
COURSE CURRICULUM

(For All Courses)

(Python, Artificial Intelligence, Machine Learning ,Deep Learning , Data Analytics, Computer vision , R Programming, Embedded System, Internet of Things, PCB Design, Arduinio, FPGA, Raspberry Pi, Matlab)

INTERNSHIP ON PYTHON

+ Introduction to python

PYTHON NOTEBOOKS

- + Installing & Working with Python IDLE
- + Configuring Environmental Variables - Command Window
- + Installing Anaconda Navigator (Jupyter Notebook)
- + Working with Anaconda Navigator (Spyder Notebook)
- + Working with Google Colab
- + Working with Pycharm
- + Working with Libraries

PYTHON OBJECT & DATA STRUCTURE

- + Simple Arithmetic
- + Introduction to Strings
- + Indexing and Slicing with Strings
- + String Properties and Methods
- + Print Formatting with Strings
- + Lists in Python

- + Dictionaries in Python
- + Tuples with Python Sets in Python
- + Booleans in Python
- + I/O with Basic Files in Python

PYTHON OBJECT & DATA STRUCTURE

- + Comparison Operators in Python
- + Chaining Comparison Operators in Python with Logical Operators

PYTHON STATEMENTS

- + If Elif and Else Statements in Python
- + For Loops in Python
- + While Loops in Python
- + Useful Operators in Python
- + List Comprehensions in Python

METHODS & FUNCTIONS

- + Methods and the Python Documentation
- + Introduction to Functions
- + Basics of Python Functions
- + Logic with Python Functions
- + Tuple Unpacking with Python Functions
- + *args and **kwargs in Python
- + Lambda Expressions, Map, and Filter Functions

OBJECT ORIENTED PROGRAMMING

- + Attributes & Class Keyword
- + Class Object Attributes and Methods
- + Inheritance and Polymorphism

WARRIORS WAY COACHING PROGRAM

+ Special(Magic/Dunder) Methods

+ MODULES AND PACKAGES name and "main" Errors and Exceptions Handling

+ Pylint Overview

DECORATORS & GENERATORS

+ Decorators with Python Overview

+ Generators with Python

ADDITIONAL PYTHON MODULES

+ Python Collections Module

+ Opening and Reading Files and Folders

+ Python Datetime Module

+ Python Math and Random Modules

+ Python Debugger

+ Python Regular Expressions

+ Timing Your Python Code

+ Zipping and Unzipping files with Python

+ Setting Up Web Scraping Libraries

+ Grabbing a Title

+ Grabbing an Image

+ Book Examples

WORKING WITH IMAGES

+ Introduction to Images with Python

WORKING WITH FILES

+ Working with CSV Files in Python

+ Working with PDF Files in Python

EMAILS WITH PYTHON

-  Sending Emails with Python
-  Receiving Emails with Python

ARTIFICIAL INTELLIGENCE

- + Overview of this course | Introduction to AI | How to create basic AI application (Chat bot using DialogFlow)
- + How to install Python & Libraries | Basics of python Programming for AI.

COMPUTER VISION

- + Introduction to Computer Vision | How to install computer vision libraries
- + Moving Object Detection and tracking using OpenCV
- + Face Detection and Tracking using OpenCV
- + Object Tracking based on color using OpenCV
- + Face Recognition using OpenCV
- + Face Emotion recognition using 68-Landmark Predictor OpenCV

DEEP LEARNING

- + Introduction to Deep learning | How to install DL libraries
- + Designing your First Neural Network
- + Object recognition from Pre-trained model
- + Image classification using Convolutional Neural Network
- + Hand gesture recognition using Deep Learning
- + Leaf disease detection using Deep Learning
- + Character recognition using Convolutional Neural Network
- + Label reading using Optical Character recognition
- + Smart Attendance system using Deep Learning

WARRIORS WAY COACHING PROGRAM

- + Vehicle detection using Deep Learning
- + License plate recognition using Deep Learning
- + Drowsiness detection using Deep Learning
- + Road sign recognition using Deep Learning

MACHINE LEARNING

- + Introduction to Machine learning | How to install ML libraries
- + Evaluating and Deploying the various ML model
- + Fake news detection using ML
- + AI snake game design using ML

