

# Electronics and Communication Engineering Department



**NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH**  
**SECTOR-26, CHANDIGARH-160019**

## About the Department

- ▶ The Department of Electronics & Communication since its establishment in 1967 progressed steadfastly to its present status of being reckoned as a Leader in Electronics & Communication.
- ▶ Sanctioned faculty strength of Two Professors, Two Associate Professors and Two Assistant Professors.
- ▶ The Department is actively involved in conducting Post-Graduate Industry Oriented & Practice based Master of Engineering course in Electronics & Communication Engineering in Regular mode since 1998 and from 2005 in Modular mode for the sponsored teachers of Polytechnics, Engineering Colleges, officials of Directorate of Technical Education and Industry Professionals at Regional and National Level in the country.

## About Department Salient Points

- ▶ The Department also offers Ph.D. Program in Electronics & Communication Engineering and is a centre for QIP for Polytechnic teachers.
- ▶ This year the Department has been conferred the status of a QIP centre for Engineering College teachers.
- ▶ As a part of Industry collaborative learning initiative, a new Master of Engineering Course in Electronics & Communication Engineering with specialization in Artificial Intelligence has been launched in 2020-21.

## About Department Salient Points

- ▶ Need-based short-term courses in the emerging areas are also conducted to update the knowledge and skills of faculty and technical staff of Polytechnics and Engineering Colleges
  - ▶ Wireless LANs & Computer Networks,
  - ▶ Advanced VLSI Design/VLSI CAD
  - ▶ Digital Signal Processing/Image Processing
  - ▶ Wireless & Mobile Communication,
  - ▶ Digital & Data Communication,
  - ▶ Embedded & Digital System Design,
  - ▶ Artificial Neural Networks & Fuzzy Logic,
  - ▶ Optical Fibre Communication, and
  - ▶ Biomedical Engineering etc..
- ▶ ECE Department is also involved in conducting Induction Training Programs through ICT in the Northern Region and beyond.

# Vision and Mission of the Department

## VISION

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

## MISSION

- To offer continuing education and training programs in the field of Electronics and Communication Engineering for the faculty and staff of the technical education system.
- To develop need-based curricula for technical education programs in the field of Electronics and Communication Engineering.
- To develop instructional material in the field of Electronics and Communication Engineering to enhance effectiveness of teaching-learning process.
- To undertake research and development in the field of Electronics and Communication Engineering.
- To provide extension and consultancy services to technical education system and industry in the field of Electronics and Communication Engineering.

## Uniqueness of Department

- PhD under QIP program for Diploma College Faculty
- PhD under QIP program for Engineering College Faculty
- Industry Supported M.E (ECE) with specialization in Artificial Intelligence
- M.E under Modular Program for working professional and faculty
- PG Diploma under NSQF scheme of UGC
- Trainings in emerging areas as per clientele need
- Conducting STCs through ICT mode since 2012
- Focus on Blended Learning
- Involvement of eminent expert under Distinguished Visiting Professorship Scheme
- Focus on Collaborative teachings with Industry

## Strengths of the Department

- Experienced faculty members, all having PhDs and more than 10 year of teaching/Research experience.
- Faculty covering a wide spectrum of ECE specializations.
- Located in electronics industry hub, effective Industry-Institute-Interaction.
- Academic activities and Research jointly with SCL, Tech Mahindra, CSIO etc.
- ECE eco system and industry tie-ups.
- Involvement and support of stakeholders.
- Excellent Infrastructure
- Joint Academic Interactions for research, extension services & resource generation

# Faculty Profiles

Name	Highest Qualification	Date of Joining	Research Areas
Dr. Sandeep Singh Gill Professor & Head	Ph.D. (ECE)	27.03.2019	VLSI Design, Soft Computing Techniques, Engineering Management.
Dr. Amod Kumar Professor	Ph.D (Signal Processing)	24.12.2018	Digital Signal Processing, Soft Computing, Biomedical Engineering
Dr. Balwinder Singh Associate Professor	Ph.D. (ECE)	11.10.2019	Antenna (Fractal, MIMO), ANN, Digital Signal Processing, Soft Computing.
Dr. Balwinder Raj Associate Professor	Ph.D, (VLSI)	17.12.2019	Nanoelectronics, Nanotechnology and energy based Devices, VLSI Design, Modeling and Simulation, FPGA Based Design, Artificial Intelligence
Dr. Kanika Sharma Assistant Professor	Ph.D. (ECE)	17.11.2004	Embedded Systems, Digital System Designing, Wireless Sensor Networks, Mobile Communication.
Dr. Garima Saini Assistant Professor	Ph.D. (ECE)	20.09.2006	Mobile & Wireless Communications, Advanced Digital Communication, Soft Computing, Antenna.



# Research papers/ Google Scholar Index/ h-index/ i10-index

Faculty Name	No of Research Papers			Google Scholar Index/ h-index/ i10-index
	SCI	SCOPUS	Others	
Dr S S Gill	12 (02)*	13 (04)*	35	223/ H=8 / i10=5
Dr Amod Kumar	38 (02)*	15 (01)*	41	120/H=6/i10=4
Dr Rajesh Mehra	15	61	450	1678/H=21/i10=48
Dr Balwinder Singh	7 (-)*	29 (02)*	20 (04)*	227/ H=8 / i10=8
Dr. Balwinder Raj	42 (06)*	18 (02)*	50 (05)*	905/H=16/i10=30
Dr Kanika Sharma	02	08	75	267/H=7/i10=4
Dr. Garima Saini	01	10	110	172/H=7/i10=4

\* After Joining NITTTR

# Vidwan Portal Profiling

Faculty Name	Vidwan Id
Dr. Sandeep Singh Gill	100138
Dr. Amod Kumar	182504
Dr. Balwinder Singh	171070
Dr. Balwinder Raj	170763
Dr. Kanika Sharma	170876
Dr. Garima Saini	171074

