Objectives

At the end of the program, the participants will be able to:

- ✓ Analyze, and model latest technological advancements in context with laboratory teaching and learning.
- ✓ Develop experiments based on recent technologies.
- ✓ Perform experiments that are in line with the newly emerged technological fronts in Electrical Engineering.

Course Content

Technology is quickly changing in this era of technological transformation. In order to cope up with these advancements in technology with reference to training of engineering students, the best way is to strengthen and make the laboratory practices adopted, in line with these changes. This will make students industry ready, will enable them to work with latest technology available to meet the future technological challenges. This training programme addresses this need of providing hands-on-experience on recent advancements in laboratory practices of Electrical Engineering. The mode of delivery would be the chalk-board, presentations and hands on practices.

Faculty

Course will be conducted by senior in-house faculty, and faculty from the premier institutes, eminent experts from research organizations, utilities and industries working in this area, few of them are:

- ❖ Prof. (Dr.) K. Gopakumar, IISc, Bangalore
- ❖ Prof. (Dr.) Bhim Singh, IIT Delhi
- ❖ Prof. (Dr.) B. G. Fernandes, IIT Bombay
- ❖ Prof. (Dr.) N. C. Sahoo, IIT Bhubaneshwar
- ❖ Dr. Ujjwal Kalla, Project Director, CERDC, Bikaner

Evaluation Criteria and Grade Allocation

A method of formative and summative assessment will be followed to evaluate the learning by participants during the programme and grades will be allocated to the participants based on the evaluation. The certificate will be given only to those participants who have been able to successfully clear the evaluation criteria. The communication will be issued for the participants not able to clear the programme requirements through the letter on the institute letter head.

Eligibility for STTP

Faculty from Electrical Engineering background, professionals from industries, utilities, consultants, R&D organizations in Electrical Engineering and relevant field, and Ph.D. Scholars.

How to Apply

Interested faculty members from Engineering colleges, polytechnics, persons from industries and R&D organizations, Ph.D. scholars are requested to fill-up the attached application form and return it to the Coordinator, so as to reach on or before June 15, 2018. **Applicants should send the Demand Draft in favour of "Institute of Technology, Nirma University," payable at Ahmedabad**.

Certificate from Sponsoring Authority

Certified that the above applicant is employed in our organization and the information stated by him/her has been verified and found correct. We sponsor him/her for attending Short Term Training Programme.

Date:
Place:

Signature of sponsoring authority with seal

Course Fee and Registration

Faculty members	Rs. 5000/-
Participants from industry and R&D organizations	Rs. 8000/-
Full-Time research scholars	Rs. 3000/-

Course fees include softcopies of learning material, tea and working lunch. Participants are required to make their own arrangements for lodging, boarding and travelling. However, on request, the arrangement for accommodation can be made on chargeable basis. All other expenses are to be borne by the participants. Course fee is non-refundable.

Important Dates

Last date for receipt of application	15/06/2018
Confirmation of selection by email / website	18/06/2018
Commencement of course	25/06/2018

Please send the duly filled application form to:

Dr. Siddharthsingh K. Chauhan
Department of Electrical Engineering,
Institute of Technology, Nirma University
Sarkhej- Gandhinagar Highway, Tragad Patia,
PO Chandlodia, Ahmedabad - 382 481
Tel.: (079)-30642517 (O), +91 – 9825576640 (M)
E-mail: siddharthsingh.chauhan@nirmauni.ac.in

APPLICATION FORM

ISTE Approved Short Term Training Programme
on
Hands-on-Experience in Advanced Laboratory Practices in Electrical Engineering
June 25 – July 07, 2018

Under the Auspices of
Centre for Quality Assurance and Academic Development

Organized by
Department of Electrical Engineering
Institute of Technology,
Nirma University, Ahmedabad

1. Name: ……..……..
2. Designation: ……..……..
3. Qualification: ……..
4. D.O.B.: …….. Sex: Male / Female
5. Institution/Industry: ……
6. Mailing Address: ……

   ……..

   Phone: …… Fax: ..……..

   E – mail: ……..
7. ISTE Membership No.: ……
8. Experience:

   Teaching: ……..... Years …….. Months
   Industrial: ……..... Years …….. Months
9. Subjects Taught: ……..……
10. Hostel Accommodation required: Yes/ No
11. Demand Draft: Rs.: …… No: …….

    dated: …….. Bank: ……..

