



**ICT  
ACADEMY  
OF KERALA**



**INDUSTRY READINESS PROGRAM  
CERTIFIED SPECIALIST IN  
DATA SCIENCE & ANALYTICS**



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## About the Program

The Certified Specialist in Data Science & Analytics program offers comprehensive technology training that is directly applicable to various industries. By participating in this program, learners gain essential skills necessary to excel in IT or business organizations (such as Information Technology, Banking, Financial Services, and Retail) that heavily rely on advanced technologies. Additionally, with its focus on physical sessions, participants benefit from hands-on experience and interactive learning opportunities, further enhancing their capabilities and readiness for real-world challenges.








**OFFLINE**  
**3 Months**  
(375 Hrs.)



**INTERNSHIP DURATION**  
**125 Hrs.**  
(With Mentor Support)



**ONLINE**  
**6 Months**  
(375 Hrs.)

-  **Online and Offline sessions tailored for graduates and professionals**
-  **Scholarships and cashbacks for meritorious candidates via ICTAK**
-  **Three to six-month access to LinkedIn Learning included**
-  **Comprehensive employability skills training offered**
-  **100% placement assistance guarantee for the eligible candidates**



The ICT Academy of Kerala (ICTAK) offers hands-on training sessions aimed at bridging the skill gap in the information and communication technology (ICT) domain. These online or offline sessions provide job-oriented courses in information technology (IT), furnishing participants with the essential skills and certifications required for various IT job roles. This proactive approach has proven instrumental in assisting numerous individuals in securing employment within the ICT sector.

## Job Roles

Candidates participating in this program can anticipate a wide range of potential career paths upon completion.

Data Analyst



Business Intelligence Analyst



Data Scientist



Data Engineer



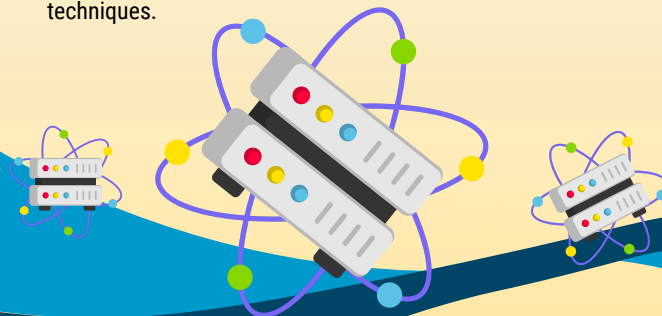
## Learning Outcome

Upon completion of the program, participants will be equipped with:

- **Comprehensive Data Science Knowledge:** Solid foundation in data science concepts, including machine learning, cloud computing, and big data technologies.
- **Practical Skills:** Proficiency in Python, SQL, Tableau, and Flask, enabling effective data manipulation, analysis, visualization, and model deployment.
- **Critical Thinking and Problem-solving:** Enhanced ability to think critically and creatively, solve complex problems, and make data-driven decisions.
- **Career Readiness:** Preparedness to enter the data science field with a competitive edge, capable of handling real-world challenges and contributing to various domains using data science techniques.

## Agenda

- Introduction to Data Science
- Basics of Python Programming and Python for Data Science
- Data Visualization with Tableau
- Introduction to Statistics Classification, Tabulation, and Presentation of Data
- Measures of Central Tendency and Dispersion
- Simple Correlation and Regression
- Data Preparation and Data Preprocessing
- Clustering
- Text Mining & Analysis
- Testing of Hypothesis in Case of Large and Small Samples
- Chi-Square Test, F-Distribution, and Analysis of Variance (ANOVA)
- Probability and Data Science
- Database Concepts and SQL
- Web App Devt. with Python Flask





## About ICTAK



The ICT Academy of Kerala (ICTAK) is a not-for-profit organization formed by the Government of India, the Government of Kerala, and leading IT industry players like TCS, UST, IBS, and Quest Global. ICTAK offers various ICT and life skills programs such as Microsoft, Java, DevOps, Cyber Security, Artificial Intelligence/Machine Learning, and so on. Recognized by the Government of Kerala's Department of Electronics & IT, ICTAK provides comprehensive training with capstone projects and internships to prepare the next generation of ICT professionals. In the 2023-24 period, it expanded its partner network to 282 academic institutions, impacting over 12,000 students and 600 faculties. With 182 corporate partners, ICTAK organizes events, hackathons, and conferences to develop new ICT courses and promote digital literacy. Through partnerships with the government, it focuses on capacity building and project execution. Over the last decade, ICTAK has trained 1,20,000 participants and received national recognition for its innovative training practices from the Indian Society for Training & Development (ISTD).



**INFORMATION &  
COMMUNICATION TECHNOLOGY  
ACADEMY OF KERALA**  
**ICTAK**

## CERTIFIED SPECIALIST IN DATA SCIENCE & ANALYTICS

### Eligibility

- Engineering or science graduates / three-year diploma in any engineering branches, having a foundation level knowledge (plus two equivalent) in Mathematics and Computer fundamental skills.
- Students who have completed their graduation but are awaiting the final results can also apply.