# Support Faculty

Department	Name	Highest Qualification	Research Areas
ECE/ DVP Scheme	Dr. A.L. Das, Ex-Director, SAMEER, Mumbai	Ph.D.(Electronics & Communication)	Antenna, Microwave Engineering and Radio Physics
CDC/ECE	Dr. Rajesh Mehra Professor & Head, CDC and Joint Professor, ECE	Ph.D.(Electronics & Communication)	VLSI Design, Digital Signal Processing, FPGA & Software Defined Radios, Multirate & Adaptive Systems, Photo-voltaic Cells & LEDs.
CDC/ECE	Dr. Meenakshi Sood Associate Professor , CDC and Joint Faculty, ECE	Ph.D.(Electronics & Communication)	Digital Signal Processing, Image Processing, Machine Learning, Soft Computing Techniques, Energy Harvesting and Storage, Biomedical Engineering, Antenna
Applied Science	Dr. B.C. Choudhary Professor	Ph.D.(Science/Physics)	Optical Fibre
Applied Science	Dr. Pankaj Sharma Professor	Ph.D.(Physics), M.Phil.(Physics),	Nano Technology
Applied Science	Dr. Ashok Kumar Associate Professor	Ph.D.(Materials Sci. / Nanosci.)	Nano Technology
Applied Science	Dr. K C Lachhwani Assistant Professor	Ph.D. (Mathematics)	Mathematical Programming, Operations Research, Soft Computing

## Staff Details

Department	Name	Highest Qualification
ECE	Sh. Ram Paul Sr. Technical Assistant (STA)	ITI in Wireman
ECE	Sh. Ashok Kumar Technician	B.Tech (Electronics and Telecommunication)
ECE	Sh. Sudhir Chopra SSA	BA

# **Facilities in the Department**

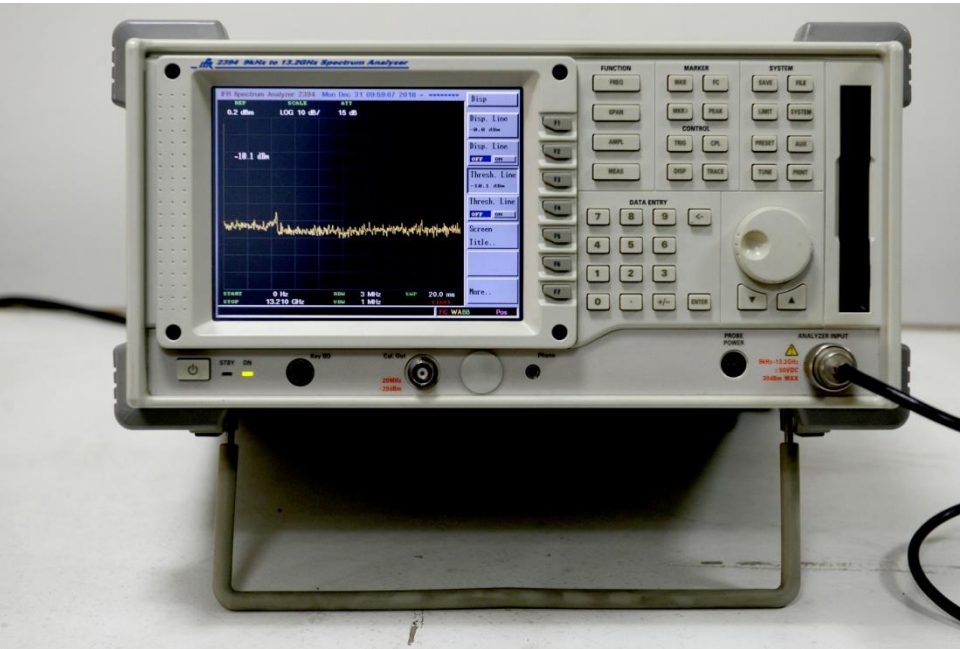
# Labs /Class Room details (area details)

Laboratory/ Class Room
Digital Signal and Image Processing
Communication Engineering Lab
Antenna Design Lab
VLSI Design Lab
Embedded System Design Lab
A. I. Lab
Electronic Service Center / PCB Design Lab
Class Room

# Antenna Design Laboratory

<b>Major Equipment</b>
HFSS Software
Vector Network Analyzer
Site Analyzer
Antenna Gain Measurement Setup
Spectrum Analyzer
RF Power meter with Sensor
PSG Analog Signal Generator
PCB Designing Software ( Orcad PCB Designer) Industrial Version
PCB Prototype Machine with Automatic Function
Tina V9 Circuit Design & Simulation Software along with PCB Design

# Antenna Design Laboratory



Spectrum Analyzer 9 kHz to 13.2 GHz



Signal Generator 20 GHz



# Antenna Design Laboratory



Antenna Testing and Radiation pattern measurement setup

# Antenna Design Laboratory



Vector Network Analyzer 20GHz



# Communication Engineering Laboratory

<b>Major Equipment</b>
Digital Communication Trainer Kit
Fiber Optic Communication Trainer Kit
Wireless Insite s/w 05 users
Qualnet 4.5 Research Licence for Singly User S/w with Accessories
Advance Wireless ( Wimax Library IEEE)
Wireless mobile Communication Kits
Cross bow Wireless Sensor Kit
Trainer Kits (GSM/GPS/RFID/B/tooth/Zbee/RF /Sensors
Data Acquisition Workstation
Dual Wave length Fiber Optic Laser Source & Detector Module
Wireless Network Development System
Wireless Sensor Network Development System
2G & 3G Trainer Board
EB 118 Mobile phone Training Solution