NATURAL LANGUAGE PROCESSING

- + Introduction to NLP & it's Terminology | How to install NLP Libraries NLTK
- + Title Formation from the paragraph design using NLP
- + Speech emotion analysis using NLP

DEPLOYING AI IN HARDWARE

- + Cloud-based AI, Object recognition using Amazon Web Service (AWS) & Imagga
- + Deploying AI application in Raspberry Pi with Neural Compute stick & Nvidia Jetson Nano

MACHINE LEARNING

- ✚ Overview A.I | Machine Learning
- ✚ Introduction to Python | How to write code in Google Colab, Jupyter Notebook, Pycharm & IDLE

SUPERVISED LEARNING - CLASSIFICATION & REGRESSION

- ✚ Advertisement Sale prediction from an existing customer using LOGISTIC REGRESSION
- ✚ Salary Estimation using K-NEAREST NEIGHBOR
- ✚ Character Recognition using SUPPORT VECTOR MACHINE
- ✚ Titanic Survival Prediction using NAIVE BAYES
- ✚ Leaf Detection using DECISION TREE
- ✚ Handwritten digit recognition using RANDOM FOREST
- ✚ Evaluating Classification model Performance using CONFUSION MATRIX, CAP CURVE ANALYSIS & ACCURACY PARADOX
- ✚ Classification Model Selection for Breast Cancer classification
- ✚ House Price Prediction using LINEAR REGRESSION Single Variable
- ✚ Exam Mark Prediction using LINEAR REGRESSION Multiple Variable.
- ✚ Predicting the Previous salary of the New Employee using POLYNOMIAL REGRESSION
- ✚ Stock price prediction using SUPPORT VECTOR REGRESSION
- ✚ Height Prediction from the Age using DECISION TREE REGRESSION
- ✚ Car price prediction using RANDOM FOREST
- ✚ Evaluating Regression model performance using R-SQUARED INTUITION & ADJUSTED R-SQUARED INTUITION

WARRIORS WAY COACHING PROGRAM

- + Regression Model Selection for Engine Energy prediction.

UNSUPERVISED LEARNING – CLUSTERING

- + Identifying the Pattern of the Customer spent using K-MEANS CLUSTERING
- + Customer Spending analysis using HIERARCHICAL CLUSTERING
- + Leaf types data visualization using PRINCIPLE COMPONENT ANALYSIS
- + Finding Similar Movie based on ranking using SINGULAR VALUE DECOMPOSITION

UNSUPERVISED LEARNING – ASSOCIATION

- + Market Basket Analysis using APIRIORI
- + Market Basket Optimization/Analysis using ECLAT

REINFORCEMENT LEARNING

- + Web Ads. Click through Rate optimization using UPPER BOUND CONFIDENCE

NATURAL LANGUAGE PROCESSING

- + Sentimental Analysis using Natural Language Processing
- + Breast cancer Tumor prediction using XGBOOST

DEEP LEARNING

- + Bank Customer classification using ANN
- + Pima-Indians Diabetes Classification using CONVOLUTIONAL NEURAL NETWORK
- + A.I Snake Game using REINFORCEMENT LEARNING

DATA ANALYTICS

- ✚ Introduction to Artificial Intelligence, Data Analytics & Road Map to become a Data Scientist

EXCEL

- ✚ Data Preparation - Power Query & Tables
- ✚ Data analytics- Formula & Pivot Table
- ✚ Story Telling - Charts & Dashboard
- ✚ Automation - VBA Macros & Power Query

STATISTICS & PROBABILITY

- ✚ Descriptive Statistics - Mean, Mode, Median, Quartile, Range, InterQuartile Range, Standard Deviation
- ✚ Probability - Permutations, Combinations
- ✚ Population and Sampling
- ✚ Probability Distributions - Normal, Binomial and Poisson Distributions
- ✚ Hypothesis Testing & ANOVA - One Sample and Two Samples - z Test, t-Test, F Test and Chi-Square Test

BI TOOLS - TABLEAU

- ✚ Connect Tableau to a Variety of Datasets
- ✚ Analyze, Blend, Join, and Calculate Data
- ✚ Visualize Data in the Form of Various Charts, Plots, and Maps

