AI & DATA SCIENCE
TRAINING SYLLABUS

HI-TECH INSTITUTION

Hi-tech Institution is a trusted IT training institution established in 2017, dedicated to transforming careers through industry-relevant, real-time project-based learning. With a strong presence in Pondicherry, Thiruchitrambalam, and Chennai, we specialize in creating future-ready professionals.

EXPERT FACULTY

At Hi-Tech Institution, training is not handled by traditional lecturers — it's delivered by real-time industry experts. Our faculty are seasoned professionals with 10+ years of hands-on experience in Artificial Intelligence, Machine Learning, Data Science, and large-scale project delivery.

OUR VISION

Our vision is to bridge the gap between traditional learning and industry needs. Our mission is simple: to empower individuals with hands-on skills, globally recognized certifications, and the confidence to excel in the IT world.

WHAT LEANERS SAY

Our students not only succeed— they return. Many alumni re-enroll for additional courses and refer friends, a testament to our quality, trainer expertise, and hands-on approach.

CORPARATE TRUST US

We've successfully partnered with IBM and other forward-thinking organizations to deliver impactful team training. With over 200 batches completed, our track record is built on results, retention, and referrals.

WHO WE SERVE

- **Fresh Graduates –** Gain practical, job-ready skills and enter the IT workforce with confidence.

- **Career Switchers –** Move from non-IT to IT through structured, mentor-led training.

- **Working Professionals –** Upgrade your skillset, achieve promotions, and switch to high-demand roles.

- **Corporate Teams –** Custom programs designed to upskill entire teams for upcoming projects.

- **Final-Year Students –** Strengthen your resume with internships, projects, and certifications before graduation.

- **Non-Technical Backgrounds –** Step-by-step guidance to transition into IT even without coding experience.

- **Job Seekers –** Resume, interview prep, and portfolio building for faster placements.

JOB READY SKILL

Learn in months what usually takes years! With real-time projects and practical training in Python, Machine Learning, Deep Learning, and Data-Science, you'll be job-ready and confident to contribute from Day 1.

400+
BATCH TRAININGS SUCCESSFULLY COMPLETED

9000+
PROFESSIONALS SUCCESSFULLY TRAINED

01 INTERACTIVE LIVE TRAINING

100% live sessions with real-time Q&A and doubt-solving. Engaging, interactive, and never boring like recorded videos.

02 DAILY HANDS-ON LABS

Every topic comes with guided labs and tasks so you learn by doing, not just watching.

03 ONE-TO-ONE DOUBT SOLVING

Struggling with a concept? Get personal 1:1 mentoring to clear doubts quickly.

04 MENTOR SUPPORT BEYOND CLASS

Get lifetime trainer guidance and alumni group access for continuous support.

05 FLEXIBLE LEARNING

Morning, evening, and weekend batches to fit your schedule.

DOMAIN EXPERTISE

A Journey of Innovation and Success

CAREER GROWTH IN THIS DOMAIN

A career in AI & Data Science offers high salaries and global opportunities — with Data Scientists earning ₹8–20 LPA and AI Engineers ₹12–25 LPA+, driven by the rising demand for data-driven decision-making and intelligent automation across industries worldwide.

OUR SPECIALIZATION

Unlike generic IT courses, we focus on AI and Data Science mastery. Our training dives deep into data analysis, machine learning, deep learning, and model deployment. Every session bridges theory with practice — so you don't just learn concepts, you apply them to real-world datasets and industry problems just like top companies do.

INDUSTRY-RELEVANT CURRICULUM

- Designed with corporate inputs
- Updated every quarter Covers
- End-to-end AI & Data Science lifecycle

CERTIFICATION SUPPORT

We provide complete support to help you crack top certifications like AI-900 (Azure AI Fundamentals), AWS Machine Learning Specialty, and TensorFlow Developer — with practice exams, expert guidance, and step-by-step mentorship for success.

INTERNSHIP

Learning without practice is incomplete. That's why we provide internships with real AI projects and advanced problem-solving in data science. Every student builds real solutions and earns an internship certificate that adds strong value to resumes and interviews.

PORTFOLIO BUILDING

Learning without practice is incomplete. That's why we offer internships with real AI applications and hands-on data science challenges. Students build practical solutions and earn certificates that boost resumes and interview success.

PRACTICAL-FIRST APPROACH

From Day 1, you'll learn by doing through labs, tasks, and real-world projects — gaining hands-on confidence to apply skills instantly.

