

**COURSE PROSPECTUS**

<b>Name of the Team:</b>	Control & Instrumentation
<b>Name of the Course:</b>	PG Diploma in Industrial Automation System Design
<b>Course Code:</b>	PC100 ( <i>Blended Mode</i> )
<b>Starting Date:</b>	28 <sup>th</sup> November 2022
<b>Duration:</b>	24 Weeks
<b>Course Coordinator:</b>	Shri. Arumugam J, <i>Scientist-D, Industrial Automation</i> Mob: 9080515215 / 9074681261 0495-2287266 - Ext 215/ 247 <a href="mailto:pc100@calicut.nielit.in">pc100@calicut.nielit.in</a>

**Preamble:** Stiff competition, higher quality standards and growing concerns of safety & environmental damage have pushed the Industrial sector to adapt state-of-the-art Automation Techniques for effective utilization of resources and optimized performance of the process plants. Automation applications span plant automation, discrete and batch process control, embedded machine control and manufacturing production line automation. Operational Technology (OT) refers to computing systems that are used to manage these industrial operations. Recent trends of integrating Information Technology (IT) & OT and merging of control systems associated with both factory and process automation demands knowledge from diverse fields. The industrial automation applications include automation of time critical systems that demand precise real time readings and control. Qualified automation engineers are needed to meet these requirements of designing appropriate automation systems. But, one need to have knowledge of diversified fields such as PC/ PLC based Control, Instrumentation, H/W, S/W, Networking, Industrial AC Drives, Machine Vision, DCS, SCADA/HMI, Industrial IoT (IIoT), High speed data acquisition, cRIO etc., to become a successful automation engineer.

**Objective of the Course:** This course is aimed at making an Engineer with appropriate experience; a qualified designer of Industrial automation systems with the use of PLCs, PACs, Industrial Field Instruments, Industrial PCs, SCADA/HMI, Industrial IoT (IIoT), Data-acquisition boards, Machine vision, cRIO, Microprocessor based instruments, and related Software. The course also includes an industrial oriented project work during which the student will be working on specific assignments of his/her choice.

**Outcome of the Course:** Qualified automation engineers to meet the requirements of designing appropriate industrial automation systems

## Expected Job Roles:

- Industrial Automation Engineer
- Project Engineer, Assistant Engineer
- Control & Instrumentation Engineer
- Instrumentation Engineer

## Course Structure:

Sl. No.	Module Title	Duration (Learning Hours)	Credits	
			Theory	Lab
1	Measurements with Industrial Field Instruments, Data Acquisition Systems (DAS), Process Plant Control & Automation System Design, Programmable Automation Controllers (PAC), Automation System Integration & Engineering Concepts	260	4	4
2	PLC & PID Controllers & Industrial Networking	160	3	3
3	SCADA/ HMI System Development	90	2	2
4	Distributed Control Systems (DCS)	90	2	2
5	Industrial Drives	80	1	1
6	Project Work	160	1	5
<b>Total Duration/Credits</b>		<b>840</b>	<b>30</b>	

## Other Contents

### I. Course Fees:

**a) General Candidates:** Course fee is Rs. 50,000/- + all taxes as applicable

**b) SC/ST Candidates:** Limited seats are reserved for SC/ST candidates as per *Govt. of India norms on merit basis*, and tuition fee is waived for these candidates.

However they are required to remit an amount of **Rs. 6,000/- 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 along with any other caution/security deposits by the student will be forfeited.

**II. Registration Fee:** An amount of Rs.1,000/- (*including all taxes as applicable & non-refundable*) should be paid at the time of registering for the course.

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.*

***For SC/ST candidates admitted under Govt. of India reservation quota norms, the registration fee is Rs.500/-*** and will be considered as part of caution/security deposit and will be refunded after successful completion of the course. If the candidate does not join or fails to complete the course the amount will be forfeited.

***For all other candidates the registration fee shall be Rs. 1000/-***

However above 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

[\*\*Click to Apply\*\*](#)

### III. Course Fee Installment Structure:

Fees	#1 Amount for General /OBC/ Others Candidates	#2 Amount for SC/STs Candidates	#3 Due Date
Registration Fee	Rs.1,000/-	Rs.500/-	During Registration
#4 <b>Advance fee</b> (For ONLINE part)	Rs.9,000/-	Rs. 5,500/-	On or before 28 <sup>th</sup> November 2022
1 <sup>st</sup> Installment	Rs.25,000/-	Nil	On or before 23 <sup>rd</sup> January 2023
2 <sup>nd</sup> Installment	Rs. 24,000/-	Nil	On or before 20 <sup>th</sup> March 2023
Total Fee	Rs. 59,000/-	Rs. 6,000/-	-