BI TOOLS - POWER BI

- ✚ Connect Tableau to a Variety of Datasets
- ✚ Visualize Data in the Form of Various Charts, Plots, and Maps and Calculate Data

PYTHON

- + Introduction to Python & Installing Python and its Libraries
- + Basic Python Programming for Data Analytics

NUMPY & PANDAS

- + Python Numpy functions
- + Pandas for Data analytics in Python

DATA VISUALIZATION

- + Matplotlib for data visualization
- + Seaborn for data visualization

KAGGLE EXPLORATORY

- + Kaggle Dataset and Notebooks

DATABASE - SQL

- + SQL basics for Data analytics - Part-1
- + SQL basics for Data analytics - Part-2

DATABASE - MONGODB

- + MongoDB basics for Data analytics

MACHINE LEARNING

- + Introduction to Machine Learning & its libraries
- + Evaluating and Deploying Machine Learning Classification algorithm for classification of State of Electric power system

DEEP LEARNING

- + Introduction to Deep Learning & its libraries
- + Covid-19 Detection using X-Ray Images with CNN

NATURAL LANGUAGE PROCESSING

 Tag Identification system using NLTK

DEEP LEARNING

SECTION 1: COURSE OVERVIEW

- + Introduction to Deep Learning
- + Basic Computer Vision

SECTION 2: ARTIFICIAL NEURAL NETWORK

- + Neurons & Perceptron
- + Activation Function
- + Gradient Descent
- + Stochastic Gradient Descent
- + Backpropagation
- + Artificial Neural Network – Project 1

SECTION 3: DEEP NEURAL NETWORK

- + Optimization Algorithms – SGD, Momentum, NAG, Adagrad, Adadelta , RMSprop, Adam
- + Batch Normalization
- + Hyperparameter tuning
- + Interpretability
- + Deep Neural Network – Project 2

SECTION 4: CONVOLUTIONAL NEURAL NETWORK

- + Convolutional Neural Network & its Layers
- + CNN Architecture
- + Different frameworks on Deep Learning (Tensorflow, Keras, PyTorch & Caffe)
- + Object Recognition using Pre Trained Model – Caffe – Project 3
- + Image classification using Convolutional Neural

WARRIORS WAY COACHING PROGRAM

- + Network from Scratch – Tensorflow & Keras – Project 4
- + Custom Image Classification using Transfer Learning
 - Project 5
- + YOLO Object recognition – Project 6
- + Image Segmentation – Project 7
- + Project using MxNet – Project 8
- + Project using PyTorch – Project 9
- + Social Distancing detector – Project 10
- + Face Mask detector – Project 11

SECTION 5: RECURRENT NEURAL NETWORK

- + Introduction to RNN and LSTM
- + Project using RNN – Project 12

SECTION 6:

- + Introduction CUDA Toolkit and cuDNN for deep learning
- + Getting started with the Intel Movidius Neural Compute Stick – Project 13
- + Custom Object classification using Nvidia Jetson – Project 14

COMPUTER VISION

- ✚ Introduction to Python & Computer Vision | Python Installation & Installing Libraries | Basic CV | Reading an image | Display, Writing, Saving an Image | Draw a line, circle, rectangle | Draw a text string | Find and Draw Contours | Image Resizing | Blurring an Image
- ✚ Create Border around Images | Convert an image from one color space to another | Scaling, Rotating, Shifting, and Edge Detection | Erosion and Dilation of images | Denoising of colored images | OpenCV Bitwise AND, OR, XOR, and NOT | Play a video using OpenCV | Video acquisition from the camera | Video acquisition from the Mobile Camera
- ✚ OpenCV Haar Cascades - Face detection | Eye detection | Mouth detection | Full/partial body detection
- ✚ Multi-template Matching with OpenCV
- ✚ OCR a Document, Form with Tesseract & OpenCV
- ✚ Object Tracking using OpenCV
- ✚ Watermarking images with OpenCV
- ✚ Saving Key event video clips with OpenCV
- ✚ Determining Object Shape and Color with OpenCV
- ✚ Real-time Panorama & Image Stitching with OpenCV
- ✚ Barcode reader using Computer Vision
- ✚ OpenCV Video Augmented Reality
- ✚ Recognizing digits with OpenCV and Python
- ✚ Document Scanner using OpenCV
- ✚ Harry Potter Invisible Cloak

