



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



सत्यमेव जयते

Ministry of Electronics and  
Information Technology  
Government of India

# On-line Courses Prospectus

ISO 9001-2015 Certified

## Certified AI Professional

Start Date: 21<sup>st</sup> Mar 2022

### 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 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.

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## Who can attend?

Anyone who is interested to build their career in AI domain including,

- Fresh graduates who wish to build their career in AI
- Experienced professionals who want to switch to AI domain.
- Faculty members or research scholars who want to specialize in AI.

## Course Content

Sl.	Module Title	Duration*		
		Theory	Lab	Total
1	Introduction to AI and Programming Tools	20	40	60
2	Machine Learning	10	20	30
3	Deep Learning	10	20	30
4	Natural Language Processing and Reinforcement Learning	15	30	45
5	Project	15	45	75
	<b>Total Duration</b>	60	180	240

\* Duration indicate the average time candidates should spent in each topic.

## Prerequisite

BE/BTech, BSc (IT/Computer Science/Electronics), BCA, 3 year Diploma (IT/Computer Science/Electronics), Degree holders with PGDCA, DOEACC A, B level Or equivalent of any of these having computer programming knowledge.

## Fee and important dates

Course Fee	Rs. 12000/- * (GST including)
Last date for registration and payment	17 <sup>th</sup> March 2022
Course Start Date	21 <sup>st</sup> March 2022

## Minimum hardware requirements

Attendees must have a computer system with a good internet connection. Preferably Linux OS installed or the candidates should install it as part of the course requirement.

## Faculty Profile

All the faculty members involved in the course are having more than 20 years experience in the IT industry proving training and consultancy.

- Mr. Prasoon Kumar KG, Principal Technical Officer
- Ms. Reshma C. B., Senior Technical Officer

## Course Coordinator

Prasoon Kumar KG  
Principal Technical Officer  
9447305951(M), 0495 2287266(O)  
Email: prasoon@calicut.nielit.in

## Admission

Selected candidates will be informed by mail/ selection list will be uploaded in website on **18-March-2022**. They should send the self-attested copy of the following documents through email on or before **28-March-2022**.

### Documents to be uploaded

1. Qualification proof
2. Address proof
3. Passport size photograph
4. Signature

## Mode of course Delivery

The course is conducted in a virtual classroom environment which is completely online, through Moodle Learning Management System. Course content include Lecture Videos, Live interactive doubt clearance sessions, Course material in text format, Links to external resources and blogs, Online Forums, Assignments, Tests etc.

The evaluation of the participants would be done very strictly, on a weekly basis through assignments, tests, online discussions etc. Participants can do doubt clarification through live interactive sessions/offline forum discussions. The total marks distribution will be announced at the beginning of the course. After every week the result of that week activities will be published. Certificate will be issued based on the cumulative score obtained by the candidate following the below grading scheme.

## Certificate

Certificate will be issued to all candidates who complete the course successfully.

## Grading Scheme

Grade	S	A	B	C	D	E	Participation Certificate only
<b>Marks Range (in %)</b>	>=90%	80%-89%	70%-79%	60%-69%	50%-59%	40%-49%	<40%
Participants should get pass grade for the individual modules also to get the certificate							

## Course Syllabus & Learning Objectives

Topics	Learning Objective
<b>Module-1 : Introduction to AI and Programming Tools</b>	
1.1 Linux Basics 1.2 Python Basics Data Types, Conditional Statements, Looping, Control Statements, String, List And Dictionary Manipulations, Python Functions, Modules And Packages, Object Oriented Programming in Python, Regular Expressions, Exception Handling, Popular python packages like pandas for data handling 1.3 Introduction to Database Management System & SQL, Database Interaction in Python. 1.4 Data Analysis & visualization – using numpy, matplotlib, scipy, pandas 1.5 Vectors, Lists, Matrices, Arrays, Data Frames  1.6 Data visualization - barplot, pie, scatterplot, histogram, scatter matrix 1.7 Probability and Statistics-Probability, Mean, Median, SD, Variance, Probability distributions - Normal distribution, Poisson distribution, Binomial distribution. Correlation and Regression.	After completion of this module, the candidate will be able to : <ul style="list-style-type: none"> <li>• Operate in Linux OS environment.</li> <li>• Design and write python applications.</li> <li>• Learn basics of database management systems and write python programs to interact with DBMS.</li> <li>• Write python programs to do data analysis and visualization using various libraries</li> <li>• Solve problems involving probability and do statistical data analysis using statistics and probability distribution . methods.</li> </ul>
<b>Module 2- Machine Learning</b>	
2.1 Structured and Unstructured Data 2.2 Data Preprocessing 2.1.1 Handling missing data 2.1.2 Data Standardization	After learning this module the participant will be able to <ul style="list-style-type: none"> <li>• grab raw data, clean it and make it ready for building machine learning models</li> </ul>

<p>2.1.2 Label Encoding  2.1.3 One hot encoding  2.3 Supervised and Unsupervised Learning  2.4 Classification, Regression &amp; Clustering  2.5 Linear Algebra  2.6 Machine Learning Algorithms  2.6.1 Linear Regression  2.6.2 KNN  2.6.3 K Means  2.6.4 Logistic Regression  2.6.5 Support Vector Machine  2.6.6 Decision Tree  2.6.7 Naïve Bayes, etc.  2.7 Ensemble Methods -Random Forest, Boosting and Optimization, etc.  2.8 Model Evaluation Metrics</p>	<ul style="list-style-type: none"> <li>• Identify the suitable task to be performed on data for useful model development</li> <li>• Apply suitable algorithm on the data to develop models</li> </ul> <p>Use suitable metrics to come up with the most suitable model for solving a particular task</p>
<p><b>Module -3 : Deep Learning</b></p>	
<p>3.1 Deep Learning Concepts  3.2 Artificial Neural Network  3.3 Deep Neural Networks  3.3.1 Convolutional Neural Network  3.3.2 Recurrent Neural Network  3.3.3 Tensorflow, Keras  3.3.4 Image Processing using OpenCV  3.3.5 Face Recognition  3.3.6 Video Analytics</p>	<p>After completion of this module the participants will be able to</p> <ul style="list-style-type: none"> <li>• Solve AI problems involving unstructured data.</li> <li>• Implement solutions for image related problems using Deep Learning</li> </ul>
<p><b>Module-4 : Natural Language Processing and Reinforcement Learning</b></p>	
<p>4.1 Natural Language Processing Methods  4.1.1 Basics of text processing  4.1.2 Lexical processing  4.1.3 Syntax and Semantics  4.1.4 Parts of Speech Tagging  4.1.5 Applications like Sentiment Analysis, Text Classification, Text Summarization, Document Clustering, Document Similarity, Web Crawling etc.  4.2 Reinforcement Learning and its applications in AI</p>	<p>After attending this module the participants will be able to</p> <ul style="list-style-type: none"> <li>• Implement solutions to text related problems using NLP</li> <li>• use reinforcement learning to solve AI related problems</li> </ul>
<p><b>Module-5 : Project</b></p>	
<p>The participants will be doing industry relevant project using real data.  5.1 Data Visualization project  5.2 Machine Learning project  5.3 Deep Learning project</p>	<p>After completion of the project</p> <ul style="list-style-type: none"> <li>• Participants will be able to formulate the right problems that can be solved using the data available at hand.</li> <li>• Design the solution and implement it using latest AI tools and methods.</li> </ul>

## 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.*

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