# Communication Engineering Laboratory



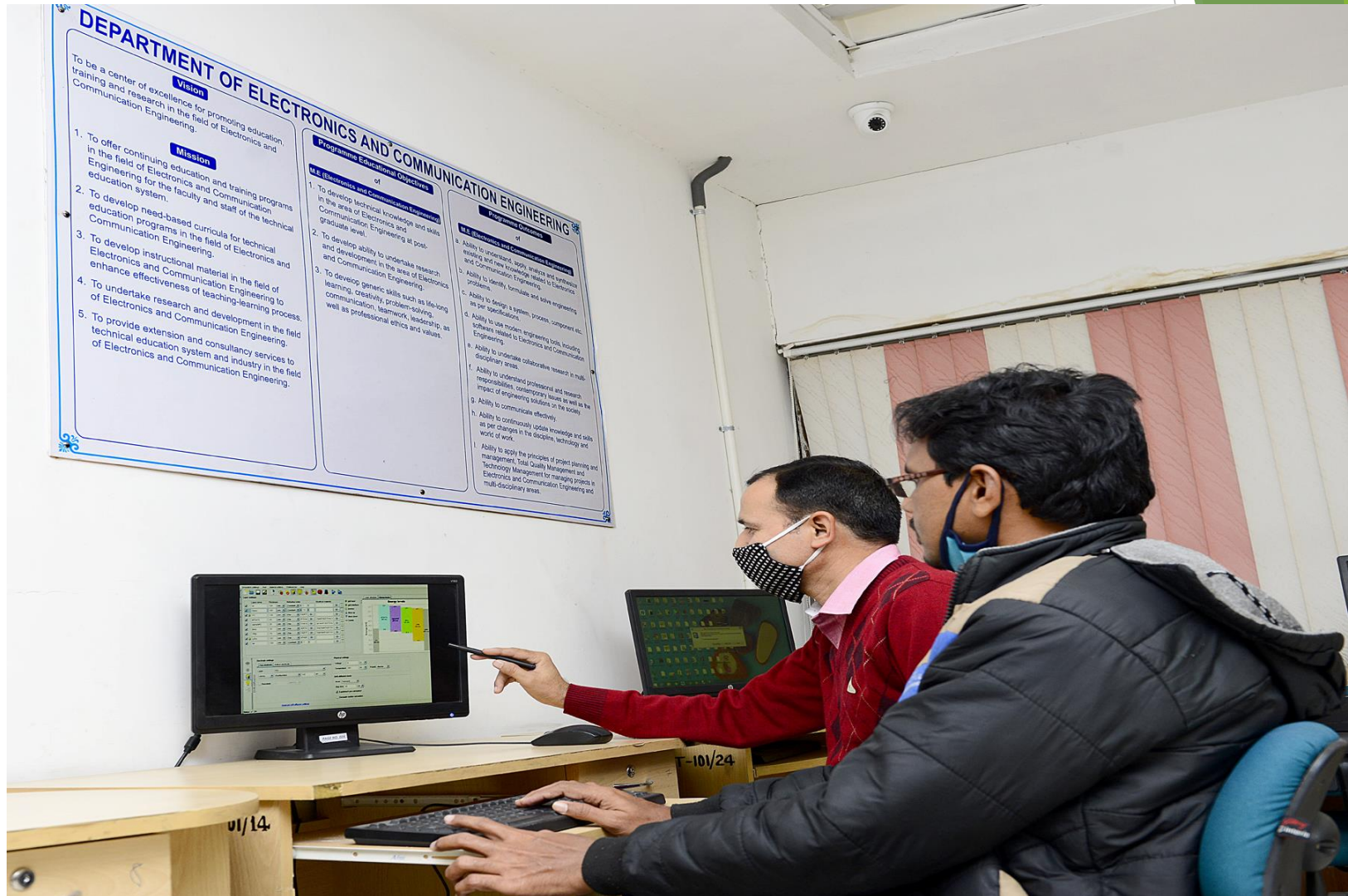


# VLSI Design Laboratory

Major Equipment
Fluxim SetFos Software
Silvaco TCAD Device Simulator ( 1 user)
Cadence Software (20 users)*
T-Cad software (5 users)*
VLSI Backend Simulation s/w (5 user)*
Design Process Tool 25 users
Spartan ( R) 6FPGA
ML 505 Platform developer and compact

\* Being renewed

# VLSI Design Laboratory



# Digital Signal Processing Lab

- ▶ MATLAB Software
- ▶ Texas Processor based DSP modules
- ▶ Integrated Development Environment for Texas DSP Processor
- ▶ Image acquisition set up containing /Industrial thermo vision camera/ Cameras illumination sources.
- ▶ Image Processing Software.
- ▶ Sensors of Different types.
- ▶ Universal Programmer
- ▶ EPROM eraser
- ▶ Data Acquisition modules

# Digital Signal Processing Lab





# Details of other major equipment in Labs

Laboratory Name	Major Equipment
Embedded System Design	Embedded/ PLC Trainer Kits
	Flow code V-6 s/w (10 users)
	Flow Code V-5 10 Users
Electronic Service Centre - PCB	PCB PTH Unit



# Smart Class Room



# Department Library

- ▶ No of Books : 154
- ▶ Ph.D/ M.E thesis Reports : 666

# Ongoing Activities

- ▶ STCs and FDPs for working professionals and faculties.
- ▶ M.E. ECE
- ▶ ME ECE (AI)
- ▶ PhD and M.E Research Work
- ▶ PG Diploma
- ▶ Curriculum Design and Instruction Material Development
- ▶ Consultancy and Extension Services
- ▶ Industry Partnered R & D
- ▶ Internal Revenue Generation (IRG)

## **STC Details**

### **(Last 5 years details)**

<b>Session</b>	<b>No of programs (Contact Mode)</b>	<b>No of teachers trained</b>	<b>No of programs (ICT Mode)</b>	<b>No of teachers trained</b>
2020-21	- NA -	- NA -	28	6066
2019-20	12	130	08	890
2018-19	22	308	09	1528
2017-18	18	191	03	1018
2016-17	18	344	06	1181
2015-16	14	198	04	1603

### Total ME produced (last 15 years)

<b>Batch</b>	<b>Mode</b>	<b>No of students admitted</b>	<b>No of students successfully completed</b>
2019-20	Regular	09	Pursuing
2019-20	Modular	03	Pursuing
2018-19	Regular	02	Pursuing
2018-19	Modular	10	Pursuing
2017-18	Regular	16	15
2017-18	Modular	11	Pursuing
2016-17	Regular	18	17

2016-17	Modular	12	01
2015-16	Regular	19	17
2015-16	Modular	19	03
2014-15	Regular	18	17
2014-15	Modular	31	21
2013-14	Regular	15	13
2013-14	Modular	29	20
2012-13	Regular	14	13
2012-13	Modular	31	17
2011-12	Regular	18	17

2011-12	Modular	34	25
2010-11	Regular	13	12
2010-11	Modular	39	23
2009-10	Regular	14	11
2009-10	Modular	27	27
2008-09	Regular	13	12
2008-09	Modular	26	17
2007-08	Regular	13	08
2007-08	Modular	25	23
2006-07	Regular	15	12
2006-07	Modular	25	16
2005-06	Regular	13	10
2005-06	Modular	25	15



