



A Unit of Ascent NextGen Technologies

Data Science with AI & Generative AI

Master's Program

Data Science with AI & Generative AI

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Program Overview

Data Science with AI & Generative AI Master's Program

Build a career in **data science and artificial intelligence** with this practical, industry-focused program. It is designed for students and professionals who want to analyse data, build machine learning and deep learning models, and create applications with generative AI.

The course covers **Python, NumPy, Pandas, statistics, machine learning, time series, deep learning with TensorFlow and Keras, NLP, large language models, prompt engineering, RAG, AI agents, LangChain and LlamaIndex**, with an introduction to big data and Hadoop.

Through **case studies, hands-on assignments and a real-time project**, you practise each step of the data science lifecycle: sourcing and preparing data, choosing and tuning models, and presenting results.

By the end of the program, you will be able to **build and evaluate predictive models, train neural networks**, and **develop generative AI applications** such as document chatbots and AI agents.

Key Features

Data Science & AI



Industry-Relevant Curriculum

Python, statistics, machine learning, deep learning, NLP and generative AI in one program.



AI & Machine Learning Focus

Learn algorithms, model building and tuning, and apply them to real-world problems.



Generative AI & Agents

LLMs, prompt engineering, RAG, AI agents, LangChain and LlamaIndex.



Certification

Receive the Data Science with AI & Generative AI certificate from Ascent Software Training Institute.



Hands-On Practical Training

Work with real datasets, case studies and assignments in every module.



Real-Time Project & Case Studies

Build projects such as prediction models, recommendation systems and AI chatbots.



Flexible Learning Options

Online, in-person or hybrid classes. Classroom training at BTM 1st Stage, Bangalore.



Interview Preparation & Placement Assistance

Mock interviews, resume building and job search support.

About Ascent Software Training Institute

Ascent Software Training Institute provides industry-focused IT courses designed to help students and professionals build careers in technology.

Our programs focus on practical learning, real-time projects and industry-relevant skills. With experienced trainers and a structured curriculum, we help learners gain the knowledge and confidence they need in today's IT industry.

Career Opportunities

in Data Science & AI



In-Demand Career Paths

- Data Scientist
- Machine Learning Engineer
- Data Analyst
- Deep Learning / NLP Engineer
- Generative AI Developer



Career Growth

Start as a junior data scientist or analyst and grow into roles like:

- Senior Data Scientist
- Machine Learning Lead
- AI Specialist
- Data Science Manager



Entrepreneurial Opportunities

- Build AI-based products
- Launch data-driven startups
- Offer analytics and AI services



Opportunities Across Industries

- Finance & banking
- Healthcare & biotech
- Retail & e-commerce
- Marketing & advertising
- Technology & software
- Government & public sector



Freelancing & Remote Work

Many companies offer remote roles and freelance projects, giving flexibility and global exposure.

Why choose a career in data science and AI?

- Organisations rely on data to make decisions, so these skills are valued across industries.
- Generative AI is creating new roles for people who can build applications with LLMs.

Career progression depends on each person's skills, experience and the roles available.

Learning Path

Data Science & AI

1

Data Science Foundations

Data, data quality, big data and Hadoop

2

Python, NumPy & Pandas

Programming and data analysis

3

Functions, OOP & Statistics

Reusable code, sampling and hypothesis testing

4

Machine Learning

Clustering, classification, regression, SVM, time series

5

ML Project

Feature selection, ensembles and model tuning

6

Deep Learning

Neural networks and CNNs

7

RNNs & TensorFlow

LSTMs, autoencoders, TensorFlow and Keras

8

Generative AI

LLMs, prompts, RAG and AI agents

9

Real-Time Project & Placement

Project, resume and interview preparation

Program Outcomes

At the end of this program, you will be able to:

- ✓ **Analyse data** with Python, NumPy and Pandas.
- ✓ **Apply statistics** to test hypotheses and understand data.
- ✓ **Build machine learning models** for classification, regression, clustering and recommendations.
- ✓ **Tune and compare models** with cross-validation, ensembles and GridSearchCV.
- ✓ **Forecast** with time series models.
- ✓ **Train neural networks**, CNNs and RNNs with TensorFlow and Keras.
- ✓ **Build generative AI applications** with LLMs, RAG, AI agents, LangChain and LlamaIndex.
- ✓ **Build a portfolio** from case studies, a real-time project and a GenAI capstone.
- ✓ **Prepare for interviews** for data science and AI roles.



