राष्ट्रीय इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी संस्थान, चेन्नई
National Institute of Electronics & Information Technology, Chennai

Ministry of Electronics & Information Technology
Government of India

नेशनल इंस्टीट्यूट ऑफ इलेक्ट्रॉनिक्स एंड इंफॉर्मेशन टेक्नोलॉजी, चेन्नई
National Institute of Electronics and Information Technology, Chennai

Autonomous Scientific Society of Ministry of Electronics & Information Technology (MeitY), Govt. of India

ISTE Complex, 25, Gandhi Mandapam Road, Chennai - 600025

Course Prospectus

Certified Artificial Intelligence (AI) Associate

(NSQF Level-7*)

Mode: ONLINE (Blended)

*This course is submitted for NSQF-Alignment Approval.

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Course Prospectus

Course Name: Certified Artificial Intelligence (AI) Associate

Course Code: AI 300

NSQF Level: Proposed to Align with NSQF Level-7

Duration: 240 Hours

Last Date of Registration: 07-01-2022

Course Start Date: 17-01-2022

Fee Details:

Registration Fee- Rs. 1000/- (Refundable for SC/ST*)

Tuition Fee- Rs.10, 900/-(Refundable for SC/ST*)

Preamble:

Artificial Intelligence has grown to be very popular in today's world. Artificial intelligence (AI) is a wide-ranging branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence. These machines are able to learn with experience and perform human-like tasks. As technologies such as AI continue to grow, they will have a great impact on our quality of life. It's but natural that everyone today wants to connect with AI technology somehow, may it be as an end-user or pursuing a career in Artificial Intelligence.

AI has emerged as a leading technology used in the Booming areas like Machine Learning (ML), Internet of Things (IoT) and Data analytics. Currently available academic curriculum is not much enough to fulfil the requirement of Skills needed for AI in Industry. This course will offer required skills and hands-on experience in AI to candidate and professionals; this will increase the employability opportunity for candidate and bridge the gap of Skilled Human requirement for Industry.

Objective of the Course:

The Objective is to develop the skills required for AI Technologies with the use of Python to analyse data, create beautiful visualizations, and problem solving using powerful Machine Learning and Deep Learning algorithms.

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Outcome of the Course:

After successful completion of this Course, students will be able to:

- Develop problem solving capability using python scripts
- Able to use Descriptive & Inferential Statistics concepts in Data Analysis And Algorithm Development
- Learn to Analyse and Process the Data
- Able to use Data Analytics tools: Numpy, Panda for various applications
- Able to develop applications using Machine Learning Algorithms & Scikit tool
- Develop DL models using Keras, TensorFlow tool

Full Flow of Course:
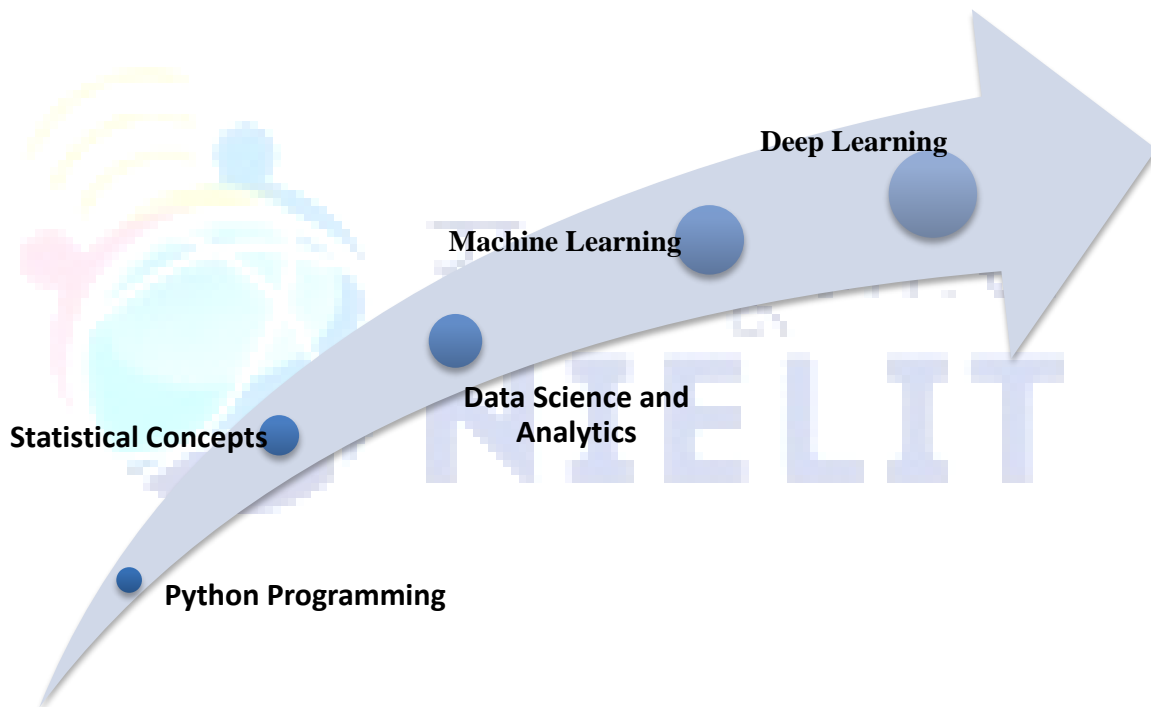
Course Structure:

This course contains totally five modules as given in the table below.

Module Code	Module Name	Duration(in Hours)
AI301	Python Programming	30
AI302	Statistical Concepts	20
AI303	Data Science and Analytics	30
AI304	Machine Learning	80
AI305	Deep Learning	80
	Total	240

Course Fees:

Registration Fee- Rs. 1000/- (Refundable for SC/ST*)

Tuition Fee- Rs.10, 900/-(Refundable for SC/ST*)

Course fee is Rs. 11,900/- Including GST. (Can be paid as a single instalment of Rs. 10, 900/-)

Registration Fee	Rs. 1000/- for SC-ST (Refundable*)	Rs. 1000/- for others Adjustable with Training Fee	
Instalment No.	SC-ST Candidates (Fee including GST in Rs.)	General Candidates (Fee including GST in Rs.)	Last Date
1	10,900.00*	10,900.00	15-01-2022
Total	10,900.00*	10,900.00	

*Fees will be refunded subject to meeting the following Condition:
This course is submitted for NSQF-Aligned Course Approval. If it is approved, tuition Fees will be refunded for eligible SC/ST students who will be successfully completing the course with NSQF certification under SCSP/TSP scheme.

*GST is Applicable as per Govt. Norms GST (currently it is 18%).

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Apart from above fee, following fee to be paid by all selected candidates (excluding SC-ST candidates#) directly while applying for NSQF registration and NSQF examination:

1. *NSQF registration fee of Rs.200+GST= Rs.236/- while applying for the NSQF registration*
2. *NSQF Examination fee of Rs.2600/- while registering for examination*

 # Important Note: This course is submitted for NSQF-Aligned Course Approval. Fee Relaxation will subject to the approval of NSQF.

Registration Fee- Refund Policy:

(**Non-Refundable if candidate is selected for admission but did not join and if a candidate has applied but not eligible.**)

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

✓ Candidates are eligible but not selected for admission.
✓ Course postponed and new date is not convenient for the student.
✓ Course cancelled.

Eligibility:

✓ 5th Semester onward BE/B. Tech and above or
✓ Final year MCA/M. Sc. and above or
✓ NIELIT A level(IT) with Mathematics/Statistics at Graduation Level or
✓ NSQF Aligned Level – 6(L6) Course in (AI/ML/Data Science/Data Analytics)

Number of Seats: 30 (Thirty) – Total

Category	No. of Seats
SC (15%)	4
ST (7.5%)	2
GENERAL	24
Total	**30**

Note: Seats are allocated based on the Merit of the Qualification.

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NIELIT

रा.इ.सू.प्रौ.सं

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How to Apply?

Candidates can apply online in our website http://reg.nielitchennai.edu.in. Payment towards non-refundable registration fee can be paid through any of the following modes:

- ✓ Online transaction: Account Name: NIELIT CHENNAI, Account No: 31185720641, Bank name: State Bank of India (SBI), Branch: Kottur (Chennai), IFSC Code: SBIN0001669.
- ✓ Pay through UPI Mobile Apps
- ✓ DD drawn from a nationalized bank (preferably SBI) in favour of ―NIELIT Chennai payable at Chennai.

Note: *The Institute will not be responsible for any mistakes done by either the bank concerned or by the depositor while remitting the amount into our account*

Last date of Registration: 7th January, 2022

Registration Procedure:

All interested candidates are required to fill the Registration form online with registration fees before **7th January, 2022** with all the necessary information.

Selection Criteria of Candidates:

The selection to the course shall be based on the following criteria:

Selection of candidates will be based on their marks in the qualifying examination subject to eligibility and availability of seats.

- ✓ Each registered candidates need to appear for the written examination on **11-01-2022**.The candidate who qualifies the exam will be provisionally selected for the course.
- ✓ The first list of Provisionally Selected Candidates will be published on NIELIT Chennai website (www.nielit.gov.in/chennai) on **12-01-2022** by **5:00 PM**. In case of vacancy, an additional selection list will be prepared and the selection will be intimated by email only.
- ✓ Provisionally selected candidate has to upload their document on registration portal for online verification.