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

**#2** Considered as caution/security deposit, refundable after successful completion of course.

**#3** Fine will be applicable to late fee payment.

**#4 Advance fee (ONLINE part):** After online certificate verification NIELIT will send the email with details for provisional admission. After receiving the mail candidate should pay the advance fee and send the scanned copy of fee payment receipt to [pc100@calicut.nielit.in](mailto:pc100@calicut.nielit.in). The Original certificates/ other documents/ fee payment receipts should be shown at the time of attending OFFLINE / ON CAMPUS classes at NIELIT Calicut Centre on **23<sup>rd</sup> January 2023** and to pay the First Installment fee after original certificate verification.

#### IV. Mode of payment:

The advanced fee & course fee can be paid through any of the mode of payments specified in <http://nielit.gov.in/calicut/content/mode-payments-0>

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.

**All fee payments details should be forwarded to the Course Coordinator @ [pc100@calicut.nielit.in](mailto:pc100@calicut.nielit.in)**

#### IV. Eligibility:

BE /B.Tech in Electrical/ EEE/ Electronics/ Electronics & Communication / Instrumentation/ Applied Electronics and Instrumentation/ Instrumentation & Control/ Mechatronics / Chemical Engineering/ Computer Science.

Those candidates who have passed/will be passing all the semesters/year examinations of their qualifying degree on or before 05/05/2023 also may apply. **The PG Diploma certificates shall be issued to only those who produce the original or provisional degree certificate, the original mark lists and complete all the modules of PC100 program successfully as per the course requirements.**

#### V. Number of Seats : 50

(SC/ST candidates and Persons with disabilities are eligible for seat reservation as per Govt. of India norms)

#### VI. Selection of candidates:

Selection of candidates who have the requisite qualifying degree will be based on the *percentage of marks in their qualifying degree* subject to eligibility and availability of seats.

Selection of candidates who have completed the course but expecting the results shall be based on the aggregate percentage of marks mentioned in their final mark list and on the availability of seats. In case the aggregate percentage of marks is not given in the final mark list, the sum of marks from the first to last for all the semesters/ years shall be considered as the aggregate marks.

**The selection / Merit lists are prepared based on the details given by the applicant at the time of submitting the online application.**

The students who have **registered** and **paid the registration fee** must send the **scanned copy** of the following documents for online certificate verification to [pc100@calicut.nielit.in](mailto:pc100@calicut.nielit.in)

- 1) Proof of Qualifications (Degree/ Provisional / Course completion certificate and Mark sheets) and Address proof
- 2) Proof of Registration fee payment receipt
- 3) Passport size photograph
- 4) Govt. issued photo ID card (Aadhaar card preferred)
- 5) SC/ST Certificate (if applicable) in the standard format (Aadhaar mandatory for SC/ST candidates)

**VII. Provisional admission:** After online certificate verification, NIELIT will publish selection list on **22<sup>nd</sup> November 2022** on website. After paying the advance fee you will get the **TWO months ONLINE class link on or before 28<sup>th</sup> Nov 2022**.

*Please ensure that you have submitted scanned copies of authentic/ verifiable certificates as per the program eligibility criteria, before paying the advance fee.*

The provisional admission to the course will be confirmed after verifying the original certificates when the students come to NIELIT for attending the mandatory **THREE months ON CAMPUS** program. **Students must bring the originals of all documents for verification to confirm their admission to the course.**

The general guidelines for admission are given at:

<https://www.nielit.gov.in/sites/default/files/course/Course Prospectus Part B.pdf>

**VIII. Test/Interview :** *Not Applicable*

**IX. Counseling/Admission :** 28<sup>th</sup> November 2022 (Online part),  
23<sup>rd</sup> January 2023 (Offline part)

**X. Important Dates :**

Course Starting Date - Online mode	28 <sup>th</sup> November 2022
Last date to submit application form:	21 <sup>st</sup> November 2022
Selection intimation in website:	22 <sup>nd</sup> November 2022
Advance / Online part Fee payment	On or before 28 <sup>th</sup> November 2022
Starting - On Campus part	On 23 <sup>rd</sup> January 2023
1 <sup>st</sup> Installment fee payment	On or before 23 <sup>rd</sup> January 2023
2 <sup>nd</sup> Installment fee payment	On or before 20 <sup>th</sup> March 2023

