPERATING SYSTEM (RTOS)

Introduction to Operating system - Functions of OS - Types of operating system - introduction to RTOS - freeRTOS - task - different states of task - creating and deleting a task - task delay function - Multitasking - scheduling - priority - starvation - queue management - semaphore




CERTIFIED PG DIPLOMA IN EMBEDDED SYSTEMS & ROBOTICS

DURATION: 360hrs (6 Months)




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