- ✓ **For SC/ST :**
  - Original Copies of Proof of Age, Qualifying Degree (Consolidated Mark sheet & Degree Certificate/Course Completion Certificate), 10th and 12th mark sheets.
  - Self-attested copy of community certificate.
  - AADHAR Identity proof must for SC/ST Candidates (For availing concession).
  - One passport size photograph.

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- ✓ **For Others (General, OBC, EWS) :**
  - Original Copies of Proof of Age, Qualifying Degree (Consolidated Mark sheet & Degree Certificate/Course Completion Certificate), 10th and 12th mark sheet.
  - One passport size photograph.
  - Self-attested copy of Govt. issued photo ID card

- ✓ After document verification, selected candidates (other than SC-ST*) have to pay first instalment of Rs. **10,900/-** or as applicable on or before **15-01-2022** by payment mode mentioned above. Selected candidates are requested to upload the proof of remittance of fee on registration portal and also send the proof of remittance of fee as email to karthickrajan@nielitchennai.edu.in.
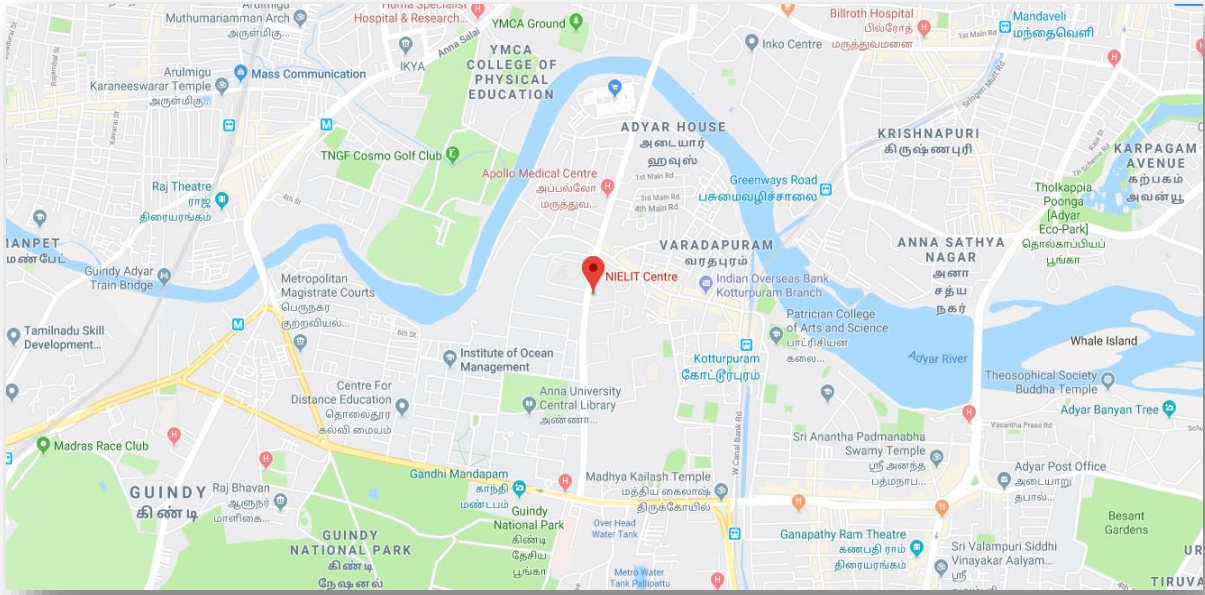
Admission: All provisionally selected candidates whose documents are verified and paid the fees (full or first instalment) and verified by accounts section of NIELIT Chennai will get a welcome message in his/her login ID provided during registration. The Credential and URL for online portal will be shared through WhatsApp or email.

Discontinuing the course:

- ✓ No fees (including the security deposit) under any circumstances, shall be refunded in the event of a student who have completed the process of admission or discontinuing the course in between. No certificate shall be issued for the classes attended. Only Grade Sheet will be issued.

- ✓ If candidates are not uploading assignments within assigned time their candidature will be cancelled without any notice and all fees paid will be forfeited.

- ✓ If candidates are not appearing for any internal examinations/practical their candidature will be cancelled without any notice and all fees paid will be forfeited

Course Timings: 1:30 PM to 5:30 PM (2 Hours Theory and 2 Hours Practical) (Monday to Friday)

Location: NIELIT Chennai is located at Gandhi Mandapam Road, Kotturpuram, Chennai (Landmark: Opp.To Anna Centenary Library).

