MAHARASHTRA STATE BOARD OF SKILL DEVELOPMENT, MUMBAI

1	Name of Syllabus	C. C. IN **Data analysis using Python and R** (101214)
2	Max. Nos of Student	25 Students
3	Duration	6 months
4	Type	Part Time
5	Nos Of Days / Week	6 Days
6	Nos Of Hours /Days	1 hrs.
7	Space Required	1) Workshop = 300 sq. feet 2) Class Room = 200 sq. feet TOTAL = 500 sq. feet
8	Entry Qualification	Diploma /Degree in computer, IT, Electronics or Electronics telecommunication, BCA/ MCA/ BSC Computer, MSC Computer.
9	Objective Of Syllabus/ introduction	Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. The Python interpreter and the extensive standard library are freely available in source or binary form for all major platforms. Python was originally a general purpose language. But, over the years, with strong community support, this language got dedicated library for data analysis and predictive modeling. • This course is a complete design to learn data science using python from scratch. • It will also help you to learn basic python and R programming.
10	Employment Opportunity	Business Intelligence Analyst, Data Analyst, Data Scientist, Data Engineer , Quantitative Analyst, Data Analytics Consultant, Marketing Analyst, Project Manager, Python Developer.
11	Teacher's Qualification	BCA/ MCA/ BSC Computer, MSC Computer, B.E Computer / IT / Electronics With Knowledge of Tableau and MySQL.

12	Training System	Training System Per Week Theory: 6hrs; Practical: 18hrs; Total: 24hrs
13	Exam. System	

Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Mini. Marks
1	10121411	Python	TH- I	2 hrs.	100	35
2	10121412	R	TH- II	2 hrs.	100	35
3	10121421	Python	PR- I	6 hrs.	100	50
4	10121422	R	PR-II	6 hrs.	100	50
5		Internship		1 Month		
		Total			400	175

List of Equipment required for a batch for 25 Students.

1. 25 Computers with latest technology at least Core i3, 7th generation or higher processor.
2. 1 Server with higher configuration.
3. 1 Laptop for Teacher with latest technology at least Core i3, 7th generation or higher processor
4. Internet connectivity and LAN connectivity between all computers.
5. Scanner and Laser Printer.
6. One projector for presentation with sound system.
7. Mic and Speaker sets.

Syllabus – Python

	Get Started in Python, Syntax, Comments, Variables, Data Types, Numbers Casting, Strings, Booleans, Operators, Lists, Tuples, Sets, Dictionaries, If...Else, While Loops, For Loops, Functions, Lambda, Arrays, Classes/Objects, Inheritance Iterators, Scope, Modules, Dates, Math, JSON, RegEx, PIP, Try...Except, User Input, String Formatting
	File Handling File Handling, Read Files, Write/Create Files, Delete Files
	Python NumPy Intro, Getting Started, Creating Arrays, Array Indexing, Array Slicing, Data Types, Copy vs View, Array Shape, Array Reshape, Array Iterating, Array Join, Array Split, Array Search, Array Sort, Array Filter, Random, ufunction.
	Python Matplotlib Matplotlib Intro, Get Started, Pyplot, Plotting, Markers, Line, Subplots, Scatter, Bars , Histograms,Pie Charts
	Python SciPy SciPy Intro, Getting Started, Constants, Optimizers, Sparse Data, Graphs, Spatial Data

	, Matlab Arrays, Interpolation, Significance Tests
	Machine Learning Getting Started, Mean Median Mode, Standard Deviation, Percentile, Data Distribution Normal Data Distribution, Scatter Plot, Linear Regression, Polynomial Regression, Multiple Regression, Scale, Train/Test, Decision Tree
	Python MySQL MySQL Get Started, MySQL Create Database, MySQL Create Table, MySQL Insert MySQL Select, MySQL Where, MySQL Order By, MySQL Delete, MySQL Drop Table, MySQL Update, MySQL Limit, MySQL Join.
	Case Study – 1. English Thesaurus - a program where users can find the word definitions 2. River Web Map - an interactive web map showing River locations 3. Personal Website with Python - a website built entirely in Python 4. Bookshop Database App - a desktop GUI app with a database backend 5. Webcam Motion Detector - starts the webcam and detects moving objects 6. Real Estate Web Scraper - a program that extracts data from webpages 7. Interactive Data Dashboard - a web-based fully interactive graph 8.Database Web App - a web app that collects data & sends emails

Syllabus R –

	Overview, Environment Setup, Basic Syntax, Data Types, Variables, Operators, Decision Making, Loops, Functions, Strings, Vectors, Lists, Matrices, Arrays, Factors Data Frames, Packages, Data Reshaping.
	R Data Interfaces CSV Files, Excel Files, Binary Files, XML Files, JSON Files, Web Data, Database
	R Charts & Graphs Pie Charts, Bar Charts, Boxplots, Histograms, Line Graphs, Scatterplots
	R Statistics Examples Mean, Median & Mode, Linear Regression, Multiple Regression, Logistic Regression Normal Distribution, Binomial Distribution, Poisson Regression, Analysis of Covariance, Time Series Analysis, Nonlinear Least Square, Decision Tree, Random Forest, Survival Analysis, Chi Square Tests
	Case Study – 1. Uber Data Analysis 2. Movie recommendation system. 3. Credit Card Fraud Detection