



राष्ट्रीय इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी संस्थान, दमन  
National Institute of Electronics & Information Technology, Daman

# Course Prospectus

## Certified AI Associate

Dec 2022-Feb 2023



# National Institute of Electronics & Information Technology D A M A N

An Autonomous Scientific Society of Ministry of Electronics and Information Technology, Govt. of India

## Achieving Excellence Together

National Institute of Electronics and Information Technology (NIELIT) is an autonomous body of Ministry of Electronics and Information Technology, Govt. of India. It is a premier organization for education, training, R&D and consultancy in IT and electronics.

NIELIT carries out Human Resource Development and related activities in the area of Information, Electronics & Communications Technology (IECT). It is engaged both in Formal & Non-Formal Education besides industry-oriented quality education and training programs in the state-of-the-art areas. NIELIT has endeavored to establish standards to be the country's premier institution for Examination and Certification in the field of Information, Electronics and Communication Technology.

The objective of NIELIT is to bridge the gap between the academic institutions and industries. It is an implementing agency for various Government schemes related to human resource development in the field of IECT.

Main focus of NIELIT is on delivering quality education in the future skills areas including Artificial Intelligence, Internet of Things, Data Analytics, 3D Printing, Cloud Computing, Virtual Reality, Robotic Process Automation & Cyber Security.

A centre of NIELIT is opened in Daman in the Union territory of Daman & Diu Dadra Nagar Haveli with the objective of providing quality education to the student community in DD & DNH, Gujarat and Maharashtra region.

# The Course

## Name of the Course

Certified Artificial Intelligence (AI) Associate

## Course Code

2022/ITES/NIELIT/05574

## Starting Date

06-12-2022

## Duration

7 Weeks

## NSQF Level

Level 4

## Course Coordinator

Vimala Mathew

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## Alternate Contact Person

Harshita Mandloi

Faculty Member

8349311986(M)

## Preamble

Intelligent machines have replaced human capabilities in many areas. Artificial intelligence is the intelligence exhibited by machines or software. It is the branch of computer science that emphasizes on creating intelligent machines that work and react like humans. Artificial Intelligence spans a wide variety of topics in computer science research, including machine learning, deep learning, reinforcement learning, natural language processing, reasoning, perception etc.

## Objective of the Course

This seven-week course presents the components of Artificial Intelligence to the participants. The participants will get to work with Machine learning, Neural Networks, explore the Platforms for AI, implement methods to solve problems using Artificial Intelligence.

## Outcome of the Course

This course is designed at par with the industry requirements to provide the participants in-depth knowledge and skills required by AI field around the globe. It provides comprehensive knowledge about the fundamental principles, methodologies and industry practices in AI.

## Expected Job Roles

ML Associate  
Data Analyst  
Machine Learning Engineer  
Deep Learning Engineer

## Course Structure

Sl. No	Modules	Duration(Hours)		
		Theory	Lab	Total
1	Python Programming	16	24	40
2	Statistical Concepts	8	12	20
3	Data Science and Analytics	8	12	20
4	Machine Learning	32	48	80
5	Deep Learning	32	48	80
6	Project	10	20	30
	Sub Total	106	164	270

## I. Course Fees

**General Candidates:** Course fee is Rs. 12000/- + taxes as applicable (currently GST 18%)

**SC/ST Candidates:** Tuition Fees is waived for SC/ST students However they are required to remit an amount of **Rs. 3000/- as Advance caution/security deposit**. This amount will be considered as caution/security deposit and will be refunded after successful completion of the course. If the student fails to complete the course successfully, this amount will be forfeited.

## II. Fee payment Schedule

Students should pay the full fees as per schedule below.

Fees	Amount for General Candidates		Amount for SC/ST Candidates.	# Due Date (on or before)
Course Fee, GST & Caution Deposit	Course fee	Rs 12,000	Rs.3,000 (Refundable after successful completion of course)	06-12-2022
	GST	Rs 2,160		
	Caution Deposit	Rs 2,000 (Refundable)		
	Total	Rs 16,160		

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

**III. Eligibility:**

BE/BTech/MCA in any discipline. Candidates pursuing final year are also eligible.

OR

BCA/ B.Sc. IT/ B.Sc. Electronics

OR

3 Years Diploma after class 10th in Electronics/ IT/ Electrical with 1 Years of Experience in IT Sector

OR

Level- 5 Qualified in IT Sector

**IV. Number of Seats**

40 (Forty)

**V. Selection of Candidates**

Selection is based on the marks in the qualifying degree.

**VI. Hostel Facility**

Hostel facility available outside campus (not owned by NIELIT)

**VII. Counselling/Admission**

6th December 2022

**VIII. Important Dates (if applicable)**

- Last date for submitting application: 25-Nov-2022
- Selection intimation through e-mail/website: 28-Nov-2022
- Counseling/Admission: 6-Dec-2022

**IX. Course Timings**

9.30 am to 5.00 pm on all working days.

