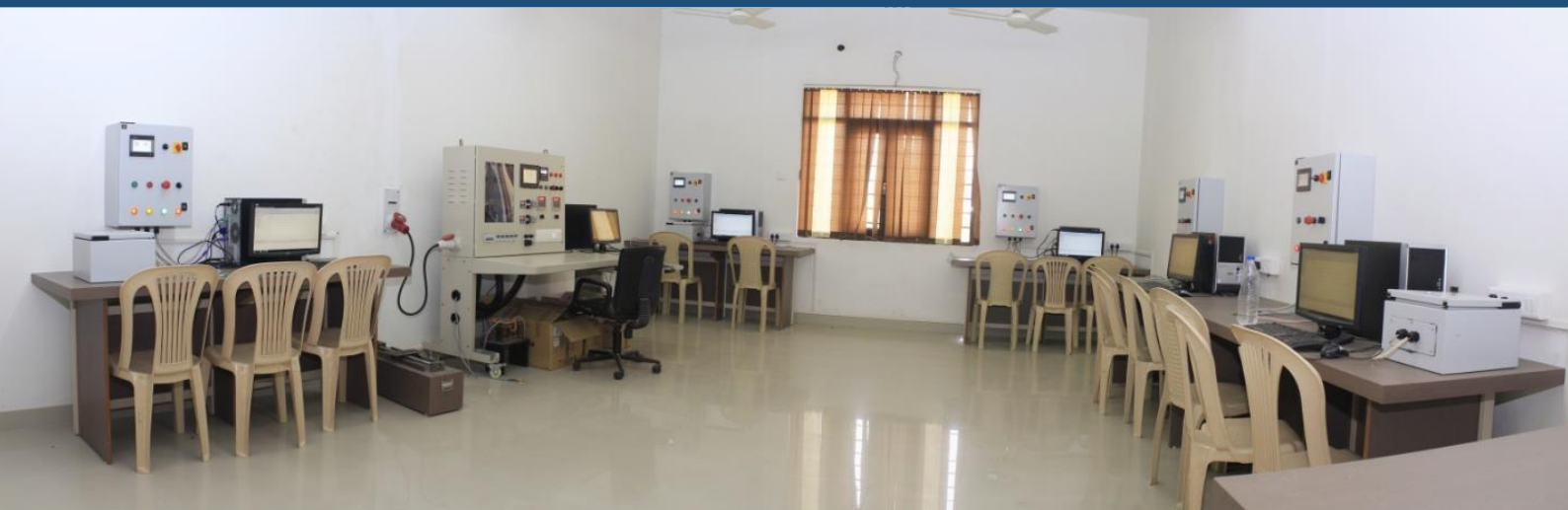A Report

On

Faculty Development Program

(FDP)

25th - 30th November, 2019

Industrial Automation and Industry 4.0

Sponsored by
Gujarat Technological University (GTU)

Approved by
Indian Society for Technical Education (ISTE)

Organized by
Department of Electrical Engineering
Department of Electronics & Communication
Darshan Institute of Engineering & Technology

Contents

1. About the Institute

Darshan Institute of Engineering & Technology established in year 2009 by Shree G. N. Patel Education & Charitable Trust, is recognized by All India Council for Technical Education (AICTE) New Delhi and affiliated to Gujarat Technological University (GTU). The Institute is proud to have team of dedicated faculties and is committed to give world–class infrastructure and educational environment so that students can reach their full potential in their chosen discipline as well as an individual. Presently institute offers graduate and post graduate programs in disciplines of Civil, Mechanical, Computer, Electronics & Communication, and Electrical Engineering.

2. About the Departments

Department of Electrical Engineering and Department of Electronics & Communication Engineering currently offers intake of 60 undergraduate and 18 postgraduate students. Departments have state-of-the-art infrastructure and a team of qualified, experienced and industry linked faculties.

