SARVAJANIK UNIVERSITY
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Sarvajanik University
Sarvajanik College of Engineering & Technology
(Constituent institute)
Dr R.K. Desai Road, Athwalines, Surat - 395001

Department of Instrumentation & Control Engineering

CERTIFICATE COURSE
ON
I. INDUSTRIAL AUTOMATION II. ADVANCE AUTOMATION

About Course:

In today's scenario when we talk about upgradation of technology and automation, our manpower must be well learned or trained to adopt the newer technology so that solution of the problems of new technology can be provided in house. The main objective of the course is to provide theoretical as well as practical knowledge on the application of instruments and some advances in the field of Instrumentation & Control.

Courses Offered:

(A) Course 01 Industrial Automation (14 weeks)
(B) Course 02 Advance Automation (06 weeks)

Venue: Department of Instrumentation & Control Engineering
Sarvajanik College of Engg. & Tech., SURAT.

Course	Commencing Date	Fees	Total Theory Hrs	Total Lab. Hrs
Course 01	03/02/2021	Rs. 10000/-	72	40
Course 02	08/03/2021	Rs. 5400/-	24	24

Courses will be conducted on Every Thursday & Friday from 4:00 p.m. to 8:00 p.m.

A person desired to know Automation is eligible for these courses
Appropriate study material & certificate will be provided to the participants.

Important Dates

Industrial Automation (14 weeks)	Last date of Registration: **21st January 2022** Date of Confirmation of registration: **28th January, 2022** Course commence from: **3rd February, 2022**
Advance Automation (06 weeks)	Last date of Registration: **25th February, 2022** Date of Confirmation of registration: **01st March, 2022** Course commence from: **8th March , 2022**

Eligibility Criteria

(i) Technicians and maintenance persons having with some experience in the field of Electrical/Electronics/Instrumentation/Chemical/Mechanical.
(ii) Fresher Engineers
(iii) Diploma Holders (fresh or experience) of any field.
(iv) Instrument trainees

Certificate

At the end of the course, test will be taken for the both courses separately. The performance is indicated in the certificate. The certificate will be issued by the I.C. Dept. , SCET / Saravajanik University.

Place of Conduction of the course

Department of Instrumentation & Control Engineering.
Sarvajanik College of Engineering & Technology,
Dr. R.K. Desai Marg, Opp. Mission Hospital,
Athwalines, Surat.

Contact Address:
Prof. U. T. Pandya
HOD & Course Coordinator (Instrumentation & Control Engg)
Department of Instrumentation & Control Engineering
Sarvajanik College of Engineering & Technology
Dr. R. K. Desai Marg, Athwalines, Surat
Ph. (0261) 2240145/146/147 EXT. 42
Mobile- 94264 46384
E-mail: utpal.pandya@scet.ac.in

(For Detailed information regarding Course Content and Registration Form please contact to above address or visit www.scet.ac.in)

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Department of Instrumentation & Control Engineering

CERTIFICATE COURSE

ON

INDUSTRIAL AUTOMATION

Main Objective

In today's scenario when we talk about upgradation of technology and automation, our manpower must be well learned or trained to adopt the newer technology so that solution of the problems of new technology can be provided in house.

Many dyeing houses, small-scale industries are moving towards automation to improve and increase production and to reduce the energy cost. The main objective of the course is to provide theoretical as well as practical knowledge on the application of instruments and some advances in the field of Instrumentation & Control.

Course structure

I Industrial Automation - Duration: 14 weeks - Total hours: 112

This course is divided in the following subjects:

Sr. No.	Name of Subjects	Total Theory Hours	Total Practical Hours
1.	Measurement Techniques	37	20
2.	Instrumentation Systems	35	20
	TOTAL	**72**	**40**

Duration

-Duration of the course will be 14 weeks.
-Per week 5 lecturers & 3 hours lab. Sessions.
-Theory and Practical sessions will be scheduled on Thursday & Friday of the week from 4:00 p.m. to 8:00 p.m.

Fees

Course Registration fee for the participants is Rs 10000/- (non-refundable) Registration after the due date is made at Rs. 11000/-(non-refundable)
Payments should be made through DD/Cheque drawn in favor of **"Principal, S.C.E.T"** payable at Surat.

The course fee includes the cost of material, certificates, CDs, etc.

Important Dates

Last date of Registration: **21st January 2022**
Date of Confirmation of registration: **28th January, 2022**
Course commence from: **3rd February, 2022**

Eligibility Criteria

(v) Technicians and maintenance persons having with some experience in the field of Electrical/Electronics/Instrumentation/Chemical/Mechanical.
(vi) Fresher Engineers
(vii) Diploma Holders (fresh or experience) of any field.
(viii) Instrument trainees

Certificate

At the end of the course, test will be taken for the both courses separately. The performance is indicated in the certificate. The certificate will be issued by the I.C. Dept., SCET / Saravajanik University.

