



Masters PROGRAM

MSc in Computer Science (Deep Learning and Artificial Intelligence)

4 Semesters | 2 Years Course

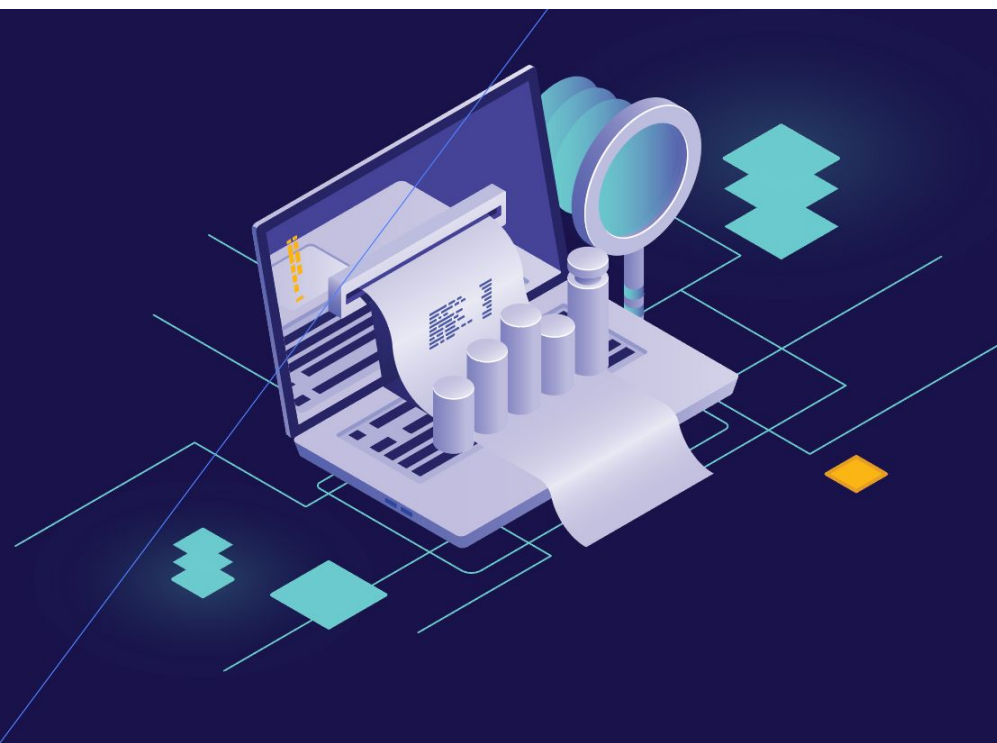


About REVA University

REVA University has been established under the REVA University Act, 2012 of Government of Karnataka and notified in Karnataka State Gazette No. 80 dated 27th February, 2013. The University is empowered by UGC to award degrees in any branch of knowledge under Sec.22 of the UGC Act. The University is a Member of Association of Indian Universities, New Delhi. The main objective of the University is to prepare students with knowledge, wisdom and patriotism to face the global challenges and become the top leaders of the country and the globe in different fields.

The curriculum of each programme is designed with a keen eye for detail by giving emphasis on hands-on training, industry relevance, social significance, and practical applications. The University offers world-class facilities and education that meets global standards.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis on knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in preparing the scheme of instruction.



Dr. P. Shyama Raju
The Founder and Hon'ble
Chancellor, REVA University

About CloudxLab

CloudxLab (CxL) has been a pioneer in the edtech space for the past few years. Founded in 2015, CxL has successfully transformed 1,000's of students' careers by offering world-class certification courses in big data, machine learning and artificial intelligence.

Some of the unique features of CxL are an exclusive gamified learning environment through the lab (read as CloudxLab), highest rated faculty, excellent student support and more.

At Cloudxlab, we are building one of the best gamified learning environments to make technology learning fun and for life. More than 50,000 users across the world have been benefited by our signature courses on Machine Learning and Big Data. Our vision is to upskill people on high-end technologies like Deep Learning, Machine Learning, Big Data and make them employable.

Every domain of computing such as data analysis, software engineering, and artificial intelligence is going to be impacted by Machine Learning. Therefore, every engineer, researcher, manager or scientist would be expected to know Deep Learning.



Sandeep Giri

Founder at CloudxLab

Program Overview



Earn a reputed
Masters Degree from
REVA University



Learn Deep Learning
from industry experts
and become expert in
Deep Learning domain



Online cloud lab for
hands-on for
real-world experience



Placement Support with
career guidance,
resume building and
mock interviews
provided



Best-in-class support
Throughout your
learning journey



Work on
company-sponsored
projects.



Interact with the
international
community of peers
via the discussion
forum.