Energy Management Cell (EMC), as an independent unit, that offers services and solutions in key areas of Energy Audit, Power Quality Audit, Electrical Safety Audit, Thermography, Solar Power Plant EPC and other consultancy services. The Department holds seven licenses/approvals from State and Central Government and has successfully completed 850+ consultancies and collaborative projects with Government and private organizations and industries. In past few years the Department has received project grant of Rs. 45+ lac from Government agencies like GEDA, PPDC, NSDC, AICTE, etc.

Center for Advance Training in Industrial Automation (CAT-IA) has been set-up at Department of Electronics & Communication in consultation with Delta Electronics India Pvt. Ltd. and other leading solution providers in area of industrial automation. The center is equipped with industrial grade experimental setups on PLC, HMI, SCADA, VFD, Servo & Stepper drives, analog and digital sensors, actuators, etc. Various courses, from basic to advance level, are offered at the center. The center also serves the needs of industrial and research projects taken up by faculties at the Institute in collaboration with industries.

3. Objective of the Faculty Development Program

Industrial Automation is one of the most actively pursued and in-demand research areas. This is primarily due to its wide proliferation in diverse areas of application. Objective of the program is to educate the participants in the field of Industrial automation from the level of introduction to application. This has involved study and use of PLC, HMI & Motor Drives in contemporary automation technologies and related applications. All sessions are intended to be hands-on to enable learning through hardware-in-loop simulations and experimentations. Industry experts and experts within and outside institute has addressed participants. This program has ignited the minds to further pursue research and development in the field of Industrial automation.

The program is intended for faculties from Electrical, Electronics & Communication, Mechanical, Mechatronics and Instrumentation & Control Engineering

4. Steering Committee of the Faculty Development Program

Patron

Dr. R. G. Dhamsaniya	Prof. M. V. Sanghani
Principal	Principal
Darshan Institute of Engineering & Technology	Darshan Institute of Engineering & Technology for Diploma Studies

Advisory Committee

Prof. K. M. Bhavsar	Prof. Nukul Patel
Chairman, ISTE Gujarat Section	Hon. Secretary ISTE Gujarat Section

Convener

Dr. D. D. Vyas
Professor & Head
Department of Electronics & Communication Engineering

Core Committee

Prof. M. N. Popat	Prof. S. M. Patel
Associate Professor	Associate Professor
Department of Electronics & Communication	Department of Electrical Engineering

Faculty Program Co-ordinators

Prof. H. K. Lakhani	Prof. V. B. Doshi
Assistant Professor	Assistant Professor
Department of Electrical Engineering	Department of Electrical Engineering

5. Participation details of the Faculty Development Program

The course is open for faculty members of GTU affiliated Degree and Diploma institutes having ISTE life membership or willing to be ISTE members. The program is oriented to be majorly hand-on hence the seats are limited to 30. Preference was be on first come basis.

Participants from Various Engineering Colleges	11
Participants from In-house Institute	17
Total Participants	**28**

6. Eminent Experts for Faculty Development Program

Expert	Topic
Dr. Hiren G. Patel Associate Professor Department of Electrical Engineering Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, Gujarat	1. Introduction to Industrial Automation 2. Introduction to PLC programming
Mr. Kuldeep M. Vyas Project Head, Automation Division Inter Care Solutions Pvt. Ltd., Rajkot, Gujarat	Hands-on Session: Delta PLC programming using WPLSoft and programming for Digital I/O
Dr. Dhaval R. Bhojani Assistant Professor Department of Electronics & Communication Government Engineering College, Rajkot, Gujarat	Hands-on Session: 1. Delta HMI programming using DOPSoft 2. Application programs with PLC and HMI 3. PLC programming for Analog I/O 4. PLC programming for VFD 5. PLC programming for stepper motor and drive 6. PLC programming for servo motor and drive
Ms. Madhavi Wadurkar Sr. Manager-Engineering Drives and Automation Department Bharat Bijlee Ltd., Mumbai, Maharashtra	1. Introduction to advance product range and approaches in Industrial Automation. 2. Case study of Automation Projects
Prof. Anil D. Kansagara Assistant Professor Department of Electrical Engineering Darshan Institute of Engineering & Technology, Rajkot, Gujarat	Hands-on Session: 1. Demonstration of advance automatic system for Motor and pump testing
Prof. Vicky B. Doshi Assistant Professor Department of Electrical Engineering Darshan Institute of Engineering & Technology, Rajkot, Gujarat	