Place :
Date :

Signature of Applicant

About Nirma University

Nirma University, NAAC Accredited 'A' Grade, was established in the year 2003 as a statutory university under Gujarat State Act at the initiative of Nirma Education and Research Foundation (NERF). In 1994, founder of Nirma Industries and an internationally renowned entrepreneur Dr. Karsanbhai K. Patel crystallized his long cherished dream of providing world class facilities for professional education in Gujarat. He established NERF, which in-turn established seven institutions. Functioning under the aegis of NERF, the University presently includes a top grade – Institute of Technology (1995), a leading business school – Institute of Management (1996), an Institute of Pharmacy (2003), Institute of Science (2004), Institute of Law (2007), Institute of Architecture & Planning (2014), Institute of Commerce (2016), and Department of Design (2017). All these institutions have emerged as centers of excellence offering various programmes ranging from undergraduate to doctoral levels in technology, engineering, business, pharmacy, sciences, law and architecture.

About the Institute

Institute of Technology is a leading institute offering multidisciplinary undergraduate, postgraduate, MCA and PhD programmes in engineering. Institute is located in peaceful and sylvan surroundings, about 15 km from Ahmedabad Railway Station on Sarkhej Gandhinagar highway. The academic ambience provides full scope for development. The presence of the institute can also be felt by its alumni spread in national and multinational organizations as well as leading universities throughout the world. The institute provides an inspiring environment to all students to expand their intellectual dimension and recognize their hidden talents, not only in the technical field, but also in life skills.

Achievement Highlights

- National Award for Engineering College having Best Overall Performance for the year 2002, Best Engineering Teacher & Best M.Tech. Thesis awarded for the year 2016 by Indian Society for Technical Education (ISTE).
- Students won national ROBOCON competition in 2002, 2003, 2006, 2008, 2011, 2014, 2015, 2018 and represented India in International meets.
- The Institute has been ranked 21st in Top 25 India's Best Colleges and 2nd in West Zone by India Today in 2016.
- The Institute is ranked 3rd in top 10 T-Schools in the west zone by DataQuest CMR T-School Survey in 2017.
- Institute has been ranked 7th in top 10 Engineering colleges in India for placement by Higher Education Review, 2017

About the Department

Department of Electrical Engineering runs U.G. and P.G. programmes under the Umbrella of Institute of Technology, Nirma University. The Department offers one B.Tech. Programme in Electrical Engineering and two M. Tech. Programmes in Electrical Engineering with specialization in Power Electronics, Machines & Drives (PEMD), & Electrical Power Systems (EPS). It also offers Ph.D. degree. The department is enriched with latest equipment like advanced electrical machines, solar and wind energy trainer kits, DSP kits, DSpace, OPAL-RT, Power and Spectrum Analyzer, HV laboratory, etc. and Software Packages like MATLAB, SPEED, ANSYS, MAGNET, Motorsolve, PSCAD, PSIM etc. The department has the state-of-art laboratories and all necessary facilities to enhance the quality of teaching-learning process. The department also organizes training programs, workshops, seminar and conferences for students, academicians and people from industries.

Centre for Quality Assurance and Academic Development

Nirma University has constituted a Centre for Quality Assurance and Academic Development (CQAAD) (formerly known as Academic Development and Research Cell) in the year 2008. The prime task of the CQAAD is to facilitate and participate in the development of a system for conscious and consistent improvement in the academic and administrative performance of the University. The centre facilitates the constituent institutes to ensure the sustenance of best academic practices; suggests innovative practices; takes new initiatives to remove deficiencies and enhance academic and administrative quality; promotes finest learning–teaching ambience and prepares for accreditation. The CQAAD is vibrant and regularly organizes various faculty development programmes in diversified areas which include induction programme, orientation programme, refresher programmes, short term training programmes, etc. and also the training programs for non-teaching staff of the University. The CQAAD also undertakes department, institute and university level academic audit to facilitate the efforts of the constituent institutes of the University in leveraging the academic and research standards, conformity to strategic planning and overseeing extension activities for social benefits, etc.