# PhD Guidance

Student	Title of Research work	Year of completion
Chintakindi Vidya Sagar	Development of Microstrip Antenna using PSO-NFDTD for Breast Cancer Detection	2010
G.V.R.S. Sastry	Some Studies & Development of Particle Swarm Optimization Driven Bacteria Foraging Technique to Optimize Artificial Neural Network for Breast Cancer Detection	2010
Kamalakar Manikrao Bakwad	Development of Hybridized Soft Computing Techniques for Image and Video Quality Enhancement	2011
M.R. Lohokare	Development and Fusion of Biogeography-Based Optimization Technique for Antenna Design and Video Processing	2013
P.K. Patra	Design and Development of Wideband, High Gain, Planar and Metamaterial Antennas for Space and Medical Applications	2013
J.G. Joshi	Design and Development of Antenna and Antenna Array using Metamaterial	2014
Rajesh Mehra	FPGA Implementation of Optimized DDC and DUC for Software Defined Radios	2015

D.G. Jadav	Development of Memetic Algorithm and its Application in Bio-Medical Signal Processing	2016
Balwinder Singh	Development and Optimization of Fractal Patch Antennas for Medical and Communication Applications	2016
Ajay Abrol	Development of Hybrid Neuro-Computing Technique for Analysis of Effect of Electromagnetic Radiations on Electrocardiogram	2019
Danvir Mandal	Design and Development of Multiband Antennas and Their SAR Evaluation for Wearable Sensor	2019
Pushkar Mishra	Design and Development of Meta-Fractal Antenna for Remote Guidance.	2019
Garima Saini	Development of Optimum Antenna with Reduced Size & High Gain for Personal Communication	2020

## Instructional materials developed, Print and non print

<b>Print</b>		
<b>Title</b>	<b>Publisher</b>	<b>Year of publication</b>
Lab Manual on Programming of Arduino using TINKERCAD	NITTTR, Chandigarh	2020
Digital System Design using FPGA	NITTTR, Chandigarh	2019
Text Book on Solar Powered Cascaded Multilevel Inverter, Using MATLAB and FPGA Based Spartan 3A	DP Board, Lambert. Academic Publication, ISBN: 978-613-9-99450-0, 2018	2018
PIC Microcontroller using Flow Code	NITTTR, Chandigarh	2018
Introduction to Optometric	NITTTR, Chandigarh	2018
ASIC Design	NITTTR, Chandigarh	2017
Synopsys Custom Designer Tool	NITTTR, Chandigarh	2017
Lab Manual on Embedded System Design using Flowcode 6	NITTTR, Chandigarh	2017
Digital Image Processing	NITTTR, Chandigarh	2016
HFSS Module-I	NITTTR, Chandigarh	2016

Embedded System Design using Flowcode	NITTTR, Chandigarh	2016
Module on Semi Custom VLSI Design	NITTTR, Chandigarh	2016
Module on ASIC Design	NITTTR, Chandigarh	2016
Lab Manual on Embedded System Design using Flowcode	NITTTR, Chandigarh	2016
Lab Manual on Digital System Design	NITTTR, Chandigarh	2015
Optical Fibre Communication	NITTTR, Chandigarh	2015
Data Communication Network	NITTTR, Chandigarh	2015
Digital Signal Processing	NITTTR, Chandigarh	2015
Embedded System Design	NITTTR, Chandigarh	2015
Wireless Mobile Communication	NITTTR, Chandigarh	2015
Lab Manual on Embedded Systems using Flowcode v6	NITTTR, Chandigarh	2014
Lab manual on Wireless Sensor Networks	NITTTR, Chandigarh	2012
Mobile Computing	NITTTR, Chandigarh	2011
Computer Networks	NITTTR, Chandigarh	2011
Signal Processing with MATLAB	NITTTR, Chandigarh	2011
MATLAB with Applications	NITTTR, Chandigarh	2011
Wireless and Mobile Communication	NITTTR, Chandigarh	2011
GSM to GPRS	NITTTR, Chandigarh	2011

DSP using MATLAB	NITTTR, Chandigarh	2011
Introduction to Embedded System	NITTTR, Chandigarh	2011
Introduction to System Designing	NITTTR, Chandigarh	2011
Optimization Techniques	NITTTR, Chandigarh	2011
MATLAB Based ADSP	NITTTR, Chandigarh	2011
GSM and 3 G Communication	NITTTR, Chandigarh	2011
ANN with MATLAB	NITTTR, Chandigarh	2011
Introduction to Wireless LANs	NITTTR, Chandigarh	2011
Advanced VLSI Design	NITTTR, Chandigarh	2011
FPGA Based DSD	NITTTR, Chandigarh	2011
Advanced Embedded System	NITTTR, Chandigarh	2011
GSM Communication	NITTTR, Chandigarh	2009
Industrial Automation using PLCs & SCADA	NITTTR, Chandigarh	2009
Advanced VLSI Design	NITTTR, Chandigarh	2009
Concepts of ANN & Fuzzy Logic	NITTTR, Chandigarh	2009
TCP/IP based Networking	NITTTR, Chandigarh	2009
GSM and CDMA	NITTTR, Chandigarh	2009
MATLAB based VLSI Design	NITTTR, Chandigarh	2009

Wireless and Mobile Communication	NITTTR, Chandigarh	2009
Signal Processing with MATLAB	NITTTR, Chandigarh	2009
3G Communication	NITTTR, Chandigarh	2009
Computer Networking	NITTTR, Chandigarh	2009
Digital Communication	NITTTR, Chandigarh	2009
Antenna Engineering	NITTTR, Chandigarh	2009
Wireless LANs	NITTTR, Chandigarh	2009
Image Processing with Prospective Applications in Medicare	NITTTR, Chandigarh	2009
FPGA based Digital System Design	NITTTR, Chandigarh	2009
Embedded System Design	NITTTR, Chandigarh	2009
Soft Computing Technique and their Applications	NITTTR, Chandigarh	2009
MATLAB - I - (Basics of MATLAB)	NITTTR, Chandigarh	2008
Design and Analysis of Sequential Machines	NITTTR, Chandigarh	2008
GSM – Global System of Mobile Communication	NITTTR, Chandigarh	2008
RS View-32 Based Advanced SCADA	NITTTR, Chandigarh	2007