Dr. Divyang D. Vyas Head & Professor Department of Electronic & Communication Darshan Institute of Engineering & Technology, Rajkot, Gujarat	Industry 4.0 - concept, architecture, scope and challenges
Prof. Vimal G. Limbasiya Assistant Professor Department of Mechanical Engineering Darshan Institute of Engineering & Technology, Rajkot, Gujarat	Introduction to Additive Manufacturing (3D printing) and its role in Industry 4.0
Mr. Kishan K. Govani Design Engineer Autobits Labs Pvt. Ltd., Rajkot, Gujarat Mr. Parth Kaneriya Design Engineer Autobits Labs Pvt. Ltd., Rajkot, Gujarat	Hands-on Session: Introduction to industrial gateways and demonstration of IR 4.0 based application using it.
Mr. Tejas Prajapati Project Head Industrial Automation Division Lubi Electronics, Ahmedabad, Gujarat Mr. Kishan Patel CEO Patson Enterprise, Rajkot, Gujarat	1. Future trends in Industrial Automation. 2. Case study of Automation Projects
Prof. Rakesh D. Oza Associate Professor & Mentor UHV Department of Electronics & Communication Atmiya University, Rajkot, Gujarat	Universal Human Values

7. Schedule of the Faculty Development Program

DAY 1 (25/11/2019)		
09:00 – 09:30	----	Welcome and Registration
09:30 – 10:00	----	Inauguration Function
10:00 – 11:00	Dr. Hiren G. Patel	Introduction to Industrial Automation • Industrial Automation - overview • PLC basics
11:00 – 11:15	**Tea Break**	
11:15 – 01:15	Dr. Hiren G. Patel	PLC Programming • Introduction to PLC programming • Introduction to Programming tools, simulators • Basic programming examples of I/O, timers, counters, etc.
01:15 –02:00	**Lunch**	
02:00 – 04:00	Mr. Kuldeep M. Vyas	Hands–on: PLC programming – Digital I/O, Timers, Counters, etc. • Introduction to trainer modules – components and wiring diagram • Introduction to programming software • Programming examples • Application development
DAY 2 (26/11/2019)		
09:00 – 11:00	Dr. Dhaval R. Bhojani	Hands–on : Introduction to HMI • Introduction to HMI and its features • Introduction to programming software for HMI • Programming examples on HMI
11:00 – 11:15	**Tea Break**	
11:15 – 01:15	Dr. Dhaval R. Bhojani	Hands–on: PLC and HMI programming. • Programming examples on PLC and HMI • Macro programming, recipe, etc. • Application development

01:15 –02:00	Lunch	
02:00 – 04:00	Dr. Divyang D. Vyas	Hands–on : PLC and HMI programming - Analog I/O • Introduction to Analog I/O extension module and its use • Interfacing of Thermocouple/RTD with PLC and its programming.
DAY 3 (27/11/2019)		
09:00 – 11:00	Dr. Dhaval R. Bhojani	Hands–on : Introduction to VFD and programming • Introduction to VFD and its operating modes • Introduction to parameter setting of VFD • VFD programming with PLC
11:00 – 11:15	Tea Break	
11:15 – 1:15	Dr. Dhaval R. Bhojani	Hands–on : Introduction to rotary encoder , stepper motor and application development and demonstration • Rotary encoder and its interfacing with PLC • Programming example with rotary encoder • Stepper motor and stepper motor drive • Programming example with stepper motor • Demonstration of length cutting application based on PLC
01:15 –02:00	Lunch	
02:00 – 04:00	Dr. Divyang D. Vyas	Hands–on : Introduction to servo motor and application demonstration • Servo motor and servo motor drive • Programming example with servo motor • Demonstration of seismic table on PLC