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Address:

National of Electronics and Information Technology

ISTE Complex, No. 25, Gandhi Mandapam Road, Chennai – 600025

E-mail: trng.chennai@nielit.gov.in/Phone: 044-24421445

Contact Person: Mr. Ripunjay Singh,   Mobile: 9445220125 (Call @ 9 AM to 6 PM)

Course enquiries:

Students can enquire about the various courses either on telephone or by personal contact between 9.15 A.M. to 5.15 P.M. (Lunch time 1.00 pm to 1.30 pm) Monday to Friday.

Placement:

Students who have completed the course successfully and qualified, Placement guidance and career counselling will be given to crack their interviews.

Important Dates:

Last Date of Registration: 07-01-2022

Written Exam for Provisional Selection List: 11-01-2022

Display of Provisional Selection List: 12-01-2022

Payment of first instalment fee: 12-01-2022 to 15-01-2022

Course Start Date: 17-01-2022

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Examination & Certification:

✓ Certificates will be issued after successful completion of all the modules including assignment, seminar and project.

✓ For getting Certified Artificial Intelligence (AI) Associate, a candidate has to pass each module individually with minimum required marks of 50%.

Examination Scheme:

Examination scheme for each module is as follows:

Module Name	Total Marks	Written	Practical / Assignment
Python Programming	50	20	30
Statistical Concepts	25	10	15
Data Science and Analytics	75	30	45
Machine Learning	100	40	60
Deep Learning	100	40	60
Total	350	140	210

Grading Scheme:

✓ Following Grading Scheme (on the basis of total marks) will be followed:

Grade	S	A	B	C	D	Fail
Marks Range (in %)	>=85%	>=75% and <85%	>=65% and <75%	>=55% and <65%	>=50% and <55%	Below 50%

✓ Final Grading as per above grading scheme will be given on the basis of total marks obtained in all modules.

NSQF Examination Pattern:

Theory (Each Question will carry 1 mark) Duration (in Min): 90		Practical			Internal Assessment (Marks)	Project/ Presentation/ Assignment (Marks)	Major Project/ Dissertation		Total
Papers	Marks / Paper	Papers	Duration (in Min)	Marks/ Paper			No. Of Projects	Marks	
2	100	1	180	90	30	30	0	0	350

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Detailed Syllabus of the Course:

1) Python Programming

- ✓ An Introduction to Python
- ✓ Beginning Python Basics
- ✓ Python Program Flow
- ✓ Functions& Modules
- ✓ Exceptions Handling
- ✓ File Handling
- ✓ Classes in Python

2) Statistical Concepts

- ✓ Descriptive & Inferential Statistics,
- ✓ Probability Concept: Marginal, Joint & Conditional Probability, Bayes Theorem
- ✓ Probability Distributions,
- ✓ Hypothesis Test
- ✓ Entropy &Information Gain,
- ✓ Regression & Correlation,
- ✓ Confusion Matrix, Bias & Variance

3) Data Science and Analytics

- ✓ An Introduction to Data Science and Analytics
- ✓ Data Analysis Using NumPy
- ✓ Data Analysis Using Pandas
- ✓ Data Visualization – Pandas, Matplotlib, Seaborne, Plotly and Cufflinks

4) Machine Learning

- ✓ Introduction to Machine Learning
- ✓ Linear Regression
- ✓ Logistic Regression
- ✓ K-Means Clustering
- ✓ Decision Tree
- ✓ Random Forest
- ✓ K-Nearest Neighbours
- ✓ Support Vector Machine
- ✓ Naive Bayes
- ✓ Principal Component Analysis(PCA)
- ✓ Artificial Neural Networks(ANN)

5) Deep Learning

✓ Introduction to Deep Learning
✓ Artificial Neural Network -ANN
✓ Loss Function
✓ Bias & Gradient Descent
✓ Stochastic Gradient Descent
✓ Convolution Neural Networks -CNN
✓ Recurrent Neural Networks – RNNs
✓ Natural Language Processing-NLP
✓ Computer Vision using Opencv
✓ Deployment

Case Studies / Project Covered:

✓ Covid-19 data Analysis
✓ Data Pre-processing and Data Analysis for Banking Application
✓ Predictive Analysis for Housing Prices
✓ Kaggle's Titanic Survival
✓ Numerical Digit Image Classification using Regression Alogrithim
✓ Medical Diagnosis using ML (Diabetic and Cancer)
✓ Implementation of Spam filtering messages for Mails
✓ Hand Written Number Image Classification Using CNN
✓ Complex image recognition (CIFAR) using DL
✓ Creating Sine wave Signal using RNN
✓ Use Deep Learning for medical imaging