Course Creators



Sandeep Giri

Founder at CloudxLab

Past: Amazon, InMobi, D.E.Shaw

Course Developer

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Abhinav Singh

Co-Founder at CloudxLab

Past: Byjus

Course Developer

[Know More](#)



Dr. Shinu Abhi

PhD | Fulbright Fellow,
Director, Corporate Training

Course Advisor

[Know More](#)



Praveen Pavithran

Co-Founder at Yatis

Past: YourCabs, Cypress Semiconductor

Course Advisor

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Semester 1

Course 1 : Software Engineering for AI

Unit 1

- Python, Advantages and Disadvantages of Python, Basics of Python, IDE Overview, Programming Basics-List, Tuples, Sets & Dictionaries, Conditional Statements. Concept of Loops & Functions, List Comprehension, Functions, Object Oriented Programming

Unit 2

- Numpy, Pandas, Numpy arrays, Numpy functions, Pandas, Dataframe and manipulations, Visualization Libraries, Matplotlib packages, Distribution plots, Scatter plots, Heat maps

Unit 3

- Introduction to Linux, Working with Linux, Git introduction

Unit 4

- SQL Databases, SQL operations, Introduction to NoSQL

Project

- Churn Email Inbox with Python

Semester 1

Course 2 : Mathematics for Machine Learning

Unit 1

- Statistics, Mean, Mode, Median, Standard deviation, Skews, Variance

Unit 2

- Representing matrices with numpy, Matrix operations, Multiplication, Inverse operations, Solving equations using Gaussian elimination, Vectors, Cross Product, Dot Product, EigenValues, Eigen Vectors

Unit 3

- Calculus, Differentiation, Partial Derivatives, Chain rule, Power Series, Taylor Series, Linearisation, MultiVariate Taylors, Linear Regression, Least Squares. Newton Raphson, Gradient Descent

Unit 4

- Combination, Permutations, Probability theory, Bayes Theorem

Semester 1

Course 3 : Machine Learning Fundamentals

Unit 1

- Hands-on end to end machine learning example with regression

Unit 2

- Introduction to Classification, Metrics for Classification, Multilabel, Multiclass classification

Unit 3

- Training Machine Learning models, Polynomial regression, Logistic regressions, Regularization

Unit 4

- Training and Visualising Decision trees, CART training algorithm, GINI

Semester 1

Course 4 : Advanced Machine Learning

Unit 1

- Support Vector Machines, Linear SVMs, Non Linear SVMs, SVM Regression

Unit 2

- Random Forests, Ensemble Learning, Voting Classifiers, AdaBoost, Gradient Boost, Stacking

Unit 3

- Understand Dimensionality reduction, Manifold Learning, PCA, Kernel PCA

Unit 4

- Unsupervised learning, Clustering, K-Means, DB Scan, Gaussian Mixtures

Projects

Unit 1

- Forecast bike rentals

Unit 2

- Predict Titanic Passenger Survival using Machine Learning and Python

Semester 2

Course 1 : Introduction to Deep Learning

Unit 1

- History of Deep Neural Networks, Backpropagation,

Unit 2

- Keras, Building DNNs, Training DNNs

Course 2 : Advanced Deep Learning

Unit 1

- Advance training techniques for neural networks, Understand issues training large Deep Neural Networks, Regularization for DNNs

Unit 2

- Deep Dive into Tensorflow and its lower level API, Writing custom models, Implementing custom training, Pre-processing large amounts of data for training

Semester 2

Course 3 : Computer Vision for Image and Video

Unit 1

- Introduction to CNNs, Filters, Pooling Layers, Building CNNs

Unit 2

- Overview of popular classification models, Train classification models on a custom dataset

Unit 3

- Introduction to OpenCV, Basic operations with OpenCV, Filters, Thresholding edge detection, Processing videos

Unit 4

- Object Detection, Single Shot Detectors, YOLO, Training YOLO on a custom dataset

Semester 2

Course 4 : Sequence Modelling

Unit 1

- Recurrent Neural Networks, Memory cells, Sequences, Training RNNs

Unit 2

- Forecasting a time series, Simple RNNs, Deep RNNs, Long Sequences, Unstable Gradients

Course 5 : Natural Language Processing

Unit 1

- Generating Shakespearean text using RNNs, Sentiment Analysis

Unit 2

- Encoder-Decoder Network for Neural Machine Transfer, BEAM Search, Attention Mechanisms

Semester 3

Course 1 : Generative Adversarial Networks

Unit 1

- Data representations, Linear Autoencoders, Stacked Autoencoders, Convolutional Autoencoders, Recurrent Autoencoders

Unit 2

- Generative Adversarial Networks, Training GANs, Deep Convolutional GANs, Styling GANs

Course 2 : Reinforcement Learning

Unit 1

- Optimizing Rewards, Policy Search, Open AI Gym, Markov Decision Processes

Unit 2

- Q-Learning, Deep-Q Learning, TF-Agents

Unit 3

- Curiosity Based Learning, Difference between Curiosity Based Learning and Reinforcement Learning

Semester 3

Course 3 : Production and Maintenance of an AI system

Unit 1

- Serving a tensorflow model on a cloud, Tensorflow serving, Create and use a prediction system on the cloud

Unit 2

- Creating lite models, Deploy on embedded devices

Unit 3

- Models with GPUs, Colab

Unit 4

- Training models across multiple devices, Model parallelism, Data parallelism, Distribute strategies for training, Training with tensorflow cluster

Semester 3

Course 4 : Recommendation Engine

Unit 1

- Introduction to Spark MLlib, Collaborative filtering algorithm,

Unit 2

- Build recommendation engine in Spark MLlib using Alternating Least Square algorithm.

Projects

Unit 1

- Neural style transfer project

Unit 2

- Deploy an AI system on the cloud

Semester 4

Thesis Project

Course Description: Thesis Project towards completion of project

Course Objectives: The student should be able to define a problem and formulate a solution for the problem using Deep Learning