DAY 4 (28/11/2019)		
09:00 – 11:00	Ms. Madhavi Wadurkar	Introduction to Advances in Industrial Automation • Introduction to advance product range and approaches in Industrial Automation.
11:00 – 11:15		**Tea Break**
11:15 – 01:15	Ms. Madhavi Wadurkar	Introduction to Automatic motor and pump test bench from Bharat Bijlee • Key components in test bench and its key features.
01:15 –02:00		**Lunch**
02:00 – 04:00	Prof. Anil D. Kansagara Prof. Vicky B. Doshi	Hands–on : Live case study at automatic motor and pump testing NABL laboratory • Demonstration of advance automatic system, its components, operation • Various Motor and pump test, their data logging and report generation
DAY 5 (29/11/2019)		
09:00 – 11:00	Dr. Divyang D. Vyas Prof. Vimal G. Limbasiya	Introduction to Industry 4.0 • Industry 4.0 - concept, architecture, scope and challenges • Additive manufacturing (3D printing) and its role in Industry 4.0
11:00 – 11:15		**Tea Break**
11:15 – 01:15	Mr. Kishan K. Govani Mr. Parth Kaneriya	Hands–on : Introduction to Industrial Gateways • Industrial Gateways – concept, architecture and functionality • Concept of data analytics and UI • Demonstration of creating and IR4.0 based application through use of industrial gateway
01:15 – 02:00		**Lunch**
02:00 – 07:00	----	Field visit

		• Observe various field applications of automations
DAY 6 (30/11/2019)		
08:00 – 09:30	Prof. Rakesh D. Oza	Universal Human Values • Core of universal human values and its importance • Ethics and values
09:30 – 10:30	----	End course assessment and course feedback • Participant evaluation • Program evaluation
10:30 – 10:45	**Tea Break**	
10:45 – 12:45	Mr. Tejas Prajapati Mr. Kishan Patel	Future trends in Industrial Automation • Future scope and challenges • Possibilities of Research and Development
12:45 – 1:15	----	Valedictory • Concluding Session • Certificate Distribution
01:15 –02:00	**Lunch**	

8. Industrial Visit Details of the Faculty Development Program

Name of the Industry	Feris Spintex Pvt. Ltd.	
About the Industry	- Production capacity of thousands of yarn per day - Spinning plant is approved by Government of India under Technology Mission on Spinning - Spinning plant is conferred the certificate from Control Union Certification - Netherlands for its production of 100% organic cotton products - Produces 100% contamination free yarn with very good grade and quality - Spinning plant, dye house and garmenting section are powered by green energy	
Contact Details	At. Adepar, Ta. Morbi, Gujarat +91 75758 88000 info@ferisspintex.com www.ferisspintex.com	
Products	- Blended Yarn - Polyester Yarn - Spun Yarn	- Weaving & Knitted Yarn - Cotton Yarn - Woven & Knitted Fabrics

9. Glimpses of the Faculty Development Program

Day – 1 (25/11/2019)

Glimpse 1 Inauguration

Glimpse 2 Lighting a Lamp

Glimpse 3 Expert Talk by Dr. H. G. Patel

Glimpse 4 Hands on session by Mr. K. M. Vyas @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Glimpse 5 Hands on @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Glimpse 6 Hands on @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Day – 2 (26/11/2019)

Glimpse 7 Expert Talk by Dr. D. R. Bhojani

Glimpse 8 Hands on session by Dr. D. R. Bhojani @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Day – 3 (27/11/2019)

Glimpse 9 Hands on session by Dr. D. R. Bhojani @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Glimpse 10 Hands on session by Dr. D. D. Vyas @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Glimpse 11 Hands on session by Dr. D. R. Bhojani @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Glimpse 12 Demonstration of Seismic Table at the Institute as PLC based system by Dr. D. D. Vyas

Day – 4 (28/11/2019)

Glimpse 13 Expert Talk by Ms. Madhavi Wadurkar

Glimpse 14 Hands on @ DIET Motor and Pump Testing Laboratory (NABL Accredited)

Day – 5 (29/11/2019)

Glimpse 15 Expert Talk by Dr. D. D. Vyas

Glimpse 16 Expert Talk by Mr. Parth Kaneriya

Glimpse 17 Hands on session by Mr. Kishan Govani @ DIET Center for Advance Training in Industrial Automation (CAT-IA)

Glimpse 18 Hands on session by Prof. V. G. Limbasiya @ DIET 3D Printing Laboratory

Glimpse 19 Industrial Visit @ Feris Spintex Pvt. Ltd.

