

COURSE PROSPECTUS

Name of the Group: IT Group

Name of the Course: PG Program in Data Analytics and Artificial Intelligence

Course Code: SW900

Starting Date: 16-Apr-2024

Duration: 24 weeks

Course Coordinator: PrasoonKumar KG, Ph: 04952287266,mob:9447305951

No. of Seats: 50

Preamble: In today's world there exists data available in abundance from variety of sources like web server logs, social media, and large databases and from diverse domains like Ecommerce, Medical, Scientific etc. Big data analytics is the process of examining these data to uncover hidden patterns, unknown correlations and other useful information that can be used to make better decisions. Business people, Doctors, Scientists et al. can use this to improve their services.

The main challenge to the analysis of big data comes because of the 4 V's—volume, velocity, variety and veracity. For effective analytics, we need to deal with high volume of data of different variety which is being generated in high velocity. The data what is available from such sources is highly unstructured which calls for analytics on the same.

This course is designed to make the participants capable of solving problems using Artificial Intelligence related technologies.

Objective of the Course: The objective is to make the participants capable of identifying and applying appropriate techniques and tools to solve problems in managing huge quantity of data.

Outcome of the Course: After completing the course, the participants will be capable of formulating AI problems that can be solved with the raw data available in different domains. They will be able to do basic data analysis and machine learning model development with structured data. They will also be able to do suitable predictions and decision making by handling unstructured data including text, images and video using deep learning and natural language processing.

Expected Job Roles: Data Scientist / Data Analyst / Data Engineer

Course Structure:

SlNo	Module Name	Duration (Hours)			Credit		
		Theory	Practical	Total	Theory	Practical	Total
1	Linux OS	24	36	60	0.5	0.8	1.3
2	Python Programming	48	72	120	1.0	1.6	2.6
3	Statistical / Mathematical Foundation for Data Science	24	36	60	0.5	0.8	1.3
4	BigData, Data Analytics	48	72	120	1.0	1.6	2.6
5	Machine Learning	60	90	150	1.3	2.0	3.3
6	Deep Learning	24	36	60	0.5	0.8	1.3
7	Natural Language Processing and Reinforcement Learning	12	18	30	0.3	0.4	0.7
8	Project work	10	110	120	0.2	2.4	2.6
	Total	250	470	720	5.5	10.4	16

Other Contents

I. Course Fees:

Course fee is Rs.45,000 + all taxes as applicable

Modular wise Course Fee: Not Applicable for this course

II. Registration Fee:

An amount of Rs.1000/- (including all taxes as applicable) should be paid at the time of registering for the course. The amount is nonrefundable.

This fee shall be considered as part of course fee, if the student joins the course. If a student register and pay for more than one course and join for any one course, all such amount will be adjusted against the course fee payable.

If the student does not join for the registered course / any of the registered courses, fee paid shall be forfeited.

However above the registration fee shall be refunded on few special cases as given below

- Course postponed and new date is not convenient for the student
- Course cancelled in advance, well before the admission date

III. Course Fee Installment Structure:

Students can pay the full fees of **Rs.53100/-** (Rs.45000/- + all taxes as applicable) in advance or as installments as given below

Fee Type	*Amount	#Due Date (on or before)
Registration Fee	Rs.1000/-	During Registration
1 st Installment	Rs.22100/-	16-Apr-2024
2 nd Installment	Rs.25000/-	14-Jun-2024
Total	Rs.53100/-	-

* Above fees is inclusive CGST 9%, SGST 9%, and revision, if any, by Government, shall be applicable at the time of payment.

Fine will be applicable to late fee payment.

IV. Eligibility: BE/ BTech (any stream), BSc (IT/ Computer Science/ Electronics/ Physics/ Chemistry/ Mathematics/ Statistics), BCA, 3 year Diploma (any stream), Graduation in any stream with [PGDCA / NIELIT A or B level], OR equivalent to any of these with good computer programming knowledge.