Who Should Attend

This program suits anyone who wants to build or advance their skills in **data science and AI**:

- ✓ **Fresh graduates** who want to start a career in **data science and AI**.
- ✓ **Professionals** from non-technical backgrounds who want to **move into** data and AI roles.
- ✓ **Software developers** who want to add **machine learning and generative AI** skills.
- ✓ **Data and business analysts** who want to build predictive models.
- ✓ **Working professionals** who want to use data and AI to make better decisions.
- ✓ Anyone curious about **data**, problem-solving and **AI**.

No prior programming experience is required: Python is taught from the basics.

Program Curriculum

Nine modules take you from Python and statistics through machine learning and deep learning to generative AI, with case studies throughout and a real-time project at the end.

MODULE 01

Introduction to Data Science, Data & Big Data

What data science is, how data is collected, stored and checked for quality, and how big data systems work.

Deep learning & AI	Deep learning as a revolution in AI; limitations of machine learning; advantages of deep learning over machine learning; real-life use cases; review of machine learning
Foundations	Need for data scientists; foundations of data science; business intelligence, data analysis, data mining and machine learning; analytics vs data science
Value chain	Types of analytics; analytics project lifecycle
Data	Basis of data categorisation; types of data; data collection types; forms and sources of data; data quality, changes and issues
Data architecture	What data architecture is and its components; OLTP vs OLAP; how data is stored
Big data	The 5 Vs of big data; big data architecture, technologies, challenges and requirements; distributed computing; Hadoop, the MapReduce framework and the Hadoop ecosystem
Data science deep dive	Data products; large-scale analysis cost vs storage; data science skills and use cases; project life cycle and stages
Data acquisition & preparation	Where to source data; evaluating input data; data formats, quantity and quality; resolution techniques; data transformation; file format conversions; anonymisation

PROGRAM CURRICULUM

MODULE 02

Python Programming with NumPy & Pandas

Python from the basics, then the libraries used every day for data analysis.

Getting started	Python overview; interpreted languages; advantages and disadvantages; pydoc; starting Python; interpreter PATH; running a Python script
Language basics	Variables; keywords; built-in functions; strings and literals; math operators and expressions; writing to the screen; string formatting
Flow control	Command-line parameters and flow control
Sequences	Lists and tuples; indexing and slicing; iterating through a sequence; functions, operators and keywords for sequences; the range() function
Comprehensions & collections	List comprehensions; generator expressions; dictionaries and sets
NumPy	Learning NumPy arrays and operations
Pandas	Creating DataFrames; grouping and sorting; plotting data; creating functions; slicing and dicing operations

MODULE 03

Python Functions, OOP & Statistics

Write reusable Python and learn the statistics behind every model.

Functions	Function parameters; global variables; variable scope and returning values; sorting with alternate keys; lambda functions; sorting collections of collections
Classes & OOP	Classes, objects and object-oriented programming in Python
Descriptive statistics	Central tendency measures; the story of the average; dispersion measures; data distributions; central limit theorem
Sampling	What sampling is; why we sample; sampling methods
Inferential statistics	Hypothesis testing; confidence level; degrees of freedom; p-value; chi-square test; ANOVA
Correlation & regression	Correlation vs regression and their uses

PROGRAM CURRICULUM

MODULE 04 **Machine Learning with Python**

Supervised and unsupervised learning algorithms, each taught with a case study.

