COURSE PROSPECTUS

Name of the Group: Control & Instrumentation
Name of the Course: Advanced Diploma-PLC/SCADA/DCS Engineer
Course Code: PC500
Starting Date: 27th May 2019
Duration: 16 Weeks (420 Hours)
Course Coordinator: Arumugam. J, Principal Technical Officer

9447445165, pc500@calicut.nielit.in

Preamble: Stiff competition, higher quality standards and growing concerns of safety & environmental damage have pushed the Industrial sector to adopt state-of-the-art Automation Techniques for effective utilization of resources and optimized performance of the process plants. Recent trend of merging control systems associated with both factory and process automation demands knowledge from diverse fields. Automation applications span plant automation, discrete and batch process control, embedded machine control and manufacturing production line automation. The industrial automation applications also include automation of time critical systems that demand precise real-time readings and control.

Objective of the Course: This course is aimed at equipping an Engineer/Diploma holder/M.Sc holder (in specific streams) with appropriate knowledge and skills required in configuring, programming and operating Industrial automation systems with the use of Industrial Field Instruments, PLCs, SCADA/ HMI and DCS.

Outcome of the Course: PLC/SCADA/DCS Engineers to meet the requirements of configuring, programming, installing and operating of industrial automation systems.

Course Structure:

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Modules</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC-501</td>
<td>Industrial Field Instrumentation, PLC and PID Controllers &amp; NI-LabVIEW</td>
<td>12 Weeks</td>
</tr>
<tr>
<td>PC-502</td>
<td>SCADA / HMI System Development</td>
<td>2 Weeks</td>
</tr>
<tr>
<td>PC-503</td>
<td>Distributed Control System (DCS)</td>
<td>2 Weeks</td>
</tr>
</tbody>
</table>
Other Contents

a. **Course Fees:**

- **General Candidates:** Course Fee is Rs. 39,000 + GST @ actuals.
- **SC/ST Candidates:** Tuition Fees/Examination fees are waived for SC/ST students admitted under SCSP/TSP. However they are required to remit an amount of Rs. 4,610/- 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.

b. **Registration Fee:** An amount of Rs.1000/- (Including GST, Nonrefundable) should be paid at the time of registering for the course.(Registration fee not applicable for SC/ST Students)

However above the registration fee shall be refunded on a few special cases as given below
   i. Student register and pay fee for more than one course and join for any one course, fee paid for remaining shall be refunded
   ii. Course postponed and new date is not convenient for the student
   iii. Course cancelled in advance, well before the admission date

c. **Course Fee Installment Structure:**

Students can pay the full fees of Rs. 46,020/- (Rs. 39,000/- + GST) in advance or as installments as given below.

<table>
<thead>
<tr>
<th>Fees</th>
<th>*Amount for General Candidates</th>
<th>#Amount for SC/ST Candidates</th>
<th>Due Date (on or before)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advance Fee</strong></td>
<td>Rs. 7,000</td>
<td>Rs. 4,610</td>
<td>23/05/2019</td>
</tr>
<tr>
<td>1\textsuperscript{st} Installment</td>
<td>Rs. 24,000</td>
<td>Nil</td>
<td>27/05/2019</td>
</tr>
<tr>
<td>2\textsuperscript{nd} Installment</td>
<td>Rs. 15,020</td>
<td>Nil</td>
<td>02/08/2019</td>
</tr>
</tbody>
</table>

* Above fees is inclusive GST @ actuals (18%) and revision if any will be applicable at the time of payment.

**Advance fee** - After publication of first selection list, the students in the first selection list has to pay the Advance Deposit within one week to take the provisional admission. Students in the additional selection should pay both Advance and First installment fee together on or before counseling day

# Refundable after successful completion of course (SC/ST Candidates)

Fine will be applicable to late fee payment as given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Fine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Late fee payment within two weeks after due date</td>
<td>18% (annually) of the outstanding dues</td>
</tr>
<tr>
<td>2</td>
<td>After second week of due date the candidate has to pay readmission fees along with the fine</td>
<td>Readmission fee Rs.250/- plus fine of 18% (annually) of the outstanding dues</td>
</tr>
<tr>
<td>3</td>
<td>The candidate has to discontinue the course after third week from the due date</td>
<td></td>
</tr>
</tbody>
</table>
d. **Eligibility:**
   - M.Sc in Electronics/ Instrumentation/ Industrial electronics.
   - Candidates not having qualifying degree (BE/BTech/MSc/Diploma) at the time of course completion at NIELIT shall be awarded "Certificate Course in - PLC/SCADA/DCS Engineer" by Course Coordinator/Training Officer in NIELIT letter head.
   - Advanced Diploma or Diploma certificate shall be awarded on the candidate producing the qualifying certificate at any later date, on production of the proof of passing the exam and on return of the provisional certificate issued earlier. (Refer NIELIT Calicut Policies on Short Term Courses. www.nielit.gov.in/calicut)

e. **Number of Seats:** 50
   - SC/ST candidates and Persons with disabilities are eligible for seat reservation as per existing rules.

