



3GIRPS
INSTITUTE OF RESEARCH & POLICY STUDIES
BUILD INDIA TO SERVE THE WORLD

**3G INSTITUTE OF RESEARCH AND POLICY STUDIES
PRESENTS**

**90+ HOURS
DEEP LEARNING**

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DEEP LEARNING

1.0 Foundations (5+Hrs)

1.1 Python

- 1.1.1. Overview of python
- 1.1.2. Basics of python
- 1.1.3. Python datastructure
- 1.1.4. Python libraries for AI & ML
 - 1.1.4.1. Numpy – Statistical Analysis
 - 1.1.4.2. Pandas –
 - 1.1.4.3. Matplotlib – Data visualisation
- 1.1.5. Debugging methodology
- 1.1.6. Hands on sessions
- 1.1.7. Milestone project

1.2 Statistics

- 1.2.1 Probability
- 1.2.2 Basic statistics
- 1.2.3 Terminology in statistics
- 1.2.4 Distributions
- 1.2.5 Statistical theorems
 - 1.2.5.1. Central Limit theorem
 - 1.2.5.2. Baye's theorem
- 1.2.6 Descriptive analysis and descriptive statistics
- 1.2.7 Inferential analysis and Inferential statistics
- 1.2.8 Statistical Significance
- 1.2.9 Hypothesis testing
- 1.2.10 Bias – Variance trade-off



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2.0 Pre-set up (3+Hrs)

- 2.1. System requirements
- 2.2. Installations
- 2.3. Environment setup

3.0 Machine Learning (15+Hrs)

- 3.1. Introduction to Machine Learning**
- 3.2. Analytics and its types
- 3.3. Machine Learning and its types
- 3.4. Algorithms and techniques

4.0 Feature Engineering (4+Hrs)

- 4.1. Model selection and tuning
- 4.2. Feature extraction
- 4.3. Error metrics and evaluation
- 4.4. Milestone project

5.0 Decision making methodology (6+Hrs)

- 5.1. Genetic Algorithm
- 5.2. Linear programming
- 5.3. Monte Carlo simulations
- 5.4. Neural networks concepts

6.0 Deep Learning (18+Hrs)

- 6.1 Introduction to deep learning
- 6.2 Insights of Neural networks
- 6.3 Frameworks of Neural networks
 - 6.3.1 Tensorflow
 - 6.3.2 Keras

7.0 Neural Networks (13+Hrs)

7.1 Basics

- 7.1.1 What is neuron?
- 7.1.2 What is neural network?
- 7.1.3 Perceptrons
- 7.1.4 Hidden Layers
- 7.1.5 Neuron predictions
- 7.1.6 Neuron training
- 7.1.7 Back propogation

7.2 Intermediate

- 7.1.1 No linear activation function
- 7.1.2 Back propagation
- 7.1.3 Vanishing and exploding gradient descent
- 7.1.4 How to mitigate over fitting?
- 7.1.5 Pre-trained models
- 7.2.6 Transfer learning – Resnet

8.0 Artificial Neural Network – ANN (15+Hrs)

- 8.1 What is ANN?
- 8.2 Building an ANN model
- 8.3 Fine-tuning the model
 - 8.3.1 Evaluating
 - 8.3.2 Defect diagnosing
 - 8.3.3 Improving the model
 - 8.3.4 Tuning the ANN model
- 8.4 Hands-on project

9.0 Convolution Neural Network - CNN (4+Hrs)

- 9.1 What is CNN?
- 9.2 Building a CNN model
 - 9.2.1 CNN - operation
 - 9.2.2 ReLU layer
 - 9.2.3 Pooling
 - 9.2.4 Flattening
- 9.3 Fine-tuning the model
 - 9.3.1 Evaluating
 - 9.3.2 Defect diagnosing
 - 9.3.3 Improving the model
 - 9.3.4 Tuning the CNN model
- 9.4 Hands-on project

10.0 Recurrent Neural Network (5+Hrs)

- 10.1 What is RNN?
- 10.2 Building a RNN model
- 10.3 Fine-tuning the model
 - 10.3.1 Evaluating
 - 10.3.2 Defect diagnosing
 - 10.3.3 Improving the model
 - 10.3.4 Tuning the RNN model
- 10.4 LSTM's
- 10.5 Hands-on project

11.0 Reinforcement learning(5+Hrs)

- 11.1 What is reinforcement learning?
- 11.2 Markov Decision Process - MDP
- 11.3 Dynamic programming to solve MDP
- 11.4 Prediction and reinforcement testing(use case)
- 11.5 Milestone project

12.0 Computer vision (5+Hrs)

- 12.1 What is computer vision?
- 12.2 Importing data(image & video) through different methods
- 12.3 Image processing
 - 12.3.1 Converting into matrix
 - 12.3.2 Color spaces
 - 12.3.3 Contouring
 - 12.3.4 Filtering
 - 12.3.5 Feature extraction
 - 12.3.6 Sizing and more..
- 12.4 Image recognition and its applications
- 12.5 Hands -on Project

13.0 Advanced AI (5+Hrs)

- 13.1 Advanced Computer vision
- 13.2 Image recognition in comparison with Basis NN and CNN
- 13.3 Bi-directional recurrent models
- 13.4 Object detection and image segmentation
- 13.5 OpenCV and tensorflow projects
- 13.6 YOLO, Faster RCNN and SSD models
- 13.7 Examples with pre-trained models
- 13.8 Generative Adversial Network – GANs
- 13.9 Applications of GANs
- 13.10 Hands-on project on facial recognition and identification
- 9.11 Hands-on projection Object identification.

9.0 Career Assistance (3+Hrs)

- 9.1 Resume Building
- 9.2 Internship
- 9.3 Interview preparation
- 9.4 Complete career guidance

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Course Offered

- Internship
- Google AI
- Python
- Ethical Hacking
- Machine Learning - Deep Learning Workshop

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