ML fundamentals	Common use cases; supervised and unsupervised learning techniques
Clustering	Similarity metrics; Euclidean and cosine distance; creating predictive models; K-Means clustering; TF-IDF, cosine similarity and the vector space model; case study
Association rules	Association rules and use cases; how recommendation engines work; recommendation use case; case study
Decision trees	Classification and its use cases; decision tree induction; building a decision tree; confusion matrix; case study
Random forest	Features of random forests; out-of-bag error estimate; variable importance; case study
Naive Bayes	Naive Bayes classifier; case study
Project discussion	Problem statement and analysis; approaches to a data science problem; pros and cons of different algorithms
Linear regression	Predictive modelling; simple and multiple linear regression; case study
Logistic regression	Data partitioning; univariate, bivariate and multicollinearity analysis; model building and validation; AUC and ROC curves; scorecards; case study
Support vector machines	Vectors; decision surfaces; linear SVMs; the kernel trick; non-linear and kernel SVMs; case study
Time series analysis	Time series data, variables and components; formatting and visualising time series; decomposition plots; ARIMA and exponential smoothing (ETS) models; forecasting for a given period; case study

PROGRAM CURRICULUM

MODULE 05

Machine Learning Project: Features, Ensembles & Tuning

Take models from working to well-tuned on an end-to-end project.

Algorithms in Python	Applying different machine learning algorithms in Python
Feature selection	Selecting the right data; choosing the best features; additional feature selection techniques; feature selection case study
Preprocessing	Preprocessing and scaling techniques; how to preprocess and scale your data; feature scaling project
Ensembles	Bagged decision trees; random forest; AdaBoost; stochastic gradient boosting
Model selection & tuning	Cross-validation scores; parameter tuning with GridSearchCV and a second tuning method; automating machine learning; comparing algorithms in practice
Text mining & NLP	Sentiment analysis; case study

MODULE 06

Deep Learning & Neural Networks

How neural networks learn, and how to build them for classification and images.

Deep learning overview	The brain vs the neuron; introduction to deep learning; case study
Artificial neural networks	Activation functions; how ANNs work and learn; gradient descent and stochastic gradient descent; backpropagation
Multi-layer perceptrons	Limitations of a single perceptron; multi-layer perceptron; forward and backward pass; variants of gradient descent; MLP digit classifier with TensorFlow
Deep networks	Why deep networks give better accuracy; how deep networks work; use-case implementation
Convolutional neural networks	Convolution operation; ReLU layers; pooling and flattening; full connection; softmax and cross-entropy; building a CNN for image classification

PROGRAM CURRICULUM

MODULE 07 RNNs, Autoencoders, TensorFlow & Keras

Sequence models, unsupervised deep learning and the frameworks used to build them.

Recurrent neural networks	Introduction to RNNs; understanding LSTMs; LSTM networks in Python
RBM & autoencoders	Restricted Boltzmann machines and their applications; understanding autoencoders; building an autoencoder model
TensorFlow basics	Why TensorFlow; TensorFlow as an interface and an environment; tensors and data types; computation graphs; installing TensorFlow; preparing data; loss and optimisation; running TensorFlow programs
Neural networks in TensorFlow	CPU vs GPU vs TPU; neural network architecture and layers; linear regression revisited; the MNIST dataset; coding an MNIST network
Deep learning in TensorFlow	Images and pixels; ConvNet architecture; overfitting and regularisation; max pooling and ReLU; dropout; strides and zero padding; debugging; visualising with TensorBoard
Transfer learning	Google Inception model; retraining Inception with your own data; predicting new images; Keras and TFLearn compared

PROGRAM CURRICULUM

MODULE 08

Generative AI Program

Large language models, prompt engineering, RAG and AI agents, from concepts to working applications.

