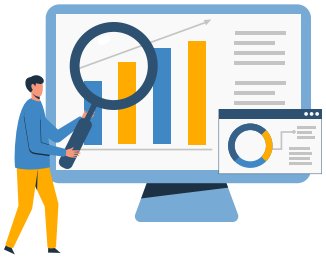
IDM TECHPARK

GUIDE`S FOR PERFECT CAREER PATHWAY

# Data Analytics Course Syllabus



N·S·D·C National Skill Development Corporation

CERTIFIED ISO 9001:2015 COMPANY

IDMTECHPARK
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# About Us

IDMTECHPARK global retail & corporate training solutions provider in Coimbatore, Erode, Trichy & Salem that offers a comprehensive range of training and placement services for both fresher's and professionals seeking new opportunities. The company commenced its IT training business in 2016. A pioneer in IT education, over the years, we have trained over 50k students. Idmtechpark has a wide range of courses, maintains education standards & provides placement assistance.



# About IDMTechpark Education Quality

IDMTECHPARK is managed and developed by industry specialists with more than 8 years of expertise in the field. IDMTECHPARK offers a staff of highly skilled professional trainers who deliver effective IT training in a friendly setting, concentrating on the needs of each individual to help them succeed in a demanding work world. In the book of career and success, our staff never leaves a page unturned.

IDMTECHPARK's versatile instructor-led training class rooms and lower-class sizes enable people to engage more easily and absorb knowledge, resulting in remarkable results for both themselves and the organizations for which they work. Our training programmes are adaptable and customizable to ensure that each participant gets the most out of their time with us. IDMTECHPARK focuses in providing hands-on IT training in over 30 different courses.

- We teach in-demand courses
- We provide impactful learning material
- Our teachers are well-selected & trained
- We follow world-class teaching methods
- Our courses include E-Projects
- We conduct technical workshops
- Exams are held and based on Exams providing Certification
- Certificates are recognized the world over
- Our course timings are flexible

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# Our Recent Placement

Idmtechpark assists students in getting job placements on successful completion of their courses. Idmtechpark also provides recruitment assistance to organizations. Idmtechpark students are shortlisted based on the organization's requirement. To make students job-ready, Idmtechpark conducts workshops e.g. How to do Group Discussions, how to behave in a Personal Interview. From time to time, job fairs & campus recruitments are conducted. Workplace skills such as time management, making effective presentations and communication skills are also provided. All this helps students find appropriate jobs in the IT industry while also helping save companies recruitment costs.

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Gray Matter


**Ramesh**

TDT

## Siva Sankar

ST Cloudspark tech


## Nabeel Hisham

VTail


## Kalayarasan

Violet Infotech

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# Our Alumini Working At

MODULE 1

# Introduction to Data Analytics

- What is Data Analytics?
  - Definition, scope, and key concepts
  - The difference between Data Analytics, Data Science, and Data Engineering
- Data Analytics Process
  - Data collection, data cleaning, analysis, interpretation, and reporting
- Applications of Data Analytics
  - Business intelligence, marketing, healthcare, finance, and more

MODULE 2

# Introduction to Data Types and Structures

- Data Types Overview
  - Structured vs. unstructured data
  - Types of data: Qualitative vs. Quantitative
- Data Structures
  - Arrays, lists, tables, and databases
  - Data frames and their usage in analytics tools like Pandas

MODULE 3

# Introduction to Analytical Tools and Software

- Overview of Analytical Tools
  - Excel, SQL, Python, R, Tableau, Power BI
- Introduction to Excel for Data Analytics
  - Basic formulas, functions, and data manipulation
  - Pivot tables, charts, and conditional formatting

MODULE 4

# Data Collection and Data Sources

- Data Collection Techniques
  - Survey data, web scraping, APIs, and databases
  - Sampling methods (random, stratified, etc.)
- Data Sources
  - Public datasets, corporate data, real-time data streams, and proprietary data

MODULE 5

# Data Cleaning and Preprocessing

- Data Quality and Importance of Cleaning
  - identifying and handling missing data
  - Dealing with outliers and duplicates
- Data Transformation Techniques
  - Normalization, standardization, encoding categorical variables
  - Merging and reshaping datasets (using tools like Pandas)

MODULE 6

# Exploratory Data Analysis (EDA)

- EDA Techniques and Purpose
  - Data summarization: descriptive statistics (mean, median, mode, etc.)
  - Visualizing data: histograms, box plots, and scatter plots
- Finding Patterns in Data
  - Identifying relationships between variables using correlation
  - Creating and interpreting data visualizations

MODULE 7

# Descriptive Statistics for Data Analytics

- Central Tendency and Dispersion
  - Measures of central tendency: mean, median, mode
  - Measures of variability: range, variance, standard deviation
- Distribution of Data
  - Understanding normal, skewed, and bimodal distributions
  - Quantiles and percentiles

MODULE 8

# Probability and Its Applications

- Introduction to Probability
  - Basic probability concepts: outcomes, events, and probability rules
  - Conditional probability and Bayes' theorem
- Probability Distributions
  - Uniform, normal, binomial, Poisson distributions
  - How probability distributions are used in analytics