**X. Placement:**

Placement assistance shall be provided

**XI. Course Registration Link**

<https://forms.gle/sppJFdkeanbubpS8>

Topics	Learning Outcome
<b>Python Programming</b>	
<ul style="list-style-type: none"> <li>• An Introduction to Python</li> <li>• Beginning Python Basics</li> <li>• Python Program Flow</li> <li>• Functions &amp; Modules</li> <li>• Exceptions Handling</li> <li>• File Handling</li> <li>• Classes in Python</li> </ul>	<ul style="list-style-type: none"> <li>✓ Capable of programming with Python</li> <li>✓ Able to prepare data for analysis using Python</li> <li>✓ Acquire pre-requisite Python programming language skills to move into specific branches like Machine Learning, Data Science, Deep Learning, Artificial Intelligence etc.</li> </ul>
<b>Statistical Concepts</b>	
<ul style="list-style-type: none"> <li>• Descriptive &amp; Inferential Statistics,</li> <li>• Probability Concept: Marginal, Joint &amp; Conditional Probability, Bayes Theorem</li> <li>• Probability Distributions</li> <li>• Hypothesis Test</li> <li>• Entropy &amp; Information Gain</li> <li>• Regression &amp; Correlation</li> <li>• Confusion Matrix, Bias &amp; Variance</li> </ul>	<ul style="list-style-type: none"> <li>✓ Understand the mathematical principles required for Machine Learning.</li> <li>✓ Able to Apply the principles in developing the Learning Models</li> <li>✓ Able to implement model in Python.</li> </ul>
<b>Data Science and Analytics</b>	
<ul style="list-style-type: none"> <li>• An Introduction to Data Science and Analytics</li> <li>• Data Analysis Using NumPy</li> <li>• Data Analysis Using Pandas</li> <li>• Data Visualization – Pandas, Matplotlib, Seaborn, Plotly and Cufflinks</li> </ul>	<ul style="list-style-type: none"> <li>✓ Principles of Data Science and analytics</li> <li>✓ Able to use NumPy for numerical data</li> <li>✓ Able to use Pandas for data analysis</li> <li>✓ Able to use data visualization tools for interactive dynamic visualization</li> </ul>

Machine Learning	
<ul style="list-style-type: none"> <li>• Introduction to Machine Learning</li> <li>• Linear Regression</li> <li>• Logistic Regression</li> <li>• K-Means Clustering</li> <li>• Decision Tree</li> <li>• Random Forest</li> <li>• K-Nearest Neighbours</li> <li>• Support Vector Machine</li> <li>• Naive Bayes</li> <li>• Principal Component Analysis (PCA)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Understanding of Machine Learning algorithm.</li> <li>✓ Develop expertise in implementing ML algorithm using Python.</li> <li>✓ Able to use Machine Learning Sklearn-tool for various applications.</li> <li>✓ Able to understand the fundamentals of PCA</li> </ul>
Deep Learning	
<ul style="list-style-type: none"> <li>• Introduction to Deep Learning</li> <li>• Artificial Neural Network - ANN</li> <li>• Loss Function</li> <li>• Bias &amp; Gradient Descent</li> <li>• Stochastic Gradient Descent</li> <li>• Convolution Neural Networks - CNN</li> <li>• Recurrent Neural Networks - RNNs</li> <li>• Natural Language Processing - NLP</li> <li>• Computer Vision using OpenCV</li> <li>• Deployment</li> </ul>	<ul style="list-style-type: none"> <li>✓ Understanding Deep Learning Algorithm.</li> <li>✓ Learn to use Deep Learning tool Keras-Tensorflow and OpenCV for various applications</li> <li>✓ Develop expertise in implementation of various Neural Network based DL algorithms using Python</li> </ul>
Case Studies	
<ul style="list-style-type: none"> <li>• Covid-19 data Analysis</li> <li>• Data Pre-processing and Data Analysis for Banking Application</li> <li>• Predictive Analysis for Housing Prices</li> <li>• Kaggle's Titanic Survival</li> <li>• Numerical Digit Image Classification using Regression Algorithm</li> <li>• Medical Diagnosis using ML (Diabetic and Cancer)</li> <li>• Implementation of Spam filtering messages for Mails</li> <li>• Hand Written Number Image Classification Using CNN</li> <li>• Complex image recognition (CIFAR) using DL</li> <li>• Creating Sin wave Signal using RNN</li> <li>• Use Deep Learning for medical imaging</li> </ul>	
Project	
<ul style="list-style-type: none"> <li>• Participants should do an Industry relevant project based on a data of their choice.</li> </ul>	



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### **NIELIT Daman**

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