## XI. Course Timings :

S.No	Mode of lecture	Starting Date/ Duration
1	<p><b>Online Mode</b> Class Timings 11:00 to 12:30 PM <i>Web link of recorded lectures of all major classes will be provided through our NIELIT Calicut LMS (Learning Management System)</i> <i>In case the candidate wants to discontinue after the <b>ONLINE</b> part he/she can opt for <u>online participation e-certificate for the completed topics.</u></i></p>	28 <sup>th</sup> Nov 2022 (8 Weeks)
2	<p><b>On Campus NIELIT Calicut</b> The classes and labs are from 9:30 AM to 12:30 PM and 2:00 PM to 5.25 PM - Monday to Friday  <i>(In case the candidate is NOT able to continue/ breaking the offline part in between, he/ she must complete the remaining part of the course in the <u>next TWO available batches</u> as and when NIELIT is offering this program by following the schedule/ fee structure of those batches)</i></p>	23 <sup>rd</sup> Jan 2023 (12 Weeks)
3	<p><b>** Project work</b> On campus / Industry / Internship/ from home</p>	17 <sup>th</sup> April 2023 (4 weeks)

\*\*Students can opt to do the project work at NIELIT campus/ Industry/ Company as internship / from home (online mode) as per their convenience.

**XII. Placement:** Usually students contact companies directly by sending resumes in response to job advertisements and get placed. Partial list of our past students, who joined various companies through their own competencies are given in [Annexure-I](#). It is observed that Industrial Automation companies generally prefer to recruit male candidates. The placement assistance provided is the following:

- We will be forwarding the collected resumes of students to companies, who approach us for their manpower requirements,
- We can provide recommendation letters to specific companies of your interest mentioning your performance (percentage of marks/ grades) in the course

## XIII. Lab Facilities:

### **Smart Field instruments with HART/ Foundation Fieldbus interface:**

- SMAR (LD301) - Pressure sensor & Transmitter (HART)
- SMAR - Foundation Field Bus Convertors (FI-302 & IF-302)
- ROSEMOUNT Differential pressure sensor & transmitter (HART)

- ROSEMOUNT - 3 Wire RTD transmitter (Foundation Fieldbus)
- ABB make Magnetic flow meter (HART)
- NOVUS make - Isolated Temperature transmitter
- Analog Isolators (PEPPERL – FUCHS & Siemens)
- USB HART FSK Modem

### ***PC based Data Acquisition Systems (DAS)***

- NI-LabVIEW 2020 Professional Development System (Academic License)
- NI-PXI System (NI PXIe-1701, NI PXIe-8100, PXI-6230)
- NI- USB 6002 DAQ system,
- NI-Multifunction DAQ Cards (PCI-6221 & 6250), SC-2075 & 2345
- NI Foundation Fieldbus Interfaces with software
- NI LabVIEW IMAQ Vision System & NI LabVIEW GPIB PCI Card

### **Industrial Controllers / PLC & PAC Systems:**

- Allen Bradley (AB) – SLC 500, Compact Logix 1769-L23E, RS-Logix 500 & 5000, RS-Linx, RS-Emulator & LogixPro Simulator.
- Siemens CPU -300 & 400, STEP-7, Siemens CPU-1200 & 1500 TIA v15.1
- Siemens IoT2040 platform and associated hardware
- ABB AC 500 PM 581 ETH, PM 573 & PM554-TP-ETH, Automation Builder 2.0
- NI Compact Field Point cFP-2100  
NI AIO-610, DIO-550, RLY-423 & PWM-520
- NI Compact RIO System and FPGA Module  
cRIO-9068 (NI 9201, NI 9219, NI 9481, NI 9422)  
cRIO-9045 (NI 9203, NI 9265, NI 9402, NI 9482)

### **SCADA / HMI systems:**

- Industrial Controllers with industrial Data Communication interfaces
- Modbus, PROFIBUS, PROFINET, FOUNDATION Fieldbus and DH 485.
- GE-Intellution-iFix6.5, Siemens WinCC Flexible and NI-LabVIEW DSC module with Hardware (RTUs & MTUs) and Siemens TP 177B panels.

### **Distributed Control System (DCS):**

- ABB make Freelance 800F with S800 I/O modules and interfaces
- PM 802F, SA811F, EI813F, FI830, FI840F & S800 I/O with Control Builder IT software.

### **Industrial Drives:**

- Allen Bradley (AB) – Power Flex 40
- ABB make ACS 550
- Stepper Motor Drive Module – PSA 6601 IMS200-221
- Siemens Servo Motor – V90 Drive rated output 400W – PN

*Process Automation Training Plant (Pilot plant) set up with real sized industrial instruments and controlled through PLC/ SCADA/ DCS/ PAC/ DAQ Systems (DAS)*

XIV. Course Contents : PC100 [Course Syllabus / Contents Link](#)

[For General Terms and Conditions – Applicable to all courses](#)

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