f. **How to Apply:**
   - Students are advised to apply online [http://nielit.gov.in/content/online-registration](http://nielit.gov.in/content/online-registration).
   - Payment towards nonrefundable registration fee of Rs.1,000/- (Not applicable for SC/ST students) may be paid through online payment gateway available in the Registration page or through any of the mode of payments specified in [http://nielit.gov.in/calicut/content/mode-payments-0](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.

g. **Selection of candidates:**
   - Selection of candidates who have the requisite eligibility will be based on the percentage of marks in their qualifying examination subject to the 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 lists are prepared based on the details given by the applicant at the time of submitting the application. All the admissions will be confirmed only after verifying the original certificates on the date of counseling (27/05/2019) and also after making the payment of course fee as applicable.
The admission to the course shall be based on the following criteria:
The applicants should have the requisite eligibility criteria as mentioned under the heading “Eligibility”. Selection list of students will be prepared and published in our website as follows.

First selection list:
First selection list will be prepared based on the applications received on or before 13th May 2019. The first selection list of applicants will be finalized and published at our website on 14th May 2019.
The students have to verify their selection from our website. No separate call letters will be sending to the students for admission.

Additional selection list:
The additional selection list of students will be finalized and published in our website on 23rd May 2019 @ 5:00 PM, based on the vacancy that arises from the first selection list.
The students in the additional list have to come directly to the center on the date of counseling for admission. Their admission shall be confirmed only after verifying their original certificates/ mark lists and after payment of the first installment of fees/security deposit as applicable on the counseling date.

h. Counseling/Admission: 27th May 2019 - 10:00 am, @ NIELIT Calicut.

i. Spot Admission: Unfilled/vacant seats are filled through spot admission. Spot admission (if open) will close within 15 days of Counseling/Admission of a particular course. On spot admission students should provide an undertaking saying that he/she is fully aware that he/she missed so much days of class and will not ask for extra classes or further extension of course.

j. Admission Procedure:
Students who have been selected for test/interview/counseling/admission are required to report to the Institute on the prescribed day by 9:30 am along with the following

1. Original and attested Copies of Proof of Age, Qualification, Mark Lists.
2. Two passport size photograph. (For application/identity card)
3. SC/ST Certificate in English/Hindi (Original and Two attested copies)
4. Govt. issued photo ID card (Aadhaar mandatory for SC/ST candidates. Original and one copy)

k. Discontinuing the course:
No fees (including the caution deposit) under any circumstances, shall be refunded in the event of a student discontinuing the course. No certificate shall be issued for the classes attended.
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l. **Course Timings:**
   The classes and labs are from 9:30 AM to 12:40 PM and 2:00 PM to 4:00 PM, Monday to Friday.

m. **Location and how to reach:**
   NIELIT Calicut is located very close to NIT Calicut campus and is about 22Kms from the Calicut (Kozhikode) city. A number of buses (Buses to NIT via Kunnamangalam) are available from "Palayam Bus Stand and KSRTC Bus Stand". The bus stop at our Institute is called "Panthrand" and is one stop before NIT. The bus fare is around Rs.19/- from Calicut (Kozhikode) City to NIELIT. Calicut (Kozhikode) is well connected by Rail, Road and Air from different parts of the country. The maximum and minimum temperatures range between 35°C and 20°C.

n. **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 1.00 pm to 1.30 pm).

<table>
<thead>
<tr>
<th>Telephone Numbers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC-500 Course Coordinator 0495 – 2287266 Extn. 247 +91 9447445165</td>
</tr>
<tr>
<td>Training Officer 0495 - 2287266/ +91 9446011266</td>
</tr>
<tr>
<td>Office Fax 0495 - 2287168</td>
</tr>
<tr>
<td>E-mail (Training Officer): <a href="mailto:trng@calicut.nielit.in">trng@calicut.nielit.in</a></td>
</tr>
<tr>
<td>E-mail (PC500-Coordinator): <a href="mailto:pc500@calicut.nielit.in">pc500@calicut.nielit.in</a></td>
</tr>
<tr>
<td>Website: <a href="http://nielit.gov.in/calicut">http://nielit.gov.in/calicut</a></td>
</tr>
</tbody>
</table>

o. **Important Dates:**

<p>| Last date for receiving completed application forms (for First selection list) | 13th May 2019 |
| Publication of First selection list in our website (Candidates must verify their selection from our web site only) | 14th May 2019 (No other individual intimation will be send to the candidates separately) |
| Last date for taking provisional admission by paying the Advance fees/security deposit for applicants in the First selection list Rs. 7,000 /-(For General Candidates) Rs. 4,610 /-(For SC/ST [Security Deposit]) | 23rd May 2019 |</p>
<table>
<thead>
<tr>
<th>Publication of <strong>Additional selection list</strong> in our website (Against vacancies arising from first selection list)</th>
<th><strong>23rd May 2019 @ 5:00 PM</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling /Admission Date</td>
<td><strong>27th May 2019</strong></td>
</tr>
<tr>
<td>Payment of First Installment of Fees for applicants in the <strong>First Selection list.</strong></td>
<td><strong>On or before 27th May 2019</strong></td>
</tr>
<tr>
<td>Payment of Advance fee &amp; First installment fees/ Security deposit for applicants in <strong>Additional selection list</strong>&lt;br&gt;<strong>Rs. 31,000 /-</strong> (For General Candidates)&lt;br&gt;<strong>Rs. 4,610 /-</strong> (For SC/ST [Security Deposit])</td>
<td><strong>27th May 2019</strong></td>
</tr>
<tr>
<td>Course commencement Date</td>
<td><strong>28th May 2019</strong></td>
</tr>
<tr>
<td>Payment of <strong>Second installment fees</strong> <em>(Rs. 15,020/-)</em></td>
<td><strong>On or before 02nd August 2019</strong></td>
</tr>
</tbody>
</table>