R PROGRAMMING

- ✚ Introduction to R | Installing R studio | Fundamentals of R
(Basic Syntax | Comments | Operators | Keywords | Data Types
)
- ✚ Variables | Decision Making | Control Flow | Functions
- ✚ Data Structures - Strings | Vectors | Lists | Arrays | Matrices |
Factors.
- ✚ Data Frames
- ✚ OOP's Concepts - Classes | Objects | Encapsulation
- ✚ OOP's Concepts - Polymorphism | Inheritance | Abstraction |
Looping over Objects
- ✚ Error Handling | File handling | Packages in R
- ✚ Data Interfaces | Data Visualization
- ✚ R Statistics
- ✚ R Regression

PCB DESIGN, EMBEDDED
DESIGN, ARDUINO, FPGA,
RPI, INTERNET OF THINGS

PCB DESIGN

- + Introduction to PCB Design and Terminologies and Installation of Orcad Trail version
- + Introduction to Schematic Capture
- + Introduction to Allegro and Footprint Creation
- + Importing Schematics in allegro ,Placement and route
- + Gerber Creation, BOM, PDF
- + How to Design a 8051 Microcontroller Board
- + Library Creation
- + Schematics Design
- + Footprint Creation
- + Design rules check-Import and Placement
- + Layout
- + Layout Design , Gerber Creation, Recap, schematic design consideration,Layout Design Consideration

EMBEDDED SYSTEM DESIGN & IOT

- + Introduction to Embedded System Design
- + Choosing the Right Processor and Embedded Product Life cycle
- + Challenges and Design Issues in Embedded Systems,
- + Introduction to Real-Time Concepts,
- + IoT Trends, IoT Architecture, IoT Applications, IoT Standards, and Protocols,

8051-Week 2

- + 8051 Architecture-Keil
- + Switch ,Relay,
- + UART,SPI
- + LCD,IIC
- + 8051 Mini Project-Bluetooth based Home automation

ARM7 -Week 3

- + ARM Architecture-Keil, LED Blinking
- + Switch ,Relay,
- + UART,SPI
- + LCD,IIC
- + ARM Mini Project -IoT based weather monitoirng system

CORTEX M4-Week 4

- + CORTEXM4 LPC4088 Architecture-Keil, LED Blinking
- + Switch ,Relay,
- + UART,SPI
- + LCD,IIC

WARRIORS WAY COACHING PROGRAM

- + Cortex -M4 - Temperature Monitoring using Zigbee and LORA
PIC -Week 5
- + Introduction to PIC Architecture
- + MPLABIDE and LED Blinking
- + Switch ,Relay, PWM
- + UART,SPI
- + LCD,IIC
- NodeMCU/ESP8266 -Week 6
- + Introduction to NODE MCU
- + Led,switch,relay,UART
- + Iot Temperature Data Logging
- + Build Your Home Automation with ESP8266 and Control
Devices from Anywhere in the World
- + Conclusion and Wrap up-Graduation Day

ARDUINO

- + Overview of this course | Details about Arduino & Application
- + Installing Arduino Software & Libraries | Programming Arduino
- EMBEDDED SYSTEM - ARDUINO
- + Overview on Embedded Systems | LED , Switch & Buzzer with Arduino
- COMMUNICATION-PROTOCOL
- + Rat Trap design using LDR & Laser Arduino | ADC - SPI Protocol
- + Bluetooth controlled Light with Arduino | UART Protocol
- + I2C LCD with Arduino | I2C Protocol
- + RFID based authentication system using Arduino | UART Protocol
- SENSORS
- + Motion Detection using PIR & IR Sensor | Digital Sensor
- + Temperature Monitoring System using Temperature sensor | Analog Sensor
- + Distance Measurement using Ultrasonic Sensor
- + Water level Detection & Alert system | Analog & Digital Sensor
- + Humidity Detection & Alert using DHT11 Sensor
- + Water quality detection using PH Sensor | UART Protocol
- + Waterflow detection using Flow sensor | Pulse sensor
- + Keypad with Arduino for Stop Clock
- DISPLAY
- + Simple Message Chat using LCD Display Arduino
- + Switch press Counter using 7-Segment display
- + TFT Display with Arduino