ISTE Approved Short Term Training Programme
on

Hands-on-Experience in Advanced Laboratory Practices in Electrical Engineering

June 25 – July 07, 2018

Coordinator

Dr. Siddharthsingh K. Chauhan

Under the Auspices of

Centre for Quality Assurance and Academic Development

Organized by

NIRMA UNIVERSITY
INSTITUTE OF TECHNOLOGY
NAAC ACCREDITED 'A' GRADE

Department of Electrical Engineering
Institute of Technology,
Nirma University,
Sarkhej-Gandhinagar Highway
Ahmedabad- 382 481, Gujarat, India
Phone: +91-02717 – 241911/12/13/14/15,
+91-079-30642000
Fax: +91-2717-241917
Website: www.nirmauni.ac.in/ITNU

Nirma University
Institute of Technology, School of Engineering
Department of Electrical Engineering

STTP on
"Hands-on-Experience in Advanced Laboratory Practices in Electrical Engineering"

25th June to 7th July 2018

Programme Outcome Report

- **New experiments added in the curriculum**

Following 14 new experiments were developed during the STTP, which are added in the curriculum of various subjects of U.G. & P.G. programmes of Electrical Engineering:

Sr. No.	Experiment Definition	Details of Programme/Semester/Subject wherein the said expt. is to be incorporated
1.	Development of driver card using SKYPER 32R driver core for IGBT based converter	B.Tech. in EE/Sem-V/Power Electronic Converters (EE504)
2.	Development of Three-level inverter Flying Capacitor/Neutral Point Clamped Converter with driver board	B.Tech. in EE/Sem-VII/ Digital Signal Processors for Electrical Engineering (EE702); Sem-VII/Minor Project (EE704); Sem-V/Mini Project-I (EE507); Sem-VI/Mini Project-II (EE604); M.Tech. – PEMD/ Sem-I/Digital Signal Processing (3EE1108)
3.	Realization of open-loop SVPWM for two-level converter	B.Tech. in EE/Sem-VII/ Digital Signal Processors for Electrical Engineering (EE702)
4.	To design and fabricate medium transmission line and determine its efficiency and regulation (PI Model)	B.Tech. in EE/Sem-VI/Power System Operation & Control (EE601)
5.	To analyse IEEE standard test case system in NEPLAN and perform load Flow, short circuit studies, stability and congestion management	B.Tech. in EE/Sem-VI/Power System Operation & Control (EE601)
6.	To analyse relay coordination in 9 bus system	B.Tech. in EE/Sem-VII/Power System Protection & Switchgear (EE703)
7.	To perform short term load forecasting of the power system using fuzzy logic technique	B.Tech. in EE/Sem-VII/Computer Techniques in Power System (EE733)
8.	Demonstration of synchronous generator parallel operation with different loading conditions and load angle changes	B.Tech. in EE/Sem-V/Rotating AC Machines (EE502)
9.	To obtain back-emf waveform of PM machine and validate it with simulation results	B.Tech. in EE/Sem-VI/Permanent Magnet Brushless and Reluctance Motors (EE621)
10.	Demonstration of d - q axis currents of alternator and its variations due to load changes	B.Tech. in EE/Sem-VI/Dynamics and Modelling of Electrical Machines (EE622)
11.	Design and development of Energy/Power Measurement using Microcontroller	B.Tech. in EE/Sem-V/ Microprocessor and Microcontroller (EE506)

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12.	Fabrication of IOT Enabled Home Automation System	B.Tech. in EE/Sem-VI/ Advanced Microprocessors and Microcontrollers (EE641)
13.	Determination of Two Port Network Parameters for AC Systems	B.Tech. in EE/Sem-III/Network Analysis and Synthesis (EE302)
14.	Design and development of Linear Power Supply using LM723	B.Tech. in EE/Sem-V/Power Electronic Converters (EE504)

- **Knowledge generation in the form of detailed technical report**

This STTP was focussed on development of experiments in various areas of Electrical Engineering. STTP comprised of laboratory sessions during which the participants worked towards development of assigned new experiments. In order to strengthen the knowledge required for development of laboratory practices in different areas of Electrical Engineering, following lecture sessions of experts from IITs, industries, research organizations and reputed academic institutions were scheduled:

- Design and Control of Multi-level Inverters for Drives and Grid-tied Applications
- High Resolution Multi-level Voltage Space Vector Structure Generation for Variable Speed Drives and Grid-tied Applications
- Role of Laboratory Work in Electrical Engineering Education: Student and Faculty Perceptions
- Implementation of Single Phase Microgrid using Renewable Energy Sources
- Implementation of Twelve-pulse Battery Charging System
- Testing and Analysis of PWM AC Controller in Real-time
- Experimental Determination of Electromagnetic Characteristics of Switched Reluctance Motor and Various Practical Issues
- Life Estimation Techniques and Health Index of Transformers
- Preparation of Laboratory Manual
- Know Your Equipment and Safety Aspects of Electrical Engineering Lab
- Practical Selection, Design & Interconnection of Passive Components for Power Electronic Systems
- Practical Design & Layout of Power Electronic Systems with Power Components
- Simulations / Animations for UG and PG Laboratories using MATLAB
- Application of FEM to Electrical Engineering
- Implementation and Control of Battery Backed Grid-tied Inverters for Electric Vehicle Applications
- Power Scenario of India – Challenges and Future
- Resurgent Renewable Sector – Integration and Challenges
- Interpretation of Results and Deriving Conclusions of the Experiment
- Understanding Important Concepts of Power Systems Engineering through Practical's / Simulations
- Smart Grid Optimization

