

# DATA SCIENCE WITH GENERATIVE AI

Data Science with Generative AI is an advanced program designed to help students master Data Analysis, Machine Learning, Artificial Intelligence, and modern Generative AI technologies. This course combines traditional Data Science concepts with powerful AI tools like GPT, LLMs, and AI automation frameworks to build intelligent real-world applications.

Students will learn how to analyze data, create predictive models, automate workflows, generate AI-powered insights, and build smart applications using Python and modern AI technologies.

This program is suitable for students, freshers, working professionals, and anyone looking to build a successful career in Data Science, Artificial Intelligence, and Automation.

## What You Will Learn

- Python Programming Fundamentals
- Data Analysis & Data Cleaning
- Data Visualization Techniques
- Statistics & Mathematics for Data Science
- Machine Learning Algorithms
- Deep Learning Concepts
- Generative AI & Large Language Models
- Prompt Engineering
- AI-Powered Automation
- Real-Time Project Development
- Deployment & Model Integration

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# Course Syllabus

## Module 1: Python Programming

- Python Basics
- Variables & Data Types
- Conditional Statements
- Loops & Functions
- File Handling
- Object-Oriented Programming
- Exception Handling
- Python Libraries Introduction

## Module 2: Data Analysis with Python

- NumPy Fundamentals
- Pandas for Data Manipulation
- Data Cleaning Techniques
- Data Transformation
- Handling Missing Values
- Working with CSV & Excel Files
- Exploratory Data Analysis (EDA)

## Module 3: Data Visualization

- Matplotlib Basics
- Seaborn Visualization
- Charts & Graphs
- Statistical Visualization
- Dashboard Concepts
- Data Reporting Techniques

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## Module 4: Statistics for Data Science

- Descriptive Statistics
- Probability Concepts
- Mean, Median & Mode
- Standard Deviation & Variance
- Hypothesis Testing
- Correlation & Regression

## Module 5: Machine Learning

- Introduction to Machine Learning
- Supervised Learning
- Unsupervised Learning
- Regression Algorithms
- Classification Algorithms
- Clustering Techniques
- Model Evaluation
- Feature Engineering

## Module 6: Deep Learning

- Neural Networks Basics
- Artificial Neural Networks (ANN)
- CNN Introduction
- RNN Introduction
- TensorFlow Basics
- PyTorch Fundamentals

## Module 7: Generative AI

- Introduction to Generative AI
- Understanding LLMs
- OpenAI & GPT Models
- Prompt Engineering
- AI Content Generation
- AI Chatbot Development
- Text Generation Techniques
- AI Automation Workflows

## Module 8: Hugging Face & LangChain

- Hugging Face Transformers
- Pre-trained Models
- Tokenization Concepts
- LangChain Basics
- AI Application Integration
- Building AI Pipelines

## Module 9: Real-Time Projects

- AI Chatbot Project
- Data Analysis Project
- Machine Learning Prediction System
- Generative AI Automation Project
- Dashboard Development

## Tools & Technologies Covered

- Python
- NumPy
- Pandas
- Matplotlib
- Seaborn
- Scikit-Learn
- TensorFlow
- PyTorch
- OpenAI APIs
- Hugging Face
- LangChain
- Jupyter Notebook
- Power BI / Tableau

