

AI & ML Course Syllabus

<u>Introduction to AI & ML</u>	<u>Mathematics for AI</u>
<ul style="list-style-type: none"> • What is AI, ML, Deep Learning • History & evolution • Types of AI (Narrow, General, Super AI) • Real-world applications • AI vs ML vs Data Science 	<ul style="list-style-type: none"> • Linear Algebra (vectors, matrices, eigenvalues) • Probability: • Conditional probability • Bayes theorem • Statistics: • Mean, median, variance • Calculus: • Derivatives • Gradient descent basics
<u>SQL for AI & ML</u>	<u>Deep Learning</u>
<ul style="list-style-type: none"> • Database Fundamentals • SQL Queries (SELECT, WHERE, ORDER BY) • Joins (Inner, Left, Right) • Aggregate Functions • Subqueries & Views • Real-world dataset practice 	<ul style="list-style-type: none"> • Neural Networks (ANN) • Activation functions • Backpropagation • Frameworks: • TensorFlow • PyTorch
<u>Python Programming</u>	<u>Data Handling & Preprocessing</u>
<ul style="list-style-type: none"> • Python basics (variables, loops, functions) • OOP concepts • File handling • Libraries: • NumPy • Pandas • Matplotlib • Seaborn 	<ul style="list-style-type: none"> • Data collection & datasets • Handling missing values • Data cleaning • Feature engineering • Encoding & scaling
<u>Machine Learning Fundamentals</u>	<u>Natural Language Processing (NLP)</u>
<ul style="list-style-type: none"> • Supervised learning • Unsupervised learning • Reinforcement learning • Model training & evaluation • Overfitting & underfitting 	<ul style="list-style-type: none"> • Text preprocessing • Tokenization • Sentiment Analysis • Language Models (e.g., BERT)

Website: www.nextgenindore.com

Contact Number: +919752683018, +917898460275

Address: Scheme No 78 Main Road 1st Floor, Front of Union Bank,
Nearby Utsah Restaurant & Mahindra Showroom, Indore, Madhya Pradesh 452010, INDIA

NEXTGEN

Computer Institute

<u>Supervised Learning Algorithms</u>	<u>Unsupervised Learning</u>
<ul style="list-style-type: none"> • Linear Regression • Logistic Regression • Decision Tree • Random Forest • Support Vector Machine (SVM) • K-Nearest Neighbors (KNN) 	<ul style="list-style-type: none"> • K-Means Clustering • Hierarchical Clustering • PCA (Dimensionality Reduction)
<u>JOB ROLES AFTER COURSE</u>	<u>Ethics & Future of AI</u>
<ul style="list-style-type: none"> • AI Engineer • ML Engineer • Data Scientist • NLP Engineer • Computer Vision Engineer 	<ul style="list-style-type: none"> • Bias in AI • Data privacy • AI safety • Future trends
<u>Projects</u>	<u>TOOLS</u>
<ul style="list-style-type: none"> • Data Cleaning Projects • Data Visualization Projects • Data Engineering / ETL Projects 	<ul style="list-style-type: none"> • Python, SQL • Jupyter Notebook • Google Colab • Git & GitHub
<u>Basics of Generative AI</u>	
<ul style="list-style-type: none"> • AI vs ML vs Deep Learning • Introduction to LLMs • Transformers Basics • Hugging Face Transformers Basics 	

Website: www.nextgenindore.com

Contact Number: +919752683018, +917898460275

Address: Scheme No 78 Main Road 1st Floor, Front of Union Bank,
Nearby Utsah Restaurant & Mahindra Showroom, Indore, Madhya Pradesh 452010, INDIA