Presentations and learning material on the above topics were provided by the experts and same has been shared with the participants. Three assignments based on the sessions conducted during STTP were given to the participants (considered as a component of assessment) and the same were submitted by all participants. These assignments will work as learning material for the respective subjects taken by participants of the STTP. Laboratory manuals for the newly developed experiments were prepared by the participants (considered

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(Dr. P. V. Tekwani) (Dr. S. K. Chauhan)

as a component of assessment), which are incorporated in laboratory manuals respective subjects of U.G. & P.G. programmes of Electrical Engineering. Also, visits to following industries helped the participants to familiarize with industrial practices of experimentations conducted in different areas of Electrical Engineering:

- Electronics and Quality Development Centre (EQDC), Gandhinagar
- ABB Power Technology Experience Center (ABB Power TEC) , Vadodara
- Electrical Research and Development Association (ERDA), Vadodara

- **New pedagogy to be adopted**

During the said STTP 14 new experiments were developed along with their respective laboratory manuals. These experiments are incorporated as a part of laboratory teaching for corresponding courses of U.G. & P.G. programmes of Electrical Engineering. Hence, inclusion of newly developed experiments in curriculum is the new pedagogical practice evolved from this STTP.

- **New courses/electives to be offered -** NIL

- **Revision in the existing curriculum based on the deliberations**

Existing laboratory manuals of different subjects of U.G. & P.G. programmes of Electrical Engineering are updated by the inclusion of newly developed experiments.

- **New cases adopted -** NIL

- **Linkages/collaborations developed with industries/organizations/institutions, etc.**

This STTP resulted in development of linkages with different industries, organizations and institutions, which can be used in future for project placement, expert talks, industrial visits, etc. Linkages are developed with following persons:

- Prof. Dr. K. Gopakumar, Professor, Department of Electronic Systems Engineering, IISc Bangalore
- Prof. Dr. Bhim Singh, Professor, Department of Electrical Engineering, IIT Delhi
- Prof. Dr. N. C. Sahoo, Professor, Department of Electrical Engineering, IIT Bhubaneswar
- Prof. Dr. S. K. Biswas, Professor, Department of Electrical Engineering, Jadavpur University
- Prof. Dr. B. G. Fernandes, Professor, Department of Electrical Engineering, IIT Bombay
- Dr. Ujjwal Kalla, Project Director, Ceramic Electrical Research & Development Centre, Bikaner
- Dr. S. H. Chetwani, Head, R & D, Electrical Research and Development Association
- Shri. R. D. Pandya, Head, L & T Power Training Institute, Vadodara
- Shri. Aakash Trivedi, Dy. General Manager, L & T Power Training Institute, Vadodara
- Prof. Dr. M. C. Chudasma, Professor, Department of Electrical Engineering, L. D. College of Engineering
- Prof. Dr. Ketan Badgujar, Professor, Department of Electrical Engineering, SSGEC Bhavnagar
- Prof. Dr. Bhavik Suthar, Professor, Department of Electrical Engineering, GEC Bhuj
- Prof. Dr. K. S. Pandya, Professor, Department of Electrical Engineering, Charusat-Changa

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- ❖ Shri. Hasmukh R Gujjar, Asst. Vice President, Head Customer support & Training, ABB India Limited, Maneja, Vadodara
- ❖ Ms. Manisha Shukla, Technical Training Advisor, ABB PowerTEC, Vadodara
- ❖ Ms. Lata Shah, Assistant Manager, Electrical Research and Development Association
- ❖ Shri. K. T. Patel, Deputy Director, Electronics And Quality Development Centre (EQDC)
- ❖ Shri. Dipak Chavda, Quality Manager, Electronics And Quality Development Centre (EQDC)

- **Other relevant matter to be added (if any)** - NIL

Dr. Siddharthsinghi K. Chauhan
Programme Co-ordinator

Prof. Dr. P. N. Tekwani
HoD and Mentor, EE, IT-NU

Through:

Prof. Dr. R. N. Patel
Addl. Director, IOE, IT-NU
Institute of Technology
Nirma University

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To,
The Deputy Director
CQAAD
Nirma University