WARRIORS WAY COACHING PROGRAM

MOTOR

- + DC Motor Speed Control using TrimPot | DC Motor
- + Automatic Door lock system using PIR & Servo | Servo Motor
- + Stepper Motor Control using Arduino

ROBOTICS SYSTEM - ARDUINO

- + Robot Design | Bluetooth & Voice controlled robot using Arduino
- + Obstacle Avoidance Robot using Ultrasonic

ELECTRICAL SYSTEM - ARDUINO

- + Power Monitoring system | ADC | SPI Protocol
 - + Fault Detection | ADC
- ## Internet of Things – ARDUINO

- + Industry Monitoring System using IoT | ESP8266

MATLAB – ARDUINO

- + RADAR using Ultrasonic & Arduino with Matlab

ARDUINO BONUS

- + Audio speaker from a Signal using Arduino & Signal Generator
- + Li-Fi based Data transmission using Arduino
- + Brain Controlled Robot using Arduino

FPGA

- + Introduction to FPGA
- + Introduction to VHDL , How to create a Project in Xilinx ISE .
- + Operators and Data Flow Modeling (VHDL)
- + Structural & Behavioral Modeling
- + Creating a Test Bench
- + How to Design a Spartan 6 FPGA Board
- + FPGA Programming for Blinking LED ,SWITCH, Relays and Buzzer
- + UART Programming on FPGA
- + LCD, SEVEN SEGMENT Programming on FPGA
- + ADC and DAC Programming on FPGA
- + Bluetooth and Relay Programming -Bluetooth Home Automation using FPGA
- + Internet of Things using FPGA -Part 1 (Interfacing with WIFI)
- + Internet of Things using FPGA -Part 2 (Sending Temperature data to Cloud)
- + Motor control using FPGA (PWM)
- + Embedded system Design using FPGA (C Based programming on FPGA)
- + Median Filter on Spartan 6 FPGA
- + Edge Detection on FPGA using C Language
- + IoT Programming on FPGA using C Language
- + Debugging with Chip scope PRO
- + Introduction to Python Programming on FPGA
- + Yolo object detection on FPGA
- + Real time edge detection using ZYNQ FPGA (pynq)
- + Real time Moving object detection using ZYNQ FPGA (pynq)
- + Discrete Wavelet Transform using Spartan 6 FPGA(C Language)
- + Image Segmentation using Spartan6 FPGA(Xilinx XPS)

WARRIORS WAY COACHING PROGRAM

- + Introduction to Vivado Design Suite
- + Implementing LED , UART Using - Vivado Design Suite
- + Machine Learning with Python in PYNQ
- + OpenCV for Image Processing & Video_processing (PYNQ with Python)-ZYNQ FPGA
- + Conclusion and Future of VLSI

RASPBERRY PI

- + Overview of this course | Details about Raspberry Pi & its Application
- + Installing Operating System in Raspberry Pi | Basic Python Programming
- + Overview on Embedded Systems | Digital I/O with Raspberry Pi
- + Analog sensor interface using MCP3008 ADC | SPI Protocol
- + RFID based authentication system using Arduino | UART Protocol
- + Temperature & Humidity Detection & Alert using DHT11 Sensor
- + Water quality detection using PH Sensor | UART Protocol
- + Waterflow detection using Flow sensor | Pulse sensor | Interrupt
- + Message Transmission using MQTT & UDP Protocol
- + Sending Email Alert using SMTP Protocol
- + Simple Message Chat using LCD Display using Raspberry Pi
- + Touch screen display Interface with Raspberry Pi
- + DC Motor Speed Control using TrimPot | DC Motor
- + Automatic Door lock system using PIR | Servo Motor & Stepper Motor
- + Smart Energy meter system | ADC | SPI Protocol
- + Industry Monitoring System using IoT | Cloud
- + Webpage design for appliance control | Webserver | HTTP
- + Mobile controlled appliance via Internet | Application
- + Video surveillance system using Webserver