Glimpse 20 Industrial Visit @ Feris Spintex Pvt. Ltd.

Day – 6 (30/11/2019)

Glimpse 21 Expert Talk by Prof. R. D. Oza

Glimpse 22 End Course Exam and Discussion
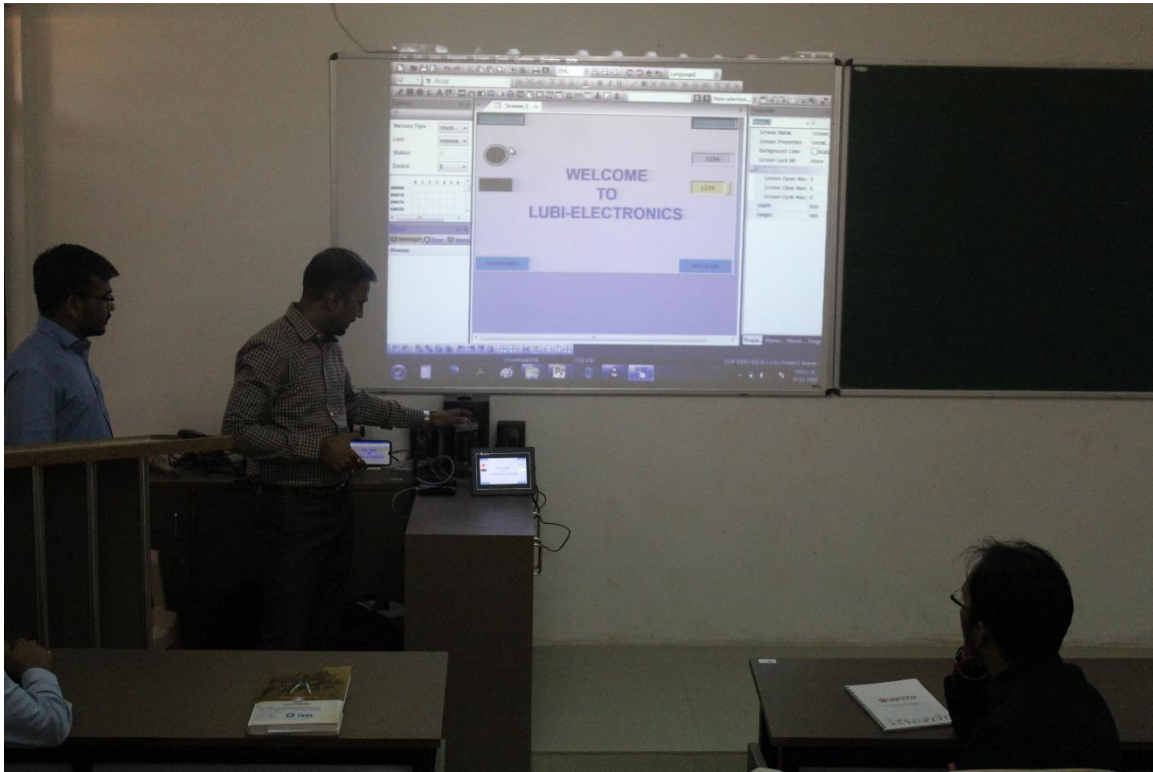
Glimpse 23 Expert Talk by Mr. Tejas Prajapati

Glimpse 24 Valedictory

Glimpse 25 Participant's Feedback

Glimpse 26 Group Photograph