MODULE 9

# Inferential Statistics

- Sampling and Sampling Distributions
  - Types of sampling methods and sample size considerations
  - Central limit theorem and sampling distributions
- Hypothesis Testing
  - Null hypothesis, alternative hypothesis, and p-values
  - T-tests, chi-square tests, ANOVA, and z-tests

MODULE 10

# Regression Analysis

- Simple Linear Regression
  - Regression equation, slope, intercept, and prediction
  - Interpreting regression coefficients and goodness of fit (R-squared)
- Multiple Linear Regression
  - Multiple predictors, multicollinearity, and assumptions of regression
  - Evaluating models with adjusted R-squared, F-tests, and residuals

MODULE 11

# Classification Techniques

- Overview of Classification Algorithms
  - Logistic Regression, Decision Trees, and Random Forest
- Model Evaluation for Classification
  - Confusion matrix, accuracy, precision, recall, F1-score, ROC curve

MODULE 12

# Time Series Analysis

- Introduction to Time Series Data
  - Components of time series: trend, seasonality, noise
  - Stationarity and autocorrelation
- Time Series Forecasting
  - Moving averages, Exponential Smoothing, ARIMA models
  - Forecasting using Python/R libraries

MODULE 13

# Data Visualization Techniques

- Fundamentals of Data Visualization
  - Principles of effective data visualization
  - Choosing the right chart types for different data
- Tools for Visualization
  - Creating charts and graphs in Excel, Python (Matplotlib, Seaborn), Tableau, Power BI
  - Designing interactive dashboards

MODULE 14

# Introduction to SQL for Data Analytics

- Time Series Data
  - Understanding time series components: trend, seasonality, noise
  - Autocorrelation and stationarity
- Time Series Forecasting
  - ARIMA, SARIMA, Holt-Winters exponential smoothing
  - Advanced forecasting techniques

MODULE 15

# Advanced Data Analysis with Python and R

- Advanced Python Libraries
  - Pandas, NumPy, SciPy for statistical analysis
  - Matplotlib, Seaborn for visualization, and SciKit-Learn for machine learning
- R for Data Analytics
  - R basics, data manipulation with dplyr, and visualization with ggplot2

MODULE 16

# Advanced Excel Techniques for Data Analytics

- Advanced Excel Functions
  - VLOOKUP, INDEX-MATCH, and pivot tables
  - Array formulas, data validation, and conditional formatting
- Excel Dashboards
  - Building interactive dashboards and reports
  - Automating tasks using Excel macros (VBA)

MODULE 17

# Machine Learning for Data Analytics

- Introduction to Machine Learning
  - Supervised vs. unsupervised learning
  - Classification vs. regression tasks
- Common Algorithms
  - K-Nearest Neighbors (KNN), Decision Trees, and Random Forest
  - Support Vector Machines (SVM) and Naive Bayes

MODULE 18

# Data Analytics in Business Intelligence

- Business Intelligence (BI) Overview
  - Key concepts in BI: data warehousing, OLAP, and reporting
  - BI Tools: Tableau, Power BI, Looker
- BI Dashboards and Reporting
  - Designing KPIs, metrics, and scorecards
  - Building dynamic dashboards for decision-makers

MODULE 19

# Predictive Analytics

- Predictive Modeling Techniques
  - Regression analysis for prediction
  - Time series forecasting, classification models for predicting outcomes
- Evaluating Predictive Models
  - Performance metrics for prediction (mean absolute error, mean squared error)

MODULE 20

# Text Analytics and Sentiment Analysis

- Text Mining Techniques
  - Tokenization, stemming, and lemmatization
  - TF-IDF (Term Frequency-Inverse Document Frequency)
- Sentiment Analysis
  - Using NLP techniques to analyze text sentiment
  - Application of sentiment analysis in social media, customer reviews, etc.

MODULE 21

# Big Data Analytics

- Overview of Big Data
  - Characteristics of big data (Volume, Variety, Velocity)
  - Big Data tools and technologies: Hadoop, Spark
- Analyzing Big Data
  - Data processing with MapReduce, Spark SQL
  - NoSQL databases: MongoDB, Cassandra, and others

MODULE 22

# Data Ethics and Privacy

- Ethics in Data Analytics
  - Data privacy, data protection laws (GDPR, CCPA)
  - Ethical considerations in data collection and analysis
- Bias in Data Analytics
  - Understanding and addressing biases in data and models
  - Fairness, accountability, and transparency in analytics

MODULE 23

# Data Analytics for Marketing

- Marketing Analytics Overview
  - Customer segmentation, targeting, and positioning
  - ROI analysis, customer lifetime value, and cohort analysis
- Tools for Marketing Analytics
  - Google Analytics, social media analytics, CRM systems
  - A/B Testing and campaign performance evaluation

MODULE 24

# Data Analytics for Financial Analysis

- Financial Modeling and Forecasting
  - Time series analysis for financial forecasting
  - Risk analysis and portfolio optimization
- Quantitative Finance Analytics
  - Monte Carlo simulations, Black-Scholes model
  - Value-at-risk (VaR) and other financial metrics

MODULE 25

# Capstone Project and Case Studies

- End-to-End Data Analytics Project
  - Problem definition, data collection, cleaning, EDA, modeling, and reporting
- Case Study Presentations
  - Presenting the analysis process, results, and insights to stakeholders
  - Peer reviews and constructive feedback

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# Thank You

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