PART 1: FOUNDATIONS

Introduction to Generative AI	What generative AI is; history and evolution of AI; traditional AI vs generative AI; real-world applications
AI & ML fundamentals	AI, machine learning and deep learning; neural networks; supervised, unsupervised and reinforcement learning; training data and model evaluation
Large language models	Transformer architecture and attention; tokens, embeddings and context windows; training, fine-tuning and inference
Prompt engineering	Prompt design; zero-shot and few-shot prompting; chain-of-thought concepts; role-based prompting and structured outputs; prompt optimisation and evaluation
Generative AI models & tools	Text, image, audio, speech and video generation; introduction to ChatGPT, Gemini, Claude and image-generation tools

PART 2: ADVANCED CONCEPTS & PRACTICAL APPLICATIONS

Retrieval-augmented generation	RAG architecture; document processing and chunking; embeddings and vector databases; semantic search; building a document-based chatbot
AI agents & automation	Tools, functions and API integration; agent workflows and planning; multi-agent systems; AI-powered task automation
GenAI application development	Python for generative AI; working with LLM APIs; LangChain and LlamaIndex; building AI applications and chatbots; deployment fundamentals
Responsible AI & security	Hallucinations and bias; data privacy; copyright and ethics; prompt injection; responsible AI practices and governance
Hands-on GenAI projects	AI chatbot; document Q&A with RAG; AI content and image generation; workflow automation with AI agents; final capstone and presentation

PROGRAM CURRICULUM

MODULE 09 **Real-Time Project**

Apply everything you have learned in task-based, real-time work:

Real-time project	Task-based learning on a real-time data science project, from data preparation to model building and presentation.
Generative AI capstone	Build and present a generative AI application, such as a RAG chatbot or an agent-based automation.
Resume preparation	Turn your projects into a data science resume and portfolio.

OUTCOMES **Course Outcomes**

By the end of this program, you will be able to:

- ✓ Explain the data science lifecycle, data quality and big data concepts
 - ✓ Apply descriptive and inferential statistics
 - ✓ Forecast with time series models such as ARIMA and ETS
 - ✓ Use LLMs and prompt engineering effectively
 - ✓ Apply responsible AI and application security practices
- ✓ Program in Python and analyse data with NumPy and Pandas
 - ✓ Build, evaluate and tune machine learning models
 - ✓ Build neural networks, CNNs and RNNs with TensorFlow and Keras
 - ✓ Build RAG chatbots and AI agents with LangChain and LlamaIndex
 - ✓ Present a real-time project and a generative AI capstone