Table of **Contents**

Programming, Data Handling & Visualization

Python Foundations

- Variables, data types, operators
- Control flow: if-else, loops, recursion
- Functions, lambda, exception handling
- File handling (CSV, JSON, text)
- Jupyter Notebook, Markdown

NumPy – Numerical Computing

- Arrays, indexing, slicing
- Broadcasting, reshaping, stacking
- Matrix operations, dot product
- Mathematical & statistical functions
- Use-cases in image & numeric data

Pandas – Data Handling

- Series, DataFrames
- Import/export (CSV, Excel, SQL, JSON)
- Indexing, filtering, grouping, merging
- Handling categorical, datetime, text data
- Multi-indexing and pivot tables

Data Cleaning & Preprocessing

- Missing value treatment (mean, median, KNN)
- Outlier detection (IQR, Z-score)
- Type conversions, normalization, scaling
- Encoding categorical features
- Preparing raw data for ML

Data Visualization

- Matplotlib: line, bar, scatter, pie, histogram
- Seaborn: heatmap, violin, pair plots
- Plot customization & aesthetics
- EDA workflow (Titanic dataset)

Statistics, Mathematics & Databases Statistics

- Mean, median, mode
- Variance, std. deviation, IQR
- Probability basics, Bayes' theorem
- Distributions: normal, Poisson, binomial
- Hypothesis testing: t-test, chi-square, ANOVA
- Confidence intervals, p-values

Linear Algebra & Math

- Scalars, vectors, matrices, tensors
- Matrix ops: add, multiply, transpose
- Determinant, eigenvalues, eigenvectors
- Factorization: LU, QR, SVD
- Applications in PCA & recommender systems

SQL Basics

- SELECT, WHERE, ORDER BY, DISTINCT
- Aggregates: COUNT, SUM, AVG
- Filtering with LIKE, IN, BETWEEN
- Joins: INNER, LEFT, RIGHT, FULL OUTER
- Subqueries, nested queries

SQL Advanced

- Window functions: RANK, ROW_NUMBER
- Case studies: sales analytics, customer insights
- Mini project: Loan approval prediction

Machine Learning & Evaluation

ML Foundations

- ML workflow & terminology
- Linear regression, multiple regression
- Logistic regression: binary, multiclass
- k-Nearest Neighbors (kNN)
- Supervised vs. unsupervised

Tree-Based Models & Ensembles

- Decision Trees: Gini, entropy
- Random Forests: bagging, feature importance
- Gradient Boosting: AdaBoost, XGBoost basics
- Support Vector Machines (linear, kernel)
- Naive Bayes: Gaussian, multinomial

Clustering & Dimensionality Reduction

- K-Means: elbow method, silhouette score
- Hierarchical clustering, dendrograms
- DBSCAN for density-based clustering
- PCA: dimensionality reduction, variance explained
- Applications in segmentation & anomaly detection

Model Evaluation & Optimization

- Metrics: accuracy, precision, recall, F1, AUC
- Confusion matrix, ROC curve
- Overfitting & regularization (L1, L2)
- Cross-validation (k-fold, stratified)
- Hyperparameter tuning (GridSearch, RandomSearch)
- Mini projects: Churn prediction, Loan prediction

Advanced AI, Deep Learning & Capstone

Neural Networks Basics

- Perceptron, multilayer networks
- Activation functions: ReLU, Sigmoid, Softmax
- Backpropagation & gradient descent
- Regularization: dropout, batch norm
- Frameworks: TensorFlow, Keras, PyTorch

Deep Learning Architectures

- CNN: filters, pooling, feature maps
- Applications: image recognition, object detection
- RNN: sequential data, vanishing gradient
- LSTM & GRU for time series & text
- Mini projects: MNIST, Text Generation

Big Data & Pipelines

- Hadoop & Spark overview
- PySpark: RDDs, DataFrames, SQL queries
- MLlib basics for large-scale ML
- Airflow basics: DAGs, ETL workflows
- Cloud AI platforms (AWS, Azure, GCP)
- MLOps intro: deployment with FastAPI

NLP & AI Ethics

- Tokenization, stemming, lemmatization
- Bag of Words, TF-IDF, Word2Vec, GloVe
- Transformers: Attention, BERT, GPT
- Applications: chatbots, sentiment analysis, fake news detection
- Ethics: bias, fairness, accountability

WHAT OUR STUDENTS SAY

We believe results speak louder than promises — and our students' reviews are proof of the trust and transformation we deliver every batch.

K Kirubagaran .D
5 reviews
★★★★☆ 8 months ago

I joined this institute to take training for AWS & Devops. My all over experience is very good 💪. The knowledge given by the sir is very helpful to me 🏛️. Thank you.

Harish Kumar
4 reviews
★★★☆☆ 8 months ago

While I joining this institute, I have less knowledge in aws and devops , after the guidance and good teaching by the Mathesh sir I have gained more knowledge. Thank you for your guidance and Teaching.

h harshavardhana
2 reviews
★★★★★ 11 months ago

I recently completed an AWS and DevOps course at Hi-Tech institution, and I couldn't be more satisfied with the experience. The course was incredibly well-structured, covering both fundamental and advanced concepts in a way that was easy to follow yet challenging enough to push my learning boundaries.

Sridhar sri
1 review
★★★★☆ 5 months ago

"Well-organized AWS and DevOps training with experienced mentors. A great place to build practical skills!"

♡ ❤ 3 ↗

B Bhuvanesh.V
2 reviews
★★★★★ 5 months ago

Good learning environment! The AWS and DevOps sessions were clear, practical, and highly beneficial for beginners.

