Syllabus

Artificial Intelligence Associate

S No.	NOS/Module Name	Topics	Duration (Hours)		Learning Outcomes
			Theory	Lab	
1	Programming with Python	• Installing and configuring Python IDE • Understanding Python syntax, data types, operators, control flow • Working with built-in data structures – lists, tuples, dictionaries, sets • Functions, modular programming and package management • Small project using multiple modules and packages	20	40	• Students will be able to learn to install and configure the python IDE and learn about working on collaborative cloud interface required for programming • Students will understand the basics of Python Language and will be able to recognize Python syntax • Students will understand and write programs in python language, compile, debug and handle exceptions • Student will have an understanding of working with top down or bottom up approach by making functions. • Students will come to know about benefits of modular programming by defining and calling various functions. • Students will be able to explain various ways of passing the parameters to functions and difference between all the ways. • Students will learn the working of different data structures which allow to organize and store data.

2	Conceptualizing Data Science with python	• Introduction to Data Science concepts and tools • Preprocessing and cleaning raw data • Using NumPy for numerical operations and array handling • Statistical analysis using Python	23	37	• Students will learn about the concept of Data Science that relies on mathematical and statistical formulas to extract data and make sense of it. • Students will learn about unstructured and raw data and how to convert that into meaningful form. • Students will learn about how data can be converted into assets to help improve revenue by improving customer experience, and more. • Students will learn about various tools used for processing volumes of data. • Students will learn about techniques to pre-process the data to make it ready for analysis. • Students will learn about the library which deals with n-dimensional arrays. • Students will work on the library to perform a wide variety of mathematical operations on arrays.

3	Data analysis and Visualization	• Using Pandas for structured data analysis • Data Frames and Series in Pandas • Exploratory Data Analysis (EDA) techniques • Creating data visualizations using Matplotlib and Seaborn	30	60	• Student will be able to distinguish the differences between Numpy and Pandas. • Students will be able to analyze Big Data and make conclusions based on statistical theories. • Students will learn to represent data in way that will facilitate better results for data science projects. • Students will learn to use Pandas for cleaning messy datasets, and make them readable and relevant through huge set of commands and features. • Students will learn to filter, segment, merge and segregate the datasets. • Students will be able to demonstrate the role of Pre-processing, Analysis and Data science through guided case study and exercise • Student will learn how business problems can be understood by using Visualization techniques.
4	Fundamentals of Machine Learning	• Introduction to ML and learning types (supervised, unsupervised, reinforcement) • Setting up ML environment with Scikit-learn • Building and evaluating ML models	12	18	• Students will learn the concept of Machine Learning and its various categories and its application. • Students will be able to understand the difference between Supervised, unsupervised, and reinforcement learning • Students will be able to understand different paths of Machine Learning, i.e., Computer Vision, Predictive Analysis, Natural Language Processing and other applications. • Student will be able to implement ML models using various Classification and Regression algorithms. • Students will be able to understand the complete cycle of AI Project. • Student will be applying models using various algorithms in Scikit-learn library.

5	Performance and Accuracy of Machine Learning models.	• Predictive analysis with regression and classification • Statistical techniques for model building • Feature selection and evaluation metrics • End-to-end ML project implementation	35	55	• Students will be able to make predictions about future events by applying various Regression algorithms and Classification algorithms. • Students will learn to apply ML models to analyze historical data with the goal of identifying trends or patterns and then using those insights to predict future outcomes. • Students will apply various statistics techniques like Correlation, hypothesis, Normal Distribution etc. to build a good predictive model. • Students will learn to measure predictive validity by applying various metrics of classification and regression. • Students will enhance predictive models by using Feature Selection, highlighting patterns and bringing domain expertise. • Students will learn how good metrics measure progress and bring improvement with respect to the business problem.
Sub Total = 330 hours			120	210	
6	Employability Skills		60		Students will be able to get the additional skills apart from the technical skills, to be job ready
7	OJT/Project		60		Students will be able to learn the working in a job.
Total Duration			**450**		