CDMA - Code Division Multiple Access	NITTTR, Chandigarh	2008
MATLAB-I – Basics of MATLAB	NITTTR, Chandigarh	2007
FPGA Based VLSI Design – Implementation & Simulation	NITTTR, Chandigarh	2007
Allen Bradley SLC-500 Instruction - Set-I	NITTTR, Chandigarh	2007
SCADA using RS View -32	NITTTR, Chandigarh	2006
MATLAB-1	NITTTR, Chandigarh	2006
Optical Fiber Sensors	NITTTR, Chandigarh	2006
Programmable Logic Devices in Digital System Design	NITTTR, Chandigarh	2006



## Non Print Material

Type of material	Title	Year
Video Lecture through ICT	Digital filter design using MATLAB (10 Lec)	2020
Video Lecture through ICT	Biomedical instrumentation & Applications (3lect.)	2020
Video Lecture through ICT	Digital Signal processing fundamentals (10 lec.)	2020
Video Lecture through ICT	Image processing using MATLAB (10 lec.)	2020
Video Lecture through ICT	Basic Matlab programming	2020
Video Lecture through ICT	Image & Embedded Processing	2020
Video Lecture through ICT	Overview of flexible & Wearable antenna	2020
Video Lecture through ICT	Development of hybrid soft computing algorithm for antenna	2020
Video Lecture through ICT	Introduction to optically transparent antenna	2020
Video Lecture through ICT	Broadband & New Radio Technology	2020
Video Lecture through ICT	Features and Architecture of Key Technology for Broadband Transformation	2020
Video Lecture through ICT	Introduction to Broadband Transformation and its Concepts	2020
Video Lecture through ICT	Multi-Gate Semiconductor Devices	2020
Video Lecture through ICT	Introduction to VLSI Design	2020
Video Lecture through ICT	Low Power Memory Design	2020
Video Lecture through ICT	Nanotechnology and Nanoelectronics	2020
Video Lecture through ICT	Developments in Electronics Engineering	2020
Video Lecture through ICT	VLSI Design Flow	2020

Type of material	Title	Year
Video Film	Embedded System and Controllers	2020
Video film	Sensor Networks and applications	2020
Video film	Embedded Processing Fundamentals	2020
Video film	Real world Applications	2020
Video film	IoT and Embedded Systems	2020
Video film	IoT Based WSNs	2020
Video film	IoT and WSNs	2020
Video film	Research Issues and Challenges in WSNs	2020
Video film	Embedded System and Controllers	2020
Video film	Sensor Networks and applications	2020

Online Material	Unit-1 of Module-2 ‘Professional Ethics & Sustainability (AICTE-NITTT Scheme) Contributed A case study on ‘Community Radio Station (CRS): A Case of Social Responsibility’ available at SWAYAM platform	2019
Video Lecture through ICT	New Radio Technology	2019
Video Lecture	Research Areas in Wireless Communication	2018
Video film	EDA Tools	2017
Video film	Design Optimization	2017
Video film	2G Air Interface	2017
Video film	2G and 3G Architecture	2017
Video film	Embedded Systems and Controllers	2017
Video film	Embedded in Wireless Sensor Networks	2017
Video film	Real Time Operating systems	2017
Video film	FPGA Implementation for Digital Systems	2017
Video film	Programmable Logic Devices	2017
Video Film	Programmable Logic Devices	2017
Video Film	FPGA Implementation of Digital Systems	2017
Video film	Artificial Neural Network	2016
Video film	2G Vs 3G	2016
Video film	Optical Fiber Communication	2016
Video film	Wireless and Mobile Communication	2016
Video film	VLSI Design	2016

Video film	Embedded World	2016
Video film	Embedded Systems and Embedded Processors	2016-2017
Video film	Embedded in Wireless Sensor networks	2016-2017
Video Films	271 video recordings for E Content Generation projects in Hindi for Electronics Department	2015-2016
Video film (through ICT)	3G Technologies	2015
Video film (through ICT)	4G/LTE Network	2015
Video film (through ICT)	GSM to 3G	2014
Video film (through ICT)	Module of Instructional Planning and Delivery NMEICT	2014
Video film (through ICT)	Introduction to Sensors	2014
Video film (through ICT)	Embedded System Design–Part 2	2014
Video film	Nanoscale VLSI Circuit Design: Timing Issues and Solutions	2014
Video film (through ICT)	VLSI System Design	2014

Video film (through ICT)	Circuit Simulation Using Multisim	2014
Video film (through ICT)	VLSI Overview	2013
Video film (through ICT)	Recent VLSI Trends	2013
Video film (through ICT)	VLSI Challenges	2013
Video film (through ICT)	Embedded Design	2013
Video film (through ICT)	Embedded Applications	2013

- **E-Content Generation in Hindi Sponsored by IRDT, Kanpur**
- Total No. of Video Recordings: 271

## Curriculum Designed

Title	Year	Beneficiary
Book Chapter on Conduction Mechanism and Performance Evaluation of Nanoscale Semiconductor Devices, “Book: Nanotechnology: Advances and Real-Life Applications, CRC Press, Taylor & Francis.	2020	International
Book Chapter on “Nanowire FET Based Photodetector Design”, “Book: Innovative Applications of Nanowires for Circuit Design, IGI Global Publisher.	2020	International
Book Chapter on Implementation of Fractional Frequency Reuse Schemes in LTE-A Network” Lecture Notes in Networks & System book Series (LNNS)	2018	International
Curriculum designed for ME ECE	2020	Panjab University
Curriculum designed for ME (AI)	2020	Panjab University
Devising module, course content and duration for coaching/training to unemployed/unskilled youth for jobs in Private sector under Punjab Ghar Ghar Rozgar & Karobar Mission	2019	Punjab State
Study schemes of Curricula diploma programme	2019	Haryana State
Curriculum Workshop for developing the curriculum structure and contents for UP state	2019	UP
Curriculum for ME (ECE) with specialization in Artificial Intelligence for NITTTR, Chandigarh	2019	All States
Devising module, course content and duration for coaching/training to unemployed/unskilled youth for jobs in Private sector under Punjab Ghar Ghar Rozgar & Karobar Mission	2019	Punjab State