p. **Placement:**
Usually students contact companies directly by sending resumes in response to job advertisements and get placed. 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.

q. **Hostel facilities :**
Hostel accommodation is available for boys and girls on monthly or daily chargeable basis. The hostel fee varies from Rs.1,400 /- to Rs.1,500/- per month depending on the type of accommodation. However, students are required to pay the hostel fees for the entire duration of the course for which they are seeking admission at the time of joining the course itself.

r. **Boarding facilities :**
Canteen & Mess facility is available for both boys & girls, students, those who avail mess facility should pay monthly mess fee @ Rs. 135/-* per Day. An amount of Rs. 1,000/- should be paid as mess advance to the Canteen Contractor at the time of joining the mess which will be adjusted in the last month mess fee.
*as per the present rate of contract agreement*

An amount of Rs.3,000/- should be paid as caution deposit (hostel & mess) at the time of joining the hostel which will be refunded/adjusted at the end of the course. For students not availing hostel facility, Rs.1,000/- will be the caution deposit.

s. **Lab Facilities**

Industrial process controllers & Field instruments
- PLCs (Allen Bradley, SIEMENS & ABB), SOFTPLC
- Intellution iFIX SCADA, NI LabVIEW SCADA module & SCADA Hardware
- Distributed Control Systems (DCS) - ABB Freelance 800F
- FOUNDATION Fieldbus, Profibus, DH 485, HART based Devices
- NI LabVIEW Professional Development System
- NI LabVIEW GPIB and Foundation Fieldbus Interface
- NI LabVIEW IMAQ Vision System and FPGA Module
- Image inspection system
- Data acquisition systems with PCI, Ethernet Fieldpoint I/O and NI Compact RIO
- Programmable Automation Controller (PAC)
- Smart Instruments with HART/ Foundation Fieldbus interfaces
- Training Plants set up with real sized industrial instruments and controlled through PLC/PAC/LabVIEW/SCADA/DCS
- Industrial Robots (Scorbot ER – VII, Mitsubishi RV – M1)
- AB power flex 40 and ABB ACS550 AC drives
- ABB DCS800 DC drive, Labvolt AC and DC drive trainers

**Course Contents :**

**PC-501: Industrial Field Instrumentation, PLC and PID Controllers & NI-LabVIEW**

- Sensors / Transducer
- Measuring Temperature with Thermocouple & RTD
- Measurement using Bridge circuit
- Flow, Pressure, Force & Strain measurement using Strain gage
- Transmitter
- Control Valve
- Programmable Logic Controllers Basics
  - Hardware/Software introduction & Instruction sets
- Programming of PLC using IEC 1131-3 Languages (LD, FBD etc.)
- Detailed functions of Digital and Analog IO modules.
- Branded PLCs interface with plant Digital IOs & Analog Sensors/Actuators
  - AllenBradly
    - SLC-500 with RS-Logix 500, Emulate 500 & LogixPro Simulator
    - Compact Logix with RS-Logix 5000
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- ABB – AC 500 Controllers (PM 581-ETH) with 3S CoDeSys Software
- Siemens CPU 300 Controllers with SIMATIC STEP 7 Software
- Fundamental process control techniques,
- Implementing PID algorithm using above mentioned Controllers
- Using smart module and control stepper motor.
- Comparison of different brands of PLCs
- Introduction to Measurement and Automation Software LabVIEW
- Graphical programming for data acquisition & Control
- Signal processing, analysis & presentation using LabVIEW

PC-502: SCADA / HMI System Development
- Introduction to Industrial Networking and RS 232-422-423-485 standards
- Industrial field buses
  - MODBUS – Serial /TCP-IP
  - PROFIBUS-DP
  - HART
- Introduction to SCADA and SCADA / HMI Components
- Intellution iFIX SCADA Software
- HMI Development, Data Processing, Control Algorithm Programming
- Data Acquisition PLCs/RTUs, Database Connectivity and Report generating.
- OPC (OLE for Process Control) Configuration with RTUs (PLC)
- NI LabVIEW DSC (Data logging and Supervisory Control module) Software.

PC-503: Distributed Control System (DCS)
- Introduction to DCS and Compare with SCADA system
- Introduction to ABB 800F DCS with Control Builder IT software
- Hardware Configuration of ABB 800F (PM 802F) (process station – PS).
- Developing a project and control the plant through field bus (Profibus, FF).
- Monitoring & controlling the plant using DigiVI-visualization software (operator station- OS)

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