



Certified Python (AI) Developer (CPD)

Course Outline

<https://globalicttraining.com>

Duration

- 4 days

The global artificial intelligence market is expected to reach USD 35,870.0 million by 2025 from its direct revenue sources, growing at a CAGR of 57.2% from 2017 to 2025. And the Deep Learning market in particular is expected to be worth USD 1772.9 Million by 2022, growing at a CAGR of 65.3% between 2016 and 2022

Technologies such as deep learning, intelligent robots and neuro-linguistic programming under Artificial Intelligence have been aiding in the enhancement of the existing computing systems to produce high value prediction.

Course Objectives

The objective of the course is to present an overview of artificial intelligence (AI) principles and approaches in industry based on best practices. The application of classical models used in Machine Learning and Deep Learning in terms of quality parametric would be addressed using both APIs and Python.

This course will focus in the implementation of one of the latest APIs in AI, with focus on Tensor Flow. In addition, the certification leverages intuitive approach to build complex models with human like intelligence that will help to solve real-world problems using Machine Learning and Deep Learning techniques.

After the course, participants will have a good understanding to build intelligent computing models in Anaconda Jupyter Notebook. Participants will appreciate that Deep Learning is showing promise in areas where the traditional Artificial Intelligence approaches have failed in the past.

Job Role in NICF / Target Audience

- Senior Data Engineer
- Cloud Architect
- Data Scientist
- Business Analyst
- Dev Ops Engineer
- Applications Developer
- IHL students

Pre-requisites

Participants are preferred to have experience in software development or business analysis.

Program Structure

This is a 4-day intensive training program with the following assessment components.

Component 1. Written Examination

Component 2. Project Work Component (PWC)

These components are individual based. Participants will need to obtain 70% in both the components in order to qualify for this certification.

Scope

- Introduction to AI and its applications
- Python Programming Fundamentals
- Python for data preprocessing & wrangling
- NoSQL databases and Applications of MongoDB
- MongoDB Fundamentals
- AI Categories & Feature Engineering
- Convolutional Neural Networks & its applications
- AI with Python using NLTK

Course Outcomes

- Acquire knowledge on AI using Python, Tensorflow and Keras
- Implement Machine Learning to address Train-Test and Fit challenges
- Implement Deep Learning with emphasis on Cost-Loss optimization
- Develop using Anaconda - Jupyter notebook in Python using multiple APIs
- Explore case studies in the application of AI in emerging technologies

Course Session Schedule

	0900 – 1030	1045 – 1230	1330-1530	1545-1700
Day 1	Introduction to Artificial Intelligence	Practical Python	Tensorflow Keras	AI Analytics
Day 2	Introduction to Machine Learning (ML)	Develop ML Models	Train-Test vs Fit Techniques	PyMongo
Day 3	Introduction to Deep Learning (DL)	Develop ANN Models	Optimization techniques	Reinforcement Learning
Day 4	Application of Text Analytics – NLP	Sentiment Analysis, Profiling, BoT	Revision	40 MCQ Examination

Course Outline

Unit 1. Introduction to Artificial Intelligence

- Introduction to AI
- Goals and applications AI
- Differences between AI, ML & DL
- Classification of AI algorithms
- Supervised learning
- Unsupervised learning
- Reinforcement learning

Unit 2. Jumpstart Python Programming using Tensorflow, Keras and Pytorch API

- Advantages of Python & Program execution
- Variables and assignments
- Data types
- Control Flow- Logical Comparisons , Boolean Conditionals
- Looping Constructs
- Functions and Function Arguments
- Object-oriented programming in Python
- Dictionaries, Sets, Classes, Inheritance

Unit 3. Benchmark Machine Learning (ML) models using Train-Test and Fit

- Introduction to Packages
- Packages Cheat Sheet.
- Implementation using
- Regression.
- Linear Regression model using Numpy and Matplotlib.
- Classification.
- Explore Classification Algorithms.
- Clustering
- K Means

Unit 4. Impact of Big Data on NoSQL databases using Pymongo

- Introduction to Databases
- Basic of NoSQL
- Categories of NoSQL Databases
- Hands On
- Download and Installation (Server and Cloud based)
- Explore MongoDB Atlas Analytics features
- Basic, Intermediate and Advanced SQL commands
- PyMongo

Unit 5. Feature Engineering of Deep Learning ANN using CNN and RNN

- Keras Core defined. Hello World
- Keras implementation. Image Classification
- Build a Neural Network to do Classification.
- Train-Test Neural Network.
- Evaluate the model.
- Lets draw a flow chart of the major steps.
- Define factors that can influence a Good Fit.

- Review the Classification Reports.

Unit 6. Text processing application for Natural Language Processing (NLP)

- Introduction to Text Analytics.
- Classification
- Tokenization
- Stopwords
- Stemming,
- Tagging
- Parsing
- Semantics
- Lemmatization,
- Application of Sentiment Analysis
- Bag of Words, TF-IDF, Word Embeddings.
- Logistics, SVM, Random Forest.

Unit 7. Application of Text Processing in Sentiment Analysis, Profiling, BOTs

- The future of BoT today.
- Eliza, the Rogerian Therapist
- Implementation of a simple BoT program.
- Implementation of a GUI Chatbot using Python.

Unit 8. Cognitive Challenges and Security Risk

- Security Defined.
- Top 10 Reasons and Fixes of Security issues.
- The Pickle API Case study.
- Programmers Guide to addressing security issues.
- Cisco's perspective of Cognitive Challenges in AI.

Hands-On

Participants will have guided hands-on sessions on building Machine Learning and Deep Learning models. During this session they will gain understanding of several algorithms in building a successful intelligent computing system.

Hands-on 1: Programming Python using Tensorflow, Keras and Pytorch.

Hands-on 2: Benchmark Machine Learning models (ML) using APIs.

Hands-on 3: Optimization of a Keras CNN based on Cost-Losss.

Hands-on 4: Text Processing using NTLK

Written Assessment

As part of the written examination, each participant will be assessed individually on the last day of the training for their understanding of the subject matter and ability to evaluate, choose and apply them in specific context and also the ability to identify and manage risks. The assessment focuses on higher levels of learning in Bloom's taxonomy: Application, Analysis, Synthesis and Evaluation.

This written examination will primarily consist of 40 multiple choice questions spanning various aspects as covered in the program. It is an individual, competency-based assessment.

Tools/Software used

- Python
- Tensorflow
- Keras
- Pytorch
- Natural Language Toolkit (NLTK)