Tools & Technologies Covered

Programming & Data Analysis

Python

NumPy

Pandas

Matplotlib

Machine Learning

scikit-learn

GridSearchCV

ARIMA & ETS

Deep Learning

TensorFlow

Keras

TFLearn

TensorBoard

Generative AI

ChatGPT

Gemini

Claude

LLM APIs

LangChain

LlamaIndex

Vector databases

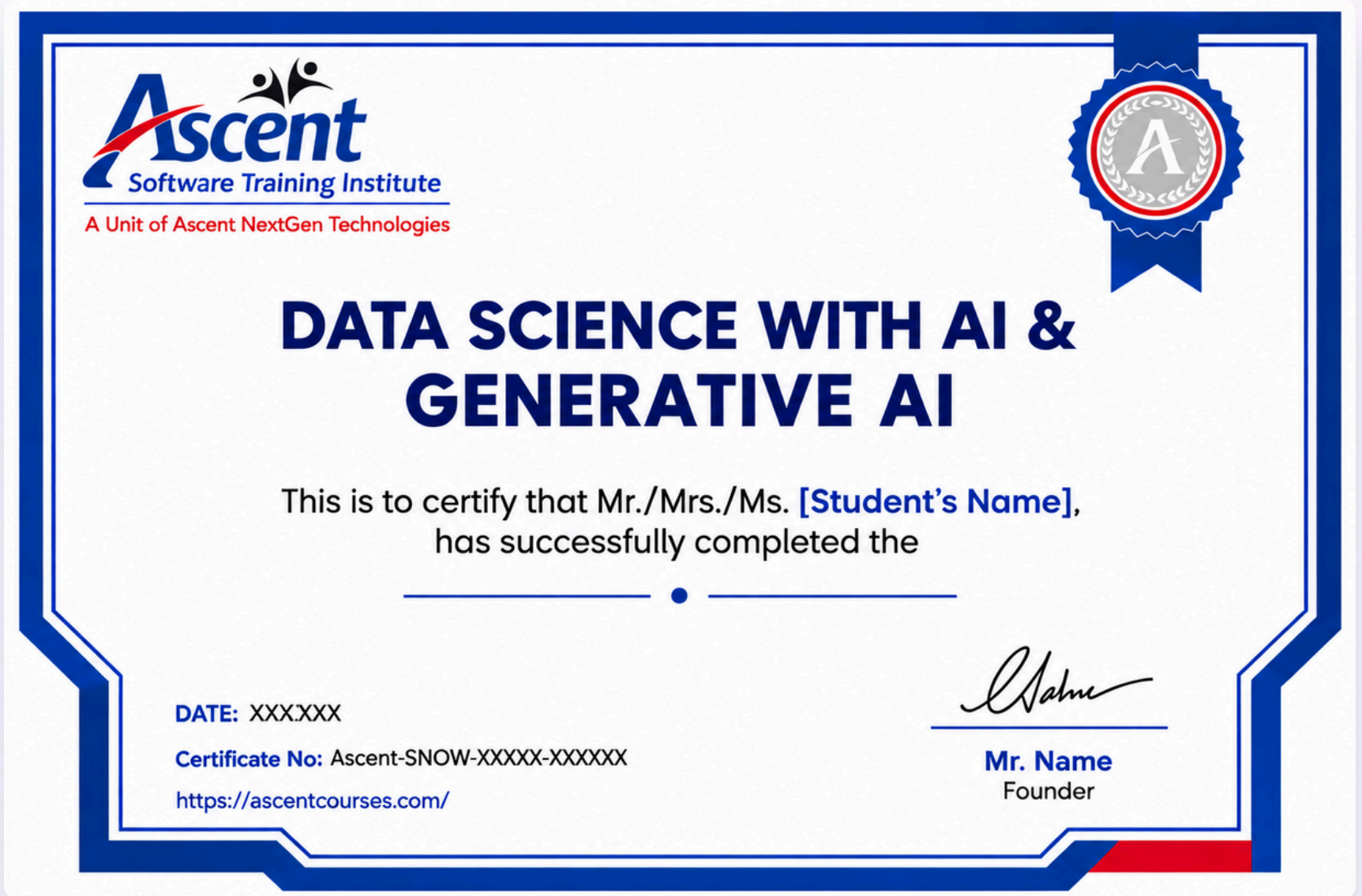
Big Data (introduction)

Hadoop

MapReduce

Tool names are used to describe the training content only.

Certification



On successful completion of the program, you receive the **Data Science with AI & Generative AI** certificate from Ascent Software Training Institute.

Placement Assistance Program



Resume Building

Resumes tailored to data science, ML and AI roles.



Career Counselling

Personalised career guidance and a roadmap for your job search.



Job Alerts

Regular alerts for the latest openings.



Job Referrals

Referrals to companies through our hiring network.



Mock Interviews

Real interview scenarios with expert feedback.



Interview Preparation

Common questions and how to answer them in technical interviews.



Soft Skills Training

Communication, teamwork and presentation skills.



Placement Support

Guidance through the hiring process.

Placement assistance supports your job search. Final hiring decisions are made by employers, based on each candidate's skills and interview performance.

Student Reviews



Rahul Sharma

Data Science & AI

I'm truly thankful to the dedicated faculty at Ascent for their outstanding training in Data Science and AI. The well-structured sessions, hands-on projects and continuous guidance helped me build strong analytical and problem-solving skills. Their support boosted my confidence to work on real-time industry scenarios. Heartfelt thanks!



Amit Kumar

Data Science & AI

Ascent provided me with the perfect platform to learn Data Science and AI from scratch. The hands-on training, real-world examples and mentorship helped me improve my technical skills significantly. I'm really grateful for the continuous guidance and support.

Feedback from Data Science students, as published by Ascent Software Training Institute.

Talk to an Admission Counsellor

We have a dedicated team to counsel and guide you to choose the right course for your career goals. Book a free demo class, in the classroom or online.



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HOURS

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