<b>Title</b>	<b>Year</b>	<b>Beneficiary</b>
Study schemes of Curricula diploma programme	2019	Haryana State
Development of Curriculum of various Higher-order modules of AICTE-NITTT scheme	2019	All states
Developing the curricula structure and contents of Various diploma programmes	2018	UP state
Validation of curriculum contents of 6 diploma courses	2018	Haryana State
Developing Curriculum Structure	2018	UP state
Finalize the Lab equipment for various diploma courses	2018	UP state
Workshop for design of curriculum for integrated diploma programme in Electronics and Communication Engineering for MRSPTU, Bathinda (Pb	2017	Punjab State
One day workshop for finalizing the curriculum for diploma course in ECE for Haryana State	2017	Haryana State
Curriculum design for Integrated Diploma programme for MRSPTU, Bathinda	2017	Punjab State
Participated in NSQF alignment of diploma programme in Electronics & communication Engineering”	2016	



Participated in Annual Workshop for Preparing O.Plan for Haryana State on 16 November, 2016	2016	Haryana
Participated in Annual Workshop for Preparing O.Plan for Punjab and Chandigarh State on 18 <sup>th</sup> November, 2016	2016	Haryana
Participated in Workshop on Review of Electronics & Communication Laboratory Manuals	2015	All States
Participated in Workshop on e-lectures on Electrical & Electronics	2014	UP State
Revised Embedded System Design Curriculum	2014	ME Students
Preparing list of major project works for the diploma programme in ECE	2013	Punjab State
Participated in CDC Workshop on Three years Diploma Program in “Electrical & Electronics Engineering’ for Punjab State on 24-25 May, 2012 at NITTTR, CHD	2012	Punjab
Revising the Curriculum of Diploma Programme in Electrical and Electronics Engineering	2012	Punjab State

## Research projects received/ submitted (Recent)

PI/Team	Title of Project	Sponsor- ing body	Amt. (in Lacs)	Year of grant submission of project	Status [Completed/ in progress]
Dr. Balwinder Raj	Design and Development of Junctionless Nanowire TFET Biosensor	SERB	37	2019-22	Ongoing
Dr. Amod Kumar, Dr Garima Saini	Generation of autofocused image for behind-the-wall object	CSIR	15.76	2019	Submitted
Dr. Amod Kumar and Dr Garima Saini	Design and Implementation of non- contact system for cardiac activity monitoring	DST	42.15	2019	Submitted
Dr. Amod Kumar	Quantification of Pain using Biosignals	CSIR	22.28	2019	Submitted
Dr. Amod Kumar	Wheelchair with map based navigation for hospital environment	DST	34.65	2019	Submitted
Dr. Amod Kumar, Dr Balwinder Singh and Dr Meenakshi Sood	Artificial Intelligence based Digital phenotyping for suicide Intervention	DST	20	2020	Submitted
Dr S S Gill and Dr Balwinder Raj	Nanoscale Tunnel FET based Low Power SRAM Cell Design	SERB	60.50	2020	Submitted
Dr. Balwinder Raj	Design and Development of Charge Plasma based Vertical TFET Biosensor	SERB	35.92	2020	Submitted

Dr Garima Saini	Patent Analysis of the Technologies Developed by Central and State Funded Degree Level Technical Institutes of Haryana, Punjab, Rajasthan, Himachal Pradesh, Delhi & Chandigarh	DST	33.70	2019	Submitted
Dr Garima Saini and Dr. Mala Kalra	IoT based Pollution Monitoring System for Smart Cities	DST & Renewable Energy	5	2019	Submitted
Dr. Kanika Sharma Dr. S.S. Gill	Design and Development of Low Cost Sensor Network for Detecting Pollutants for Health Monitoring	NCSTC, DST, New Delhi	22.46	2019	Submitted

## AICTE Proposals/Schemes

PI/Team	Title of Project	Scheme	Amount
Dr. Balwinder Singh	Flexible and Wearable Antennas: Recent Advancements, Fabrication Techniques and Applications,” (Thrust Area: Wearable Devices)	ATAL FDP	Rs. 93,000/- 5-Days Oct. 12-16, 2020
Dr. Garima Saini	Proposal to Conduct ATAL FDP on “Engineering Applications of Artificial Intelligence and Machine Learning”	Submitted to AICTE Trainin g and Learning to conduct FDP	Submitted
Dr. Garima Saini	RF characterization of heterogeneous antenna substrate materials for wearable applications	Submitted to AICTE to conduct RPS under AQIS	Submitted
Dr. Garima Saini	Proposal for conducting AICTE Short Term Training Programme Title- Artificial Intelligence in IoT under AQIS	Submitted to AICTE to conduct STTP under AQIS	Submitted

# Extension Services

Team	Name of Project	Beneficiary	Date/Year
Dr. Balwinder Raj	Delivered lecture on “Digital Library” in STC organized by Society of Materials and Mechanical Engineers (SO MME)	Bathinda, Punjab (India)	02 June 2020
Dr. Balwinder Raj	Delivered lecture on “Nanoelectronic Devices: Problems and Possible Solutions” in online STC organized by in department of ECE	ARASU ENGINEERING COLLEGE, Kumbakonam, Tamil Nadu,	04 Aug 2020
Dr. Balwinder Raj	Delivered lecture on Smart Sensor Design in STC organized by Department of ECE, Sant Longowal Institute of Engineering and Technology, Longowal	Punjab	3 Sep, 2020.
Dr. Balwinder Raj	Delivered lecture on Multi-Gate Nanoelectronics Devices for Low Power Design, in TEQIP- III sponsored short term course entitled "Low Power VLSI Design for Communication Systems and Networks (LVCSN'20)	ECE Dept., NIT Jalandhar,	17 Sep 2020
Dr. Balwinder Raj	Expert lecture in five days online workshop on "Emerging Trends in Nano Technology“ lecture topic Multi-Gate Semiconductor Devices: Challenges and Opportunities	Rajasthan Technical University, Kota and Jaipur Engineering College & Research Centre (JECRC), Jaipur, under TEQIP-III	21 Sep 2020