♡ ❤ 2 ↗

A K A S H
2 reviews
★★★★★ 5 months ago

Excellent training on AWS and DevOps! The mentors were knowledgeable, and the sessions were very insightful. Highly recommended!

♡ ❤ 3 ↗

S Sanjeevi Kumar
1 review
★★★★☆ 3 months ago

I recently completed the AWS DevOps course at HiTech and I'm extremely satisfied with the experience. The trainers were knowledgeable and provided excellent support throughout the course. The hands-on labs and real-world examples helped me gain practical skills and confidence in using AWS services.

Kamal Raj
1 review · 1 photo
★★★★★ 11 months ago

Beyond the classroom, the Hi-Tech Institution center offers excellent support for AWS & Devops The availability of additional resources, such extra practice sessions, is incredibly beneficial. The staff is always approachable and ready to assist with any queries or challenges.

A Anuj Jena
3 reviews
★★★★★ 7 months ago

I have attend AWS batch (Batch Number - B184 & Timing - 7:00 AM - 9:00 AM (Weekend)) & it was my good luck to had Hari as my batch instructor. Hari has tremendous knowledge on AWS & DevOps. I learnt lot of new topics related to AWS & DevOps. I want to highlight some point here according to my experience.

Sathyaswarubini Kannan
4 reviews
★★★★★ 7 months ago

I am Sathyaswarubini from Batch -B184, honestly speaking that Hari is a perfect instructor for AWS DevOps session. I am completely impressed with his Youtube videos and coaching. Every session started on time with clear note of him. I spent a great period of time on his sessions and got some confident level to attend the interviews in future. Thank you hari.

Naveen Kumar
1 review
★★★★★ 5 months ago

Had a great experience learning AWS and DevOps at Hi-Tech Institution. The structured training and expert guidance made it worthwhile

♡ ❤ 2 ↗

D D.Chandru
1 review
★★★★★ 2 weeks ago [NEW]

I had the opportunity to learn AWS Cloud Computing at HTGE Technologies Pvt Ltd for one month, and it was an excellent experience. The training was well-structured, covering both fundamental concepts and practical applications of AWS services. The instructors were knowledgeable, supportive, and always ready to clarify doubts with real-world exampes. which helped me gain confidence in working with cloud tools. The learning environment was friendly, interactive, and career-focused.

v vindhiya e
1 review
★★★★★ 4 days ago [NEW]

I recently completed a one-month Cloud Computing internship at HTGE Technologies Pvt Ltd. It was a great learning experience where I got to work with real cloud platforms like AWS . The team was supportive, and the work environment made it easy to grow and ask questions. I learned a lot in a short time and truly appreciated the hands-on exposure. Highly recommend HTGE for anyone looking to build practical skills in tech.

Check out what our students are saying about us on Google :
https://share.google/hm4sQdfCGAIA3CYHN

Your Future in AI & DS Starts Here

You've explored the course, the curriculum, the career scope, and the success stories. Now comes the most important step — taking action to build your career.

At HTGE Technologies, we are not just another training institute. We are a career-launchpad trusted by 200+ batches and corporate clients like IBM. Our mission is simple: to bridge the gap between learning and real-world application.

MEDIA MENTIONS

Youtube : https://www.youtube.com/@hitechinstitution

LinkedIn : https://www.youtube.com/@hitechinstitution

Instagram : https://www.instagram.com/hitech.institution

Website : www.hitechinstitution.com

COURSE DETAILS

Duration: 3 Months + Internship

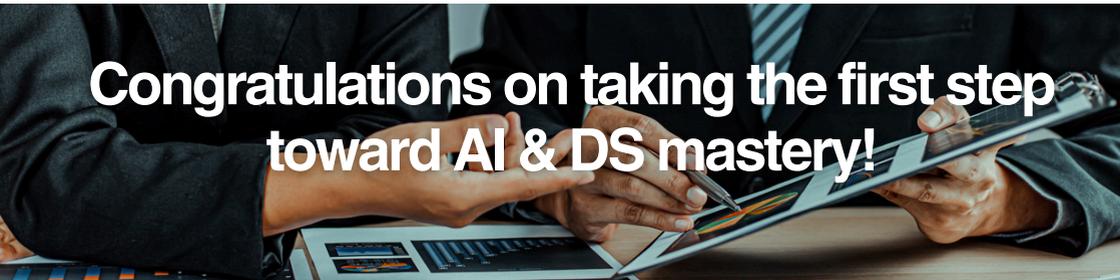**Mode :** In-Person & On-Line

Language : Tamil & English

Mode of Training: Live Online Sessions (with recordings)

Eligibility: Freshers, Working Professionals, Final-Year Students, Career Switchers

READY TO TAKE THE NEXT STEP

Visit: hitechinstitution.com

Call / WhatsApp: +91 7092909192 | +91 7200117161

Congratulations on taking the first step toward AI & DS mastery!