Place of Conduction of the course
Department of Instrumentation & Control Engineering.
Sarvajanik College of Engineering & Technology,
Dr. R.K. Desai Marg, Opp. Mission Hospital,
Athwalines, Surat.

Contact person: Prof. Utpal Pandya (Course coordinator)
HOD - I &C Engg., SCET-SURAT
Ph.- 0261-2240145/146/147
Mobile- 9426446384
E-mail:- utpal.pandya@scet.ac.in

APPLIED INSTRUMENTATION

IA – 01 Measurement Techniques

(Theory Hrs. – 37)

1. Temperature Measurement: Basic principle, selection, installation & calibration	**Lectures (07)**
• Thermocouples	02
• Resistance Temperature Detectors	02
• Filled Systems	01
• Thermistors	01
• Pyrometers (Radiation & Optical type)	01

2. Pressure Measurement: Basic principle, selection, installation & calibration	**Lectures (08)**
• Manometers (Different types)	01
• Bourden Tubes	01
• Bellows & Diaphragm	01
• Piezo electric	01
• Strain Gage	01
• Thermal Conductivity	01
• Dead Weight Tester	01
• Pressure switches	01

3. Level Measurement: Basic principle, selection, installation & calibration	**Lectures (08)**
• Float Type	01
• Dry & Wet leg Design	01
• Capacitance Level Sensor	02
• Ultrasonic & Nuclear Radiation Type	02
• Level Switches	02

4. Flow Measurement: Basic principle, selection, installation & calibration of Sensors	**Lectures (11)**
• Differential Pressure Type: Orifice, Venturi Meter, Pitot Tubes	02
• Mechanical Flow meters: Positive Displacement Type, Turbine, Other Rotary Flow Meters	03
• Electronic Flow Meters: Magnetic Flow Meter, Ultrasonic Flow Meter. Vortex Flow Meter	03
• Mass Flow Meters: Corriolis, Thermal, Hot Wire & Hot Film Anemometers	03

5. Displacement Measurement: Basic principle, selection, installation & calibration of Sensors	**Lectures (3)**
• Encoder, Tachometer	01
• Resistive, Inductive, Eddy, LVDT & Flapper-Nozzle	02

LIST OF HANDS ON / PRACTICALS

IA – 01 Measurement Techniques

(Practical Hrs. – 20)

S. N.	Hands on / Practical List	Hours (20)
1	Rotameter- Flow	02
2	Manometer- Pressure	02
3	Hg-filled system-temperature gauge Bimetallic thermometer	02
4	Study of different types of thermocouple	02
5	Thermistors	02
6	RTD, 2 wires, 3 wires	02
7	Bourden tube type pressure gauge	02
8	LVDT, Tachometer	02
9	Strain gauge	02
10	Study of calibration instruments - Universal calibrator - Mv/mA source meter - Temperature bath - Dead weigh tester - RTD/Thermocouple simulator	02

LIST OF HANDS ON / PRACTICALS

IA – 02 Instrumentation Systems

(Theory Hrs.-35)

TOPICS	Lectures (03)
1. System Characteristics - Static, Dynamic, Measurement Standards	**03**
2. Instrumentation Symbols and Identification - P & I Diagram, Loop Wiring Diagram and Special drawing	**03**
3. Controllers • Concept of open loop, closed loop, feed back, feed forward, cascade, ratio control etc.. • Controller Modes: P, I, D, PI, PID. • Controller Specification and Selection • Tuning Method	**07** 02 02 1.5 1.5
4. Control Valves • Types, Characteristics, rangebility, Cv • Actuators • Positioners • Accessories • Testing Procedures	**07** 03 01 01 01 01
5. Converters • V to F, F to v, V to I, I to V, P to I, I to P • Transmission Systems	**03**
6. Instrument Air systems Air Supply Systems, Design, Sizing Criteria, Compressors, Dryers and Distribution systems	**03**
7. Control Rooms & Control Panels Room Lay out, Types of Control Panels, Piping, Tubing & Wiring	**03**
8. Indicators, Recorders & Annunciators Indicators-Types, Recorders-Types, and Annunciators	**02**
9. Safety & Protection Methods Hazardous area classification and Protection methods	**04**

LIST OF HANDS ON/ PRACTICALS

IA – 02 Instrumentation Systems

(Practical Hrs. – 20)

S.N.	Hands on / Practical list	Hours (20)
1	Configuration Process of single loop controller controller make “Masibus”, “ Yokogawa”	02
2	Evalauation of various control action like on-off, P, I, D, PI, PD, PID etc	02
3	Converters I/P, P/I, V/I, I/V	02
4	Study of different valve characteristics	02
5	Study of indicator, Recorders & alarm communication	02
6	Study of ‘SCET’ instrumentation air system	02
7	Study of different control panel and their layout	02
8	Design of temperature loop with the help of given loop indicator	02
9	Designing of level control loop	02
10	Designing of pressure control loop	02

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CERTIFICATE COURSE

ON

ADVANCE AUTOMATION

Main Objective

In today's scenario when we talk about upgradation of technology and automation, our manpower must be well learned or trained to adopt the newer technology so that solution of the problems of new technology can be provided in house.