Team	Name of Project	Beneficiary	Date/Year
Dr. S.S. Gill Dr. Balwinder Raj Dr. Kanika Sharma	Embedded Systems using Arduino for students of University of Jammu	Jammu	2019
Dr. Balwinder Singh	Delivered lecture on 'MATLAB and GUI Creation' AICTE sponsored FDP on Recent Trends in Image Processing Techniques held during 30-12-2019 to 03-01-2020 at GNDEC Ludhiana	GNDEC Ludhiana	01-01-2020
Dr. Balwinder Singh	Delivered lecture on 'Wireless Communication Technologies for IoT' Faculty Development Program jointly organised by Rajasthan Technical University, Kota and Poornima College of Engineering, Jaipur on "MOBILE ROBOTICS & INTERNET OF THINGS".	Online	16-09-2020
Dr. Balwinder Singh	Delivered lecture on 'Mendeley: Reference Management Tool and Report Writing' Refresher Course in Information Technology, Awareness & Applications (Interdisciplinary) from October 21 to November 3, 2020. UGC Human Resource Development Centre of Guru Nanak Dev University, Amritsar	Online	31-10-2020
Dr. Balwinder Singh	Delivered lecture on 'Development of Hybrid Soft Computing Algorithms for Fractal Antenna Design' online Short term training program (STTP) "Antenna Design and Analysis using Mathematical Solvers", being held during <b>29<sup>th</sup> October to 3<sup>rd</sup> November, 2020, AITAM, Tekkali, AP</b>	Online	03-11-2020
Dr. Balwinder Singh	Delivered lecture on 'Development of Hybrid Soft Computing Algorithms for Miniature Antennas' (STTP)on "Design and Simulation of Miniature Antennas for IoT Applications-DSMAIA-2020" from 23rd November, 2020 to 28th November, 2020 MVGR College of Engineering, AP	Online	28-11-2020
Dr. Balwinder Singh	Delivered lecture on 'Overview of Flexible Wearable Antennas' ATAL FDP on Wearable Devices from 30.11.20 to 4.12.20 Sri Ramakrishna Institute of Technology, Coimbatore	Online	30-11-2020

<b>Team</b>	<b>Name of Project</b>	<b>Beneficiary</b>	<b>Date/Year</b>
Dr. Kanika Sharma	Arduino Programming and Hardware Development for Students of Pbi. University, Patiala (Punjab)	Punjab	<b>2020</b>
Dr. Kanika Sharma	ME Thesis Viva-voce of PEC (Deemed To Be University), Chandigarh	UT	<b>2020</b>
Dr. Garima Saini	Invited talk at IETE student chapter event	MM university, Sadopur	<b>2014</b>
Dr. Garima Saini	Invited talk at IETE	Chandigarh Centre	<b>2015</b>
Dr. Garima Saini	Reviewer – IEEE International Conference on Advances in Computing, Communication & Automation	Dehradun	<b>2016</b>
Dr. Garima Saini	Invited talk on Mobile Communication	GP Hisar (Haryana)	<b>2017</b>
Dr. Garima Saini	Invited talk on Wireless & Mobile Communication	Chandigarh Engineering College, Landran	<b>2017</b>
Dr. Garima Saini	Member Selection Committee	NIELIT, Mohali Campus	<b>2018</b>
Dr. Garima Saini	Reviewer – Applied Science & Engineering	Panjab University, Chandigarh	<b>2018</b>
Dr. Kanika Sharma	Reviewer - International Conference on IOT Inclusive Life (ICILL)	NITTTR, Chandigarh	<b>2019</b>
Dr. Kanika Sharma	Reviewer - International Journal of Cloud Computing (IJCC) INDERSCIENCE	Punjab	<b>2019</b>
Dr. Garima Saini	Reviewer - International Conference on IOT Inclusive Life (ICILL)	NITTTR, Chandigarh	<b>2019</b>
Dr. Garima Saini	Reviewer - International Conference on Innovation Computing & Sciences	CGC, Landran, Punjab	<b>2019</b>
Dr. Garima Saini	Reviewer-International Conference on Integrated Inter-disciplinary Innovations in Engineering	Panjab University, Chandigarh	<b>2020</b>



<b>Team</b>	<b>Name of Project</b>	<b>Beneficiary</b>	<b>Date/Year</b>
Dr. Garima Saini	Delivered lecture on “5G Technology” in AICTE sponsored ATAL FDP on “Mobile Computing and Wireless Networks organized by Department of Information Technology, MIET, Meerut	MIET, Meerut, Uttar Pradesh	07 Sep. 2020
Dr. Garima Saini	Delivered lecture on “New Radio technology for 5G Communication ” TEQIP-III Sponsored One Week Online Faculty Development Program on “Emerging Trends in Electronics and Communication”organized by Department of ECE	University Institute of Engineering & Technology, Chandigarh & Govt. College of Engineering & Technology, Jammu.	06 Aug 2020
Dr. Garima Saini	Delivered lecture on “Applications of MAT LAB in various field” in TEQIP- III sponsored FDP on “MATLAB and Its Applications” organized by Rajasthan Technical University, Kota and Sri Balaji College of Engineering & Technology (SBCET), Jaipur,	Rajasthan Technical University, Kota and Sri Balaji College of Engineering & Technology (SBCET), Jaipur	3 Sep 2020.

## Conferences/Seminars organized (Recent)

Conference/ Seminar	Title
International Conference	Electronic Design Innovations and Technologies (EDIT-2015)” 27-28 April, 2015
National Seminar	Digital India: Services and Solutions In Collaboration with Telecom Regulatory Authority of India (TRAI) Jaipur on 13 <sup>th</sup> September, 2018
Seminar for ME Students	CST Simulation Software On 23.01.2018 for ME Students
National Conference	National Conference on Bio Medical Engineering (NCBE-2020) from Jan 22-24, 2020 [Financial Support from GOI, Ministry of Science and Technology Department of Scientific and Industrial Research ]

# Students Activities

- ▶ Student Chapter “ELECTROVYOMIC Prof. (Dr.) Er. Meng Joo of Nanyang Technological University, Singapore ” was inaugurated on 29th April 2015.
- ▶ Experts Lecture on “Cognitive University, Singapore.
- ▶ Industrial Visit for ME Regular 2014 Batch students
- ▶ One day Industry oriented training on Embedded System for M.E. Regular 2014 batch.
- ▶ Technical quiz for ME Regular Students on 30 July 2015 Industrial Visit for ME Regular 2014 Batch students to BSNL, Chandigarh
- ▶ One day Industry oriented training on Embedded System by expert from Advance Technology Ltd. for M.E. Regular 2014 batch
- ▶ Invited talk on “Radio Frequency Planning and Optimization for WCDMA by Director, Telcocrats Technologies, Punjab for ME batch 2015.
- ▶ Industrial study visit to BSNL for the study of BTS, BSC and MSC for ME Students
- ▶ Lecture on IPR by Sh. Abhishek Syal, Sr. Marketing Intelligence Analyst EMC Global Head Quarter, USA on 16.02.2016

# Achievements / Focus

- Enhanced Consultancy work in 2020.
- Focus on Industry supported training programmes.
- QIP Centre for Ph.D for Engineering College faculty allotted
- Launch of Industry collaborative Project based / Virtual Lab integrated Trainings.
- Started New M.E program (Artificial Intelligence)-2020.
- Got approval for PGD under NSQF scheme of UGC-2020.
- Ongoing research project funded by SERB-DST (37 Lakhs ).
- E-Content Generation in Hindi (Total No. of Video Recordings: 271) in consonance with NEP-2020.

