NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH

SECTOR 26, CHANDIGARH–160019

TEAMING TOGETHER

NITTTR CHANDIGARH

DEPARTMENT OF ELECTRICAL ENGINEERING

NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH
SECTOR 26, CHANDIGARH –160019

Vision

To be a centre of excellence for promoting education training and research in the field of Electrical Engineering.

Mission

1. To offer continuing education and training programs for the faculty and staff of the technical education system in the area of Electrical Engineering.

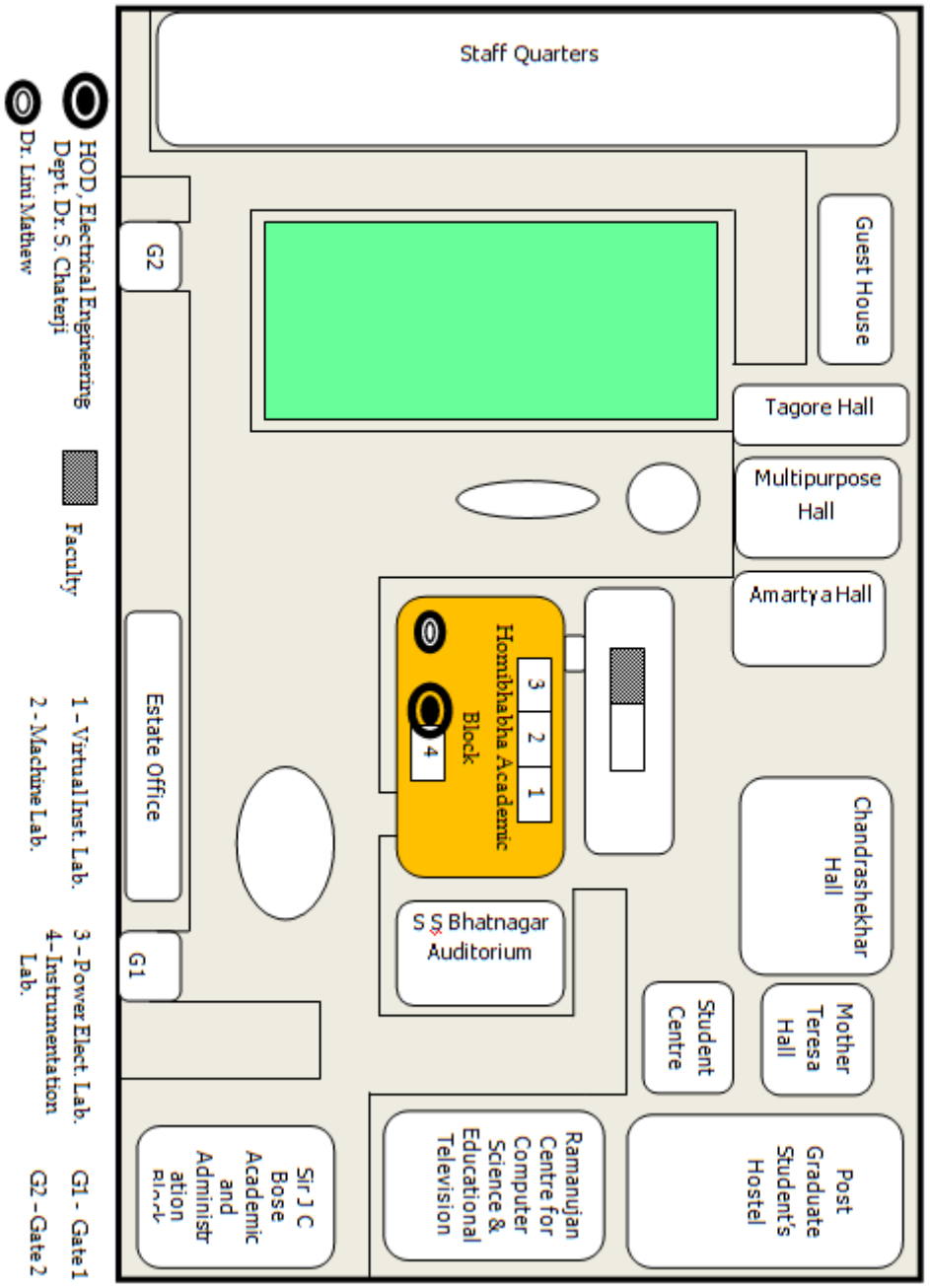
2. To develop need-based curricula for technical education programme in the field of Electrical Engineering.