Many dyeing houses, small-scale industries are moving towards automation to improve and increase production and to reduce the energy cost. The main objective of the course is to provide theoretical as well as practical knowledge on the application of instruments and some advances in the field of Instrumentation & Control.

Course II on "**Advance Automation**" **(Duration: 6 weeks)**

Sr. No.	Name of Subject	Total Theory Hours	Total Practical Hours
1.	Advance Automation	24	24

Duration

-Duration of the course will be 06 weeks.
-Per week 5 lecturers & 3 hours lab. Sessions.
-Theory and Practical sessions will be scheduled on Thursday & Friday of the week from 4:00 p.m. to 8:00 p.m.

Fees

Course Registration fee for the participants is Rs 5400/- (non-refundable) Registration after the due date is made at Rs. 6400/-(non-refundable)
Payments should be made through DD/Cheque drawn in favor of
"Principal, S.C.E.T" payable at Surat.

Important Dates

Last date of Registration: **25th February, 2022**
Date of Confirmation of registration: **01st March, 2022**
Course commence from: **8th March , 2022**

Eligibility Criteria

i. Technicians and maintenance persons having with some experience in the field of Electrical/ Electronics/ Instrumentation/ Chemical/ Mechanical.
ii. Engineers other than instrumentation.
iii. Diploma Holders (fresh or experience) of any field.
iv. Instrument trainees.

Certificate

At the end of the course, test will be taken for the both courses separately. The performance is indicated in the certificate. The certificate will be issued by the I.C. Dept. , SCET / Saravajanik University.

Place of Conduction of the Course

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Dr. R.K. Desai Marg, Opp. Mission Hospital,
Athwalines, Surat.

Contact person: Prof. Utpal Pandya (Course coordinator)
HOD - I &C Engg., SCET-SURAT
Ph.- 0261-2240145/146/147
Mobile- 9426446384
E-mail:- utpal.pandya@scet.ac.in

ADVANCE INSTRUMENTATION (THEORY: 24 Hrs.)

Sr. No	Name of Topic	Hours
1	**Programmable logic controller and it's applications** • Hardware options • Programming languages • Applications of PLC	**(08)** 03 03 02
2	**SCADA Systems** • Analog I/O functionally - Resolution and - Analog to digital - Digital to analog • Digital I/O functionally - DI, DO, Push I/O • Analog signal transmission - Analog signal types - Noise & grounding - Wire and cable options • Digital signal transmission - The OSI N/W Model - Physical layer options - N/W Topologies - Field bus and Device N/W • Data Acquisition Hardware - Plug- in- Cards - I/O modules - Smart Transmitter, RTDs, etc • Software options • Application of SCADA •	**(10)** 01 01 01 03 02 01 01
3	**Distributed Control Systems** • Historical Development • Basic concepts • Hierarchy • Cost estimation • Interfacing of PLC to DCS & PC to DCS • Problem and Trouble shouting	**(06)** 01 02 01 01 01

LIST OF PRACTICALS - ADAVANCE INSTRUMENTATION (24 HRS.)

S.N.	Aim of Practical	Hours (24)
1	Study of different types of I/O modules of Siemens PLC	02
2	Study of PLC applications through simulation	04
3	Develop Ladder diagram for given two applications	06
4	Study of PC based control system using Plug-in-cards	02
5	Designing of PC based SCADA system using I/O module (I) Designing of Graphics (II) Implementation	06
6	Demonstration of other software like - Lab view, etc. - Different display types available - MAT Lab Simulink instruction - HMI interfacing	04

REGISTRATION FORM FOR THE CERTIFICATE COURSE

Personal Details

Course Name: _____

Name: _____

Gender: _____

Designation: _____

Address: _____

_____

_____

Telephone (R): _____

(O): _____

E-mail ID: _____

Organization Details (If applicable)

Name: _____

Address: _____

_____

_____

Telephone: _____

Fax: _____

Signature of participants

Signature of head of Institute

Payment Details:

Amount: _____

DD/ Cheque no.:_____ Date: _____

Drawn on: _____

Date: