NIELIT

राष्ट्रीयइलेक्ट्रॉनिकीएवंसूचनाप्रौद्योगिकीसंस्थान,कालीकट
National Institute of Electronics & Information Technology, Calicut

Ministry of Electronics and Information Technology
Government of India

सत्यमेव जयते

Online Course Prospectus

ISO 9001-2015 Certified

PG Program in Data Analytics and Artificial Intelligence

**Starting Date: 6th June 2024
(24 weeks, 5 Hours Daily)**

Course Description

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

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Course Name: PG Program in Data Analytics and Artificial Intelligence

Course Code: LSW900

Duration: 24 weeks / 600 Hours

      5 Hours per day (Live sessions, Recorded sessions, Assignments etc.)

      Online class Timing: 2:30 PM onwards

Course Fee: ₹29,500/- (Including GST)

Starting Date: 6th June 2024

Coordinator: Shri. Prasoon Kumar K G, 9447305951, prasoon@calicut.nielit.in

Qualification:

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

Course Content:

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.

Prerequisite (optional):

Knowledge in Computer Programming

In case students are not able to attend online live classes, the recorded lectures of all major classes are available in our Learning Management System (LMS). Students can access LMS by entering their user name and password and they can do offline reference and learn at their own pace and timings, during the course period. After attending the recorded lectures students can submit their assignments and interact through email / LMS / WhatsApp.

Course Fee and important dates:

Course fee	₹29,500/- (Including GST)
Registration fee	₹1000 /- (Added to Course fee)
Last date for registration & payment	5th June 2024
Sharing of online Link / passwords & other details	6th June 2024 @ 11:00 AM

Faculty Profile:

All faculty members involved in the course are having post graduate degrees in computer applications with several years of experience in the IT field.

Course Coordinator:

Shri. Prasoon Kumar K G

Scientist-D

9447305951, 0495-2287266 (O)

e-mail: prasoon@calicut.nielit.in

Certificate:

Digitally signed certificate of <u>successful completion</u> will be mailed to the registered email id after completion of course.

(Courses having evaluation in the end are entitled for successfully completed certification. In other cases only participation certificate will be issued. In both cases 60% attendance and feedback are mandatory.)

Terms and Conditions:

1. *In case any registered candidate could not attend the online session due to technical issue at their side there will not be any refund of the course fee and the sessions will not be repeated*

2. *In case the online course is cancelled /postponed due to some technical issue at NIELIT side and new date is not convenient to the candidate, our liability is limited to the refund of the course fee and NIELIT shall not be responsible for any consequential damages.*

3. *60% attendance and feedback submission are mandatory for awarding 'participation' certificate. For courses with assessment, 'successfully completed certificate' will be awarded subject to the candidate passing the test with minimum 50% marks, minimum 60% attendance and feedback submission.*

For more details about our institution and facilities visit us

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An Autonomous Scientific Society of
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