3. To develop instructional material in the field of Electrical Engineering to enhance effectiveness of teachers-learning process.

4. To undertake research and development in the area of Electrical Engineering.

5. To provide extension and consultancy services to technical education system and industry in the area of Electrical Engineering.

NITTTR CHANDIGARH LAYOUT



ABOUT THE DEPARTMENT

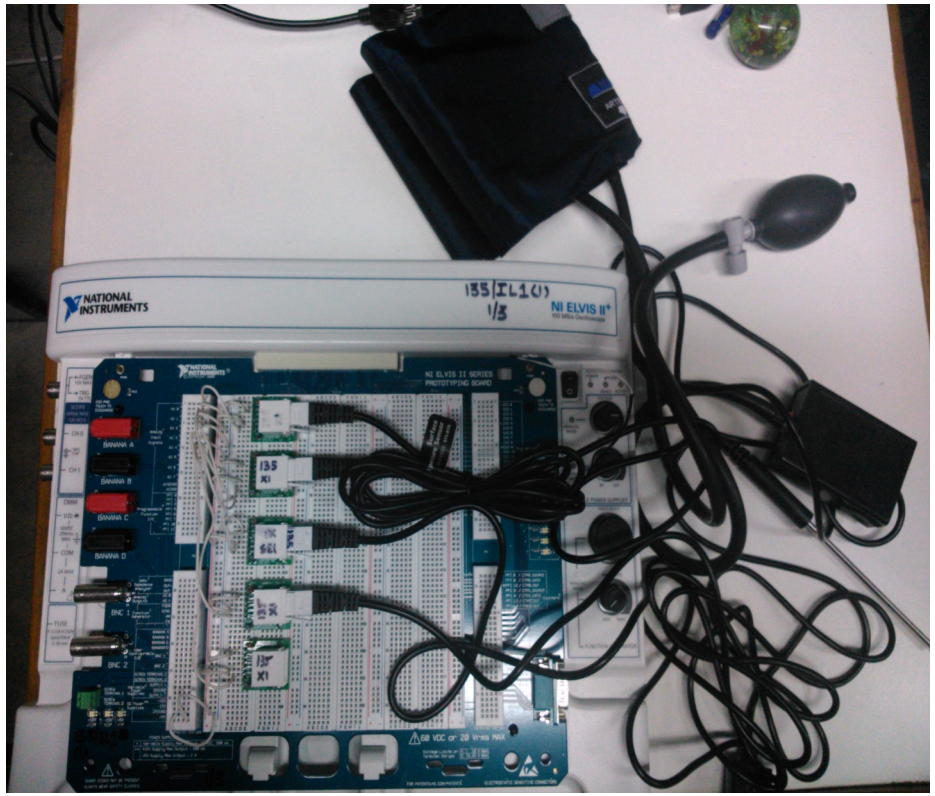
Education is all about creating an environment of academic freedom, where bright minds meet, discover and learn. Electrical Engineering is a continuously evolving field with new innovative ideas emerging every other second. As technology has advanced, so have the challenges faced by the fresh engineers and technocrats.

Electrical Engineering is one discipline that naturally partners with other disciplines to open whole lot of new engineering avenues. Examples include Power Electronics - with Power and Electronics Engineering and Bio-medical Sciences - with Medicine. The Electrical Engineering Department at NITTTR, Chandigarh grooms teachers of Polytechnics and Engineering Colleges in this field using new-age information and computer-intensive technologies. It is one of the major departments, created since, the establishment of the institute.

OBJECTIVES OF THE DEPARTMENT

- To conduct need-based short term training programmes in various areas of Electrical Engineering for teachers of Polytechnics and Engineering Colleges of all over India.

- .To run Master degree programmes in Regular and Modular modes with specialization in Instrumentation & Control in order to upgrade the qualifications of the faculty of Polytechnics and



Emona ETT-211 Fotex fiber optics Communication Trainer etc.