WARRIORS WAY COACHING PROGRAM

- ✚ Weather reporter system using Weather Cloud | Smart Umbrella
- ✚ Interfacing USB Webcam | Pi Camera | Android Mobile camera with Raspberry Pi
- ✚ Face Detection ,Tracking & Recognition using Raspberry Pi
- ✚ Simple Book reader with OCR & Text to speech conversion using Raspberry Pi
- ✚ Obstacle Avoidance Robot using UltrasonicDay 25 - Color Following Robot
- ✚ Baby emotion recognition & Alert system | Music Play
- ✚ Blind assistance system for Object recognition | Deep Learning
- ✚ Re-speaker 4 Mic array interface with Raspberry Pi
- ✚ 360 Degree LIDAR Interface with Raspberry Pi | ROS
- ✚ Brain Controlled Robot using Raspberry Pi & Brainsense

INTERNET OF THINGS

IoT Introduction and Architectures

- ✚ Introduction to IoT
- ✚ IoT Communication Protocols
- ✚ Introduction to ESP32 and NodeMCU
- ✚ IoT Clouds, Analytics & Data Science
- ✚ Sensors for IoT

IoT using Thingspeak

- ✚ Sending Data to Thingspeak -Arduino+Humidity+Air quality(Weather monitoring system)
- ✚ How to Analyze IoT Data in ThingSpeak
- ✚ Deploying a Machine learning Model on the Cloud
- ✚ Thingspeak for IoT in agriculture
- ✚ Smart Humidity Sensor – ThingSpeak, MATLAB, and IFTTT

IoT with Microsoft Azure

- ✚ Introduction to IoT with Microsoft Azure
- ✚ Implementing IoT with Azure
- ✚ Edge Computing and Analytics
- ✚ Cognitive services, Computer vision API
- ✚ Weather monitoring station using Microsoft Azure and Arduino

IoT Projects and Case Study

- ✚ Home automation using Google Assistant
- ✚ Industrial IoT using Zigbee and WIFI(Windmill case study)
- ✚ Recording sensor data to google sheet using IFTTT with Arduino and sending alerts
- ✚ Real time Video surveillance esp32cam and Blynk App

WARRIORS WAY COACHING PROGRAM

- ✚ Predictive Maintenance of a Duct Fan Using Nodemcu, ThingSpeak and MATLAB

IoT with AWS IoT

- ✚ Introduction to AWS IoT, Setting up Free tier AWS, AWS CLI, Policies, Security Credentials, and Testing
- ✚ Raspberry PI3 with AWS IOT SDK
- ✚ SNS Push Notifications, AWS IoT Analytics
- ✚ AWS Lambda Functions for IoT
- ✚ HTTPs Arduino sketch to AWS IoT Core for the ESP8266 and ESP32
- ✚ Using Mongoose OS on embedded devices for AWS IoT
- ✚ Storing data into the Dynamo Database from the AWS IoT control panel
- ✚ AWS Quicksight for data analytics and visualizations
- ✚ AWS Device Shadows and multiple Pub/Sub's
- ✚ Weather monitoring station using AWS IOT

MATLAB

- ✚ Getting Started With Matlab
- ✚ Image processing using Matlab
- ✚ Video Processing using Matlab
- ✚ Medical Image Processing using Matlab
- ✚ Graphical User Interface Matlab
- ✚ App development using Matlab
- ✚ Computer Vision using Matlab
- ✚ Fuzzy logic design using Matlab
- ✚ Neural Network using Matlab
- ✚ Machine Learning using Matlab
- ✚ Deep Learning using Matlab
- ✚ Neuro-Fuzzy Designer using Matlab
- ✚ Image Segmentation using Matlab
- ✚ Image Compression using Matlab
- ✚ Feature Extraction using Matlab
- ✚ Face Recognition using Matlab
- ✚ Augmented Reality using Matlab
- ✚ Image Denoising using Matlab
- ✚ Arduino Programming using Matlab
- ✚ Image Quality Metrics using Matlab
- ✚ Steganography using Matlab
- ✚ Real-time Object detection using Matlab
- ✚ Raspberry Pi programming using Matlab
- ✚ Speech Processing using Matlab
- ✚ Audio Processing using Matlab
- ✚ Data Hiding using Matlab
- ✚ Cryptography using Matlab

WARRIORS WAY COACHING PROGRAM

- Machine Learning and IoT using Matlab
- SLAM using Matlab
- Semantic Segmentation using Deep learning Matlab