V. Number of Seats : 50

VI. Selection of candidates: Selection of candidates will be based on the marks obtained in their qualifying examination.

VII. Test/Interview : Not Applicable

VIII. Counseling/Admission : 16-Apr-2024

IX. Important Dates:

Last date for submitting application : **11- Apr - 2024**

Selection intimation through website: **12- Apr - 2024** (After 5.00 PM)

Counseling/Admission : **16- Apr -2024**

X. Course Timings: 9.30 am to 12.30 pm (Theory) and 2.00 pm to 5.00 pm (Practice) on Mon, Tue, Thu and Fri. 9:30am to 5:00pm (practice) on Wed.

XI. Placement : Placement Assistance shall be provided

XII. Lab Facilities

The IT Lab is equipped with Intel Xeon Dual Processor based servers from HP, IBM, DELL, HCL, managed gigabit switches and more than 100 networked PCs with internet facility. A variety of software is available which include various flavors of Windows and Linux Operating Systems like Windows, RedHat Enterprise Linux/CentOS 6/7, RT Linux, OpenStack, CloudStack, OpenVAS/Nessus and various commercial and open source development tools, database and cloud servers.

XIII. Course Contents :

Linux OS (2 weeks)

Linux environment, basic commands, shell concepts, Shell scripting, built-in tools for data analysis.

Python Programming (4 weeks)

Python -features, program execution, data structures, List, Dictionary, Tuples, If statements, looping and loop control statements, Functions and Modules, Generators, import statement, namespaces-packages, Class concepts, Exception handling, Regular Expressions, Database access, XML parsing, date time and time zones.

Statistical / Mathematical Foundation for Data Science (2 Weeks)

Basic probability concepts, Conditional probability, Bayes Theorem, Probability distributions, Continuous and discrete distributions, Normal distribution, Poisson distribution, Binomial distribution, Correlation and Covariance, Hypothesis Testing.

Differential Calculus - Slope of a straight line/Curve, Derivatives and optimization, Partial derivatives, Gradient Descent.

Linear Algebra -Vectors, Norm of a vector, Dot product, Matrices, Matrix multiplication, transpose, Geometric applications of matrix operations.

Big Data, Data Analytics (4 Weeks)

Hadoop Architecture and HDFS, Configuring Hadoop, Mapreduce Architecture with examples, YARN Architecture, nosql databases, Hadoop subprojects, Familiarization of Spark.

Analysis using spread sheets - Formulas and Functions, Charting, Pivot table, What if analysis.

Analysis using python - Exploring numpy module -arrays and array operations, indexing and slicing, mathematical and statistical functions.

Pandas - Series and Data frames, Data loading and storage, Data cleaning and preparation, Data Wrangling, Data Aggregation, Time Series. Plotting using matplotlib, seaborn.

Machine Learning (5 weeks)

Supervised and Unsupervised Learning, Classification, Regression & Clustering, Model Evaluation Metrics, Machine Learning Algorithms-Linear Regression, KNN, K Means, Logistic Regression, Support Vector Machines, Decision Tree, Naïve Bayes, etc. Ensemble Learning and Random Forests, Bagging, Boosting, Dimensionality Reduction.

Deep Learning (2 weeks)

Artificial Neural Networks, Implementing MLPs with Keras, Tensorflow, Deep Neural Networks, Optimizers, Image Processing using OpenCV, Convolutional Neural Networks, Recurrent Neural Networks, Autoencoders and GANs.

Natural Language Processing and Reinforcement Learning (1 Week)

Natural Language Processing Methods, Basics of text processing, Lexical processing, Syntax and Semantics, Parts of Speech Tagging, Applications like Sentiment Analysis, Text Classification, Text Summarization, Document Clustering, Document Similarity, Web Crawling etc. Reinforcement Learning and its applications in AI.

Project Work (4 Weeks).

The participants have to do industry relevant project using real data.

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