FUTURE PLANS

The department is planning to take-up two DST sponsored projects as:

(i) Grid Connected Hybrid System consisting of Solar , Wind, Fuel Cell and High Power Storage Batteries

(ii) Energy Park

Proposals are being prepared at the department level which will be soon sent to DST through proper channel for final approval.

Engineering Colleges. Recently the nomenclature of the degree has been changed and the new name of the degree is M.E in Electrical Engineering (Instrumentation and Control).

- To undertake research projects by guiding research scholars in their ME and Ph.D theses.

- To undertake appropriate sponsored projects from various agencies for the enhancement of Technical Education in the country.

- To produce instructional materials, both print and non-print, for the benefit of teachers and students of technical institutions.

- To conduct tailor made training programmes for industry and other working professionals in various thrust areas of Electrical Engineering for upgrading their knowledge .

- To conduct in house training and Industry-Institute interaction programmes to upgrade the knowledge of internal faculty.

- To design, develop, review and modify curricula of various programmes in the current as well as in the emerging areas in order to fulfil identified needs.

- To develop relevant learning resources like text books, laboratory manuals, self-learning modules, multi-media packages, etc.

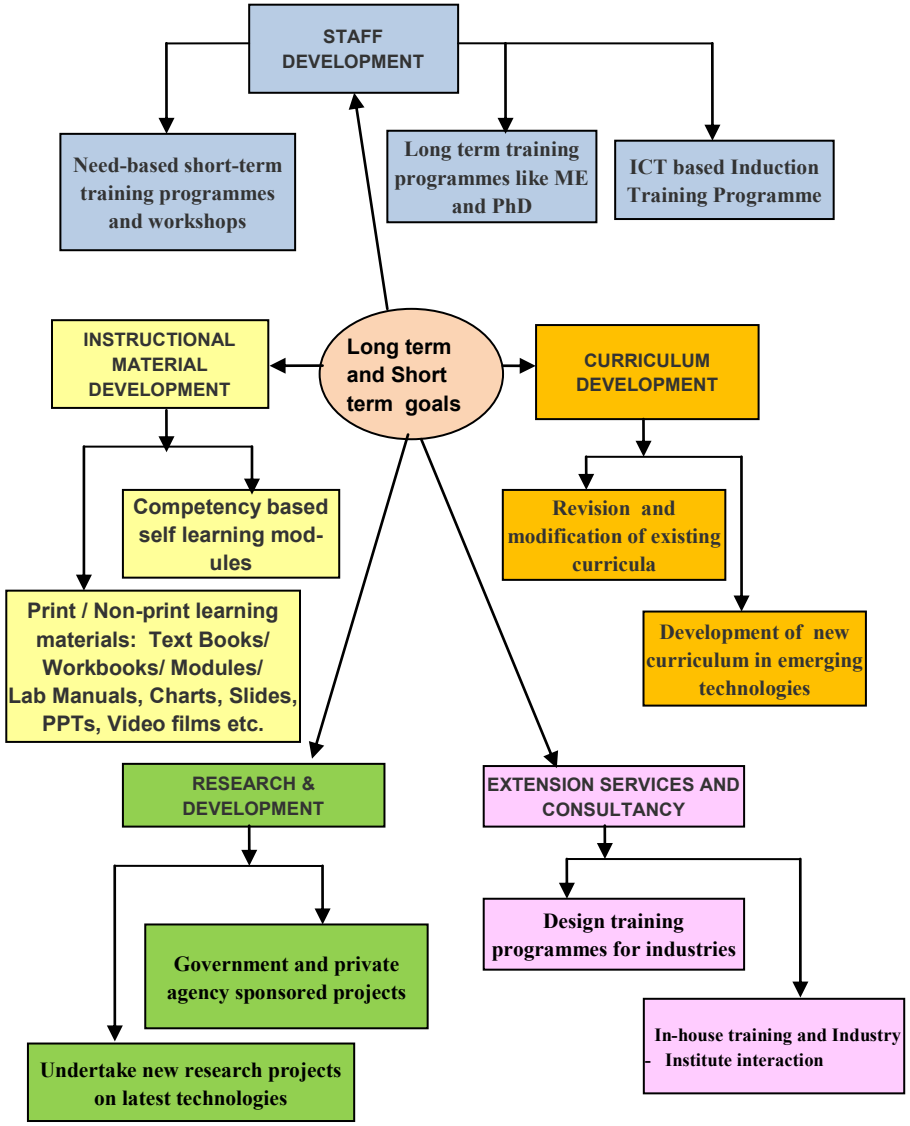
- To undertake research projects for expanding the horizons of the department in order to reflect changing technologies.

(vii) Virtual Instrumentation Laboratory

This laboratory is being developed recently and various equipments have been purchased such as NI ELVIS II with Circuit design bundle, Mechatronic Sensor board, Quanser Qnet DC motor control,

Quanser Qnet rotory inverted pendulum, Quanser Qnet HVAC trainer, free scale NI Elvis microcontroller prototype board, Vernier Gran Engineering Sensor kit, Vernier Bio-instrumentation sensor,

SHORT AND LONG TERM GOALS



(v) Process Control Laboratory

This laboratory has facilities for experiments on Microprocessor and PC based process control including flow, level, temperature etc. along with the supporting software.

(vi) Computer Applications Laboratory

The computer applications laboratory has various software packages such as MATLAB, LabVIEW, PSCAD, LIVEWIRE, LADSIM etc. which are used for simulation, design and analysis of various electrical and electronic systems and their control .

TRAINING PROGRAMMES

LONG TERM TRAINING PROGRAMMES

ME PROGRAMME

The department has been very successfully offering Master of Engineering Course in Instrumentation and Control with a starting Intake of 12 students since 2005. The intake started increasing gradually and the present intake for the above programme has risen to 26. In addition, the department also conducts ME (Instrumentation & Control) Modular Programme with an intake of 40.

The programme educational objectives (PEOs) and Programme Outcomes (POs) of M.E. in Electrical Engineering (Instrumentation and Control) programme are :

Programme Educational Objectives (PEOs)

PEO1	To develop technical knowledge and skills in the area of Instrumentation and Control at Postgraduate level.
PEO2	To develop ability to undertake research and development in the areas of Instrumentation and Control.
PEO3	To develop generic skills such as creativity, problem solving, communication, teamwork, life long learning and leadership as well as professional ethics and values.

Programme Outcomes (POs)

(a) Ability to understand, apply, analyze, evaluate and synthesize existing and new knowledge related to Instrumentation and Control.

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Power Electronics Laboratory also has a microprocessor based energy manager, large number of measuring instruments, Solar PV Training and Research Kit and Cascade Multilevel inverter (H-Bridges) which can be interfaced with MATLAB using Dspace unit and Cyclone III FPGA development kit.

(iv) Instrumentation and Control Laboratory

The Laboratory has a set of training boards on Transducers, Process Control, Analog Motor Control, Digital Motor Control and PC based data acquisition system in addition to various sensors, transducers and measuring instruments.

(b) Ability to identify, formulate and solve engineering problems creatively and generate new knowledge etc.
© Ability to design a system component or process as per need and specifications.
(d) Ability to use modern engineering tools, software and equipment related to Instrumentation and Control.
(e) Ability to undertakes collaborate research in multi disciplinary areas for finding solutions to the problems.
(f) Ability to understand professional and research responsibilities and contemporary issues as well as the impact of engineering solutions on the society.
(g) Ability to communicate effectively.
(h) Ability to continuously update knowledge and skills as per the requirement.
(i) Ability to apply the principles of project planning and management, total quality management and technology management for managing the project in Instrumentation & Control and multi disciplinary areas.

SHORT TERM TRAINING PROGRAMMES

The department has also been very active in conducting the need based short term training programmes every year as per the institute Operational Plan. To mention a few are:

Energy Management, Power Electronics, Automation in Industries, MATLAB, Repair & Maintenance of Electrical Equipment, Electric Drives and their Control, Thermal Power Station Practices, Hydro Power Station Practices, Virtual Instrumentation, Artificial Neural Networks and Fuzzy Logic, Microcontroller and its Applications, Electrical , Electronics and Computer Engineering Project Work, PLC and its Applications, Computer Applications in Electrical Engineering, Computer Aided Power System Analysis, FACTS Technology, Electrical Processes in Diesel Locomotives, Trouble Shooting and Repair of Transformers, Thyristorised Control of Electric Motors,

iii) Power Electronics Laboratory

In addition to number of training boards in Power Electronics, the laboratory is equipped with trainers on solid state motor control, three-phase triggering system, microprocessor based control systems, stepper motor control, thyristor based universal control kit, etc.

PRINT

To mention a few of the important materials, they are : text books in Electrical Machines, Electrical Engineering Material, Electrical Design and Drawing, Industrial Electronics and Control, Motor Control, Basic Electronics, Projects in Electrical and Electronics Engineering etc, laboratory manuals on Electrical Machines, Basic Electrical Microcontroller and its Interfacing etc. In addition there are several number of work books and student manuals.

NON PRINT

Apart from the print materials, the department has also produced about 30 video films on various topics pertaining to electrical engineering, 26 charts and several experimental kits on Power Electronics, Contactor Control devices and Electrical Machine Winding.

FACULTY AND STAFF IN THE DEPARTMENT

ii) PLC laboratory

The PLC laboratory is equipped with PLC based control system and Advanced PLC Trainer , other interfacing devices to train students how to program and upload ladder logic code. The lab is based primarily on the Allen Bradley family of Programmable Logic Controllers, which are widely used in factories and other settings.

A) FACULTY

(i) Dr. S.Chatterji
ME (Electrical), PhD.
Professor and Head
Email Address : chatterjis@yahoo.com

Ph.No.+91-172-2791552
Mobile No.:+91-9872301552

Membership of National / International Academic Bodies:

- Member, IEEE (USA)
- Fellow, IE (INDIA)
- Life Member, ISTE (INDIA)
- Life Member, NITTTR Alumni Association

Experience :

Industry	-	2 years
Teaching	-	39 years
Total	**-**	**41 years**

Area of Specialization : Power Systems, Power Electronics, Microprocessors/Microcontrollers, AI Techniques, Soft Computation.

Research guidance :

Masters : 115 + 100 (under process) **- 225**
Ph.D. : Ph.D degree awarded **- 04**
PhD scholars under supervision – **10 (1 are in the pipe line for final submission)**

Instructional Material Development : Print

(a) Number of Text Books Published : 3

1. "Industrial Electronics and Control", Co-authored with Dr. SK Bhattacharya, Tata McGraw Hill Publication, New Delhi
2. "Projects in Electrical, Electronics Instrumentation and Computer Engineering", Co-authored with Dr. SK Bhattacharya, Instrumentation and Computer; S. Chand Publications, Delhi .
3. "Power Electronics-Learning by Doing", Co-authored with Dr. SK Bhattacharya, All India Council for Technical Education, New Delhi

FACILITIES AVAILABLE IN THE DEPARTMENT

i) Electrical Machines Laboratory

In addition to various conventional ac and dc machines, one set of universal machine is also available in the laboratory. A part of the Electrical Machines Laboratory is specifically developed for Contactor Control of Electric drives wherein various trainer boards have been developed for performing different exercises in this area.

(b) No of papers Published in :

International Journals	- 46
National Journals	- 15
International Conferences	- 48
National Conferences	- 55
Patent (in Process)	- 02
Total	**- 166**

(c) No of Lab Manuals : 6

1. Industrial Electronics and Control
2. Thyristor control
3. Electrical Machines I
4. Electrical Machines II
5. Electrical Machines (Hindi)
6. Manual on Applications of Microcontrollers

(d) No of workbooks and others : 2

- Electrical Machines I
- Electrical Machines II

(e) Reports : 15

Non Print

Video Films : 16

- Power Electronics Lab Practices : 15
- Nuclear Power Station Practices : 01

Experimental Setup and Kits : 18

- Power Electronics :15
- Universal Training Kit :1
- Design and development of micro-controller based three phase fullwave fully controlled rectifiers : 2

Projects Carried out : Development of an algorithm for point tracking of multiple modules of paralleled photovoltaic system, Digital simulation of a Hybrid Power Flow Controller, Design and Development of a DC Motor Performance Analyser,

(ii) Mrs. R. Jayanthi
UDC
ITI
Experience: 28 Years
Expertise: Hindi Typing

(iii) Mr. Bhag Singh
Lab Attendant
Matric
Experience: 31 Years

C) REGULAR RESEARCH SCHOLARS REGISTERED IN PUNJAB UNIVERSITY, CHANDIGARH

(i) Mr. M.S. Narkhede,
Title : Modeling , Multi objective optimizaion and Analysis of a Virtual Power Plant
Supervisor : Dr S Chatterji

(ii) Mr. D.S. Karanjkar
Title : Analytical Design of Fractional Order Controller Based dc-dc Converter for Maximum Power Point Tracking in Solar Photo-Voltaic System
Supervisor : Dr S Chatterji

iii) Mr. Ram Murath Singh
Title : Performance Analysis of a Surface EMG based control scheme of an Exoskeleton Robot
Supervisor : Dr S Chatterji

Techno-Economic Analysis and Modelling of Stand-alone vs Grid Connected Small Hydro-Power Systems for Optimization of System Performance and Cost Effectiveness, Development of Energy Efficient and Cost Effective Model of Coal Fired Thermal Power Plants, Identification, Analysis and Compensation of Harmonics in power system networks using Hybrid Filters, Design and Development of a microcontroller based moisture content measuring device for cereal grains, Design and Development of a temperature compensated pH monitoring/control system for process industry, Performance Analysis of Technical and Commercial parameters to improve silicon nitride process for mass production of crystalline solar cells, Non visual Multimodal techniques for representing graphics data, Performance Improvement and construction of conventional thyristorised slip power recovery induction motor drive using variable turns ratio recovery transducer, Reactive power management for damping inter area oscillations in deregulated power systems, Digital simulation of a Thyristor Controlled Dynamic Brake (TCDB) for improving transient stability of a single - machine infinite bus system, Digital simulation of TCDB for improving transient stability of a multi-machine system, Physical simulation of a TCDB as a FACTS controller, Design and development of microprocessor based dual converter, Design and development of a modified interface for serial data transmission, Design and development of Fuzzy controllers, Design and development of Neuro-Fuzzy controllers, Design and development of Smart sensors based Controllers, Digital simulation of a three-phase full-wave fully controlled rectifier, Design and development of Microcontroller based control systems, Design and development of PC based controllers, Design and development of microcontroller based dual converter for four quadrant control of a dc shunt motor, Design and development of SIMULINK based TCSC, Design and development of a ANN based load fore-casting methodology.

B) SUPPORTING STAFFS

a) Technical Staff

(i) Mr. Hans Raj Sharma
Senior Technical Assistant
BE, Industrial Engineering & Management

Experience:36Years

Expertise: Electrical maintenance ,Installation and distribution, Basic electronics

No of papers Published in :
National Conference – 1

(ii) Mr. Vinod Kumar Sharma
Senior Technical Assistant
ME, Electrical Engineering

Experience:

Industry	-	3.5 years
Teaching	-	24 years
Total	**-**	**27.5 years**

Expertise: Electrical Machines, Electrical Engineering Laboratory Experiments

No of papers Published in :
International Journals – 2

b) Non – Technical Staff

(i) Mrs. Malkeet Kaur
Personal Assistant, MA
Experience: 30Years
Expertise: Stenography

(ii) Dr. (Mrs.) Lini Mathew
ME (Electrical Engineering) , PhD.
Associate Professor
Email Address lenimathew@yahoo.com

Ph.No.: +91-172-2633170
Mobile No.: +91-9876440458

Membership of National / International Academic Bodies:

- Life Member, NITTTR Alumni Association

Experience

Industry - 2 Years
Teaching - 28Years
Total - 30Years

Area of Specialization : ANN & Fuzzy Logic Applications, Digital Signal Processing, Measurement Instrumentation and Data Acquisition, Virtual Instrumentation

Research guidance :
Masters : 60

Instructional Material Development :

Print

(a) Number of Books Published : 1

i) Electrical Technology for Engineering Services Examinations, Co-authored with Dr. S.K. Bhattacharya. TMH Publishing Company, New Delhi

(b) No of papers Published in :

International Journals - 18
National Journals - 4
International Conferences - 11
National Conferences - 11
Total – 44

IV) Ms. Shimi S.L.
ME (Power Electronics and Drives)
Assistant Professor
Email Address**:** shimi_reji@gmail.com

Ph.No.: +91-172-2791860
Mobile No.: +91-9417588987

Membership of National / International Academic Bodies:
Member, IEEE (USA)
Life Member, NITTTR Alumni Association

Experience :

Industry - 01 Years
Teaching - 10Years
Total - 11 Years

Area of Specialization : Power Electonics and Drives, Digital Control, ANN & Fuzzy Logic Applications, FACTS, Renewable Energy, Soft Computing Techniques

Research guidance :
Masters : 03 + 13 (under process) - 16

No of papers Published in :

International Journals - 34
National Journals - 01
International Conferences - 27
National Conferences - 08
Total – 70

Projects Carried out : Design and development of a real time simulation of boost converter, Design and development of microcontroller based multi-starter for squirrel cage induction motor, Developing a real time simulation of MPPT based PV array fed cascade multilevel inverter

(c) No of Lab Manuals : 6

(i) Teaching Learning Package on Contactor Control Circuits, A Continuing Education Module, ISTE publication, Co-authored with Dr. S. K . Bhattacharya

(ii) Teaching Learning Package on Reading and Interpreting Engineering Drawing (For Electrical Engineering Technician and Technician Engineers), A Continuing Education Module, ISTE publication, Co-authored with Dr. S. K . Bhattacharya

(iii) A Monograph on Units and Dimensions, TTTI, Chandigarh, Co-authored with Dr. S. K . Bhattacharya

(iv) Installation Trouble-shooting and Preventive Maintenance of Motors, Transformers and Batteries, TTTI, Chandigarh, Co-authored with Dr. S. K . Bhattacharya

(v) Digital Signal Processing, Course Material.

(vi) Programming in C, Course Material.

Projects Carried out : Design and Development of a PC based monitoring system for a three-phase induction motor; Study and Implementation of Digital Signal Processing Tools; Study and Implementation of various DSP transforms; Digital simulation of a three-phase full-wave fully controlled rectifier; Design and development of Neuro-Fuzzy Controllers; Simulation of different FACTS Controllers using MATLAB/SIMULINK, Several consultancy and IRG projects carried out at the institute level which in turn generated funds to the tune of several lacs; Designed and developed the following Instructional material viz., Contactor Control Circuits; Reading and Interpreting Engineering Drawing; A monograph on Units and Dimensions; Installation Trouble-shooting and Preventive Maintenance of Motors, Transformers and Batteries; Signal Processing; Programming in C; MATLAB Programming; Introduction to LabVIEW.

(iii) Ms. Ritula Thakur

ME (Electrical Engineering)

Assistant Professor

Email Address: ritula_21@yahoo.com

Ph.No.: +91-172-2759548

Mobile No.: +91-9888520284

Membership of National / International Academic Bodies:

Life Member, ISTE
Life Member, Institution of Engineers
Life Member, IETE
Life Member, NITTTR Alumni Association
Life Member– IEEE

Experience :

Industry	-	Nil
Teaching	-	10years
Total -		**10 years**

Area of Specialization : Power Systems, Electric Drives, Microprocessors, Microcontrollers, Embedded systems, Custom Power Devices, Power Quality, Electrical Engineering and Information Technology in Agriculture, Quality Analysis and Detection Technology in Food Materials , Sensors and Instrumentation .

Research guidance :

Masters : 25

Instructional Material Development :

Print

No of papers Published in :

International Journals -	14
National Journals -	01
International Conferences -	05
National Conferences -	17
Total –	**37**

No of Lab Manuals : 01

Manual on Applications of Microcontrollers Co-authored with Dr. S. Chatterji

Projects Carried out : Temperature measurement using microcontrollers; Stepper motor control using microcontroller, Data Acquisition Using Embedded Processor in FPGA, Designed and developed Instructional manual on Microcontrollers and their Applications.