*\*Please note that the ICT Academy of Kerala will have the right to cancel the candidature at any point if found ineligible.*



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## Appendix: Detailed Program Curriculum

Module	Duration
<b>Module 1 - Problem Solving and Design Thinking</b> <ul style="list-style-type: none"><li>Understanding the Problem, Analytical Thinking, Creativity and Innovation, Decision-Making Skills, Troubleshooting Skills, Logical Reasoning.</li><li>Design Thinking: Empathy, Defining the Problem, Ideation, Prototyping, Testing and Iterating, Case Studies.</li></ul>	<b>10 Hrs.</b>
<b>Module 2 - Introduction to Data Science</b> <ul style="list-style-type: none"><li>Introduction to Data Science, Applications of Data Science, Demystifying the Terms - Data Science, Data Analytics, Machine Learning, Artificial Intelligence, Deep Learning.</li><li>Types of Analysis - Descriptive, Diagnostic, Predictive &amp; Prescriptive.</li><li>Statistics-Measures of Central Tendency, Dispersion, P-Test, T-Test, Z-Test, F-Distribution, Matrix, Eigenvalue, Eigenvectors, Introduction, Conditional Probability, Bayesian Theorem.</li><li>Overview of Cloud Computing, Benefits of Cloud Computing, Types of Cloud Services (IaaS, PaaS, SaaS), Popular Cloud Service Providers (AWS, Azure, Google Cloud).</li></ul>	<b>45 Hrs.</b>
<b>Module 3 - Python Programming and Data Handling</b>	
<b>Unit 1</b> <ul style="list-style-type: none"><li>Install Python/anaconda, Introduction to Github , Introduction to Jupyter Notebook , Introduction to Numpy Library, Importing Numpy, Concept of Arrays, Arithmetic Operations Using Numpy, Introduction to Pandas, Importing Pandas, Concept of Series and Dataframes, Creating Series and Dataframes Using Lists and Dictionaries, Loading Different Files to Python Environment, Basic Pandas Operations (Head, Tail, Describe, Shape Etc.)</li></ul>	<b>45 Hrs.</b>
<b>Unit 2</b> <ul style="list-style-type: none"><li>Sql Basics, Crud Operations, Join, Group by,window Functions, Reading Data From Various Sources, Array, Dataframe, Vectors, Series, Introduction to Pyspark.</li></ul>	
<b>Module 4 - Data Visualisation and EDA</b>	
<b>Unit 1</b> <ul style="list-style-type: none"><li>Data Visualization Using Tableau, Introduction to Tableau, Advantages and Uses of Tableau, Connecting to Different Data Sources, Data Types in Tableau, Dimensions and Measures in Tableau, Different Visualizations in Tableau(Bar Chart, Scatter Charts, Line Charts, Maps), Creating Dashboards and Stories, Predictive Analytics Using Tableau.</li></ul>	<b>45 Hrs.</b>
<b>Unit 2</b> <ul style="list-style-type: none"><li>Introduction to Pre-processing, Handling Missing Values, Outlier Detection and Handling, Encoding Techniques, Scaling &amp; Normalization, Correlation, EDA - Visualizations Using Matplotlib , Seaborn Libraries.</li></ul>	



Module	Duration
<b>Module 5 - Supervised and Unsupervised Learning Algorithms</b> <b>Unit 1</b> <ul style="list-style-type: none"><li>Linear Regression, polynomial Regression, Regularization, logistic Regression, Naive Bayes, Knn, Svm, Decision Tree, Random Forest.</li></ul> <b>Unit 2</b> <ul style="list-style-type: none"><li>Introduction to Unsupervised learning, Introduction to clustering, k-Means algorithm, agglomerative hierarchical clustering algorithm, Dimensionality</li></ul>	<b>45 Hrs.</b>
<b>Module 6 - Deep Dive Into Cloud Computing</b> <ul style="list-style-type: none"><li>Cloud Deployment Models (Public, Private, Hybrid, Community Clouds) Benefits of Cloud Computing: Cost Savings, Scalability, Flexibility, Reliability, Security challenges and Risks: Security Concerns, Data Privacy, Compliance, Vendor Lock-in Cloud Providers: Overview of Major Cloud Providers (Aws, Azure, Google Cloud, Etc.)</li><li>Use Cases: Common Use Cases for Cloud Computing Across Industries Future Trends: Serverless Computing, Edge Computing, Ai/ml in Cloud Computing.</li></ul>	<b>45 Hrs.</b>
<b>Module 7 - Model Deployment Mlops</b> <b>Unit 1</b> <ul style="list-style-type: none"><li>Basic Html Structure, Html Elements and Tags, Text Formatting in Html, Links and Images, Lists and Tables, Forms and Input Elements.</li><li>Classes and Objects, Attributes, Methods, Inheritance, Encapsulation, Polymorphism, Special Methods (Dunder Methods), Class and Instance Variables, Access Modifiers, Decorators.</li><li>What is Flask, Setting Up a Flask Environment, Creating a Basic Flask Application, Routing in Flask, Rendering Templates, Request and Response Handling, Flask Extensions, Working With Forms, Flask and Databases, Flask and Authentication, Deploying Flask Applications.</li></ul> <b>Unit 2</b> <ul style="list-style-type: none"><li>Installation and Setup, Creating a Simple Web App, Loading the Machine Learning Model, Accepting User Inputs, Making Predictions, Displaying Results, Handling Errors, Adding Style and Interactivity, Deploying the Web App.</li><li>Introduction to Mlops, Key Concepts in Mlops, Mlops Lifecycle, Version Control for ML Models, Model Training and Evaluation Pipelines, Model Deployment Strategies.</li></ul>	<b>40 Hrs.</b>



Module	Duration
<b>Module 8 - Capstone Project</b> <ul style="list-style-type: none"><li>• Applying Knowledge and Skills Acquired Throughout the Program to Solve a Real-World Data Science Problem Using the Machine Learning Lifecycle.</li><li>• Project Planning, Data Collection, Data Preparation, Model Development, Model Evaluation, Model Deployment, Analysis and Presentation</li></ul>	<b>100 Hrs.</b>
<b>Total</b>	<b>375 Hrs.</b>