## Consultancy projects (Year 2020)

PI/Team	Title of Project	Client	Amount
Dr Balwinder Singh	STC on Engineering Applications of Machine Learning and Artificial Intelligence (CP-122)	Govt. College of Engineering and Technology, Jammu and Kashmir	Rs. 3 Lakhs
Dr. S S Gill, Dr Balwinder Singh, Dr. Balwinder Raj, Dr Kanika Sharma	Student Training on Embedded Systems	Jammu and Kashmir	Rs. 40000/-
	Student Training on Electronics Technology	Punjabi University	Rs. 18000/-
Dr. S S Gill and Dr K G Srinivasa	Training of ITI instructors (04 Projects)	Uttarakhand State	Rs. 8 Lakhs
Dr. S S Gill and Dr K G Srinivasa	Industry Collaborative Project based Training (02 Projects)	All States	Rs. 4 Lakhs
Dr Balwinder Singh	Industry Partnered STCs	All States	Rs. 56000/-

## Budget details (Allocation and Utilization) Last 5 years

	ECE	
Year	Budget allotted ( Rs. Lakhs)	Budget Utilized (Rs. Lakhs)
2015-16	70.00	40.15
2016-17	48.00	14.53
2017-18	31.00	16.46
2018-19	125.00	26.47
2019-20	45.00	0.26
2020-21	47.60	In process

## New equipment purchased (Last 5 years)

Year of Purchase	Name of equipment	Cost ( Rupees)
<b>ANTENNA DESIGN LAB</b>		
15.06.2015	Spectrum Analyzer	121933.00
31.03.2015	PCB Designing Software ( Orcad PCB Designer) Industrial Version	422000.00
31.03.2015	PCB Prototype Machine with Automatic Function	1793500.00
04.03.2016	HFSS Software (5users)	1179999.45
10.12.2018	Antenna Gain Measurement Setup	1134000.00
09.01.2019	CCTV Camera with Accessories	87413.00
<b>Digital Signal Processing lab (DSP)</b>		
29.04.2015	Led Display ( Touch Screen) '80'	546042.00
08.12.2015	Mauratec Printer Japan	73279.00
03.08.2015	Smart Lecture Podium	171861.00
7.09.2015	Professional LED display with Integrated touch Screen	546042.00
15.02.2016	Image Acquisition/ Developer Software	610000.00
31.03.2016	HP Laptop i7 Window 8.1	306075.00
09.01.2019	CCTV Camera with Accessories	87413.00

<b>Year of Purchase</b>	<b>Name of equipment</b>	<b>Cost ( Rupees)</b>
<b>COMMUNICATION ENGINEERING LAB</b>		
28.03.2015	Flow code V-6 s/w (1users)	325000.00
28.03.2015	2G & 3G Trainer Board	226932.00
28.03.2015	EB 118 Mobile phone Training Solution	160000.00
01.11.2018	AADHAR Biometric Attendance System	17946.00
21.03.2018	Wireless Insite s/w 05 users	15,69750.00
26.03.2018	HP LaserJet colour PrinterM-154A	22,0000.00
14.03.2018	HP Desktop 600G3 MT i7	270500.00
06.12.2018	HP desktop 280G -4	1124118.00
09.01`.2019	CCTV Camera with Accessories	87413.00
<b>VLSI DESIGN LAB</b>		
08.10.2015	Desktop i7 Computer With HP Server	1161626.00
01.10.2015	Cadence Software (20 users)	25,63650
30.03.2016	T-Cad software (5 users)	1613250
01.03.2016	BPE 5 KVA online Ups	122683.00
21.03.2018	Fluxim SetFos Software	1884750.00
09.01`.2019	CCTV Camera with Accessories	87413.00



<b>Year of Purchase</b>	<b>Name of equipment</b>	<b>Cost ( Rupees)</b>
<b>Proposed AI Lab</b>		
14.03.2018	HP 600MT-G3MT Desktop	659000.00
<b>Embedded System Design Lab</b>		
15.10.2015	HP Laser Jet Colour Printer	65625.00
09.01`.2019	CCTV Camera with Accessories	87413.00
<b>ESC /PCB LAB</b>		
20.02.2015	SMD Hot AIR Gun	8663.00
13.07.2015	Water Dispenser	7290.00
24.08.2015	PCB PTH Unit	995832.00
30.03.2016	Video Confering Camera with DSP	585000.00
31.03.2016	LG Display 55”	95377.50
31.03.2016	UPS 5KV	205183.00

The background of the slide features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic design.

## Sample OBE based Teaching and Evaluation being Followed

# Curriculum mapping

Subject: Advanced Digital Signal Processing

Sessional Question	Mapped with	Course Outcome	Thinking Skills
Q1. a) What is the need of DSP? Explain common features and functions related to DSP.	CO2	CO1: Design & Implementation of Different Transforms like: Fourier Transform, Z-Transform, DCT, Walsh Transform and Hadamard Transform	Remembering
b) Compare Laplace, Fourier and z-transform, for the difference equation: $y[n]-0.5y[n-1]=x[n]$ , with $x[n]=1, n \geq 0$ , and $y[-1]=1$	CO1	CO2: Design & implementation of Digital Filters like FIR, IIR.	Remembering Understanding Analysing Evaluating
Q2 a). Discuss DFT as linear transform. What is FFT and Derive Split Radix FFT algorithm.	CO1, CO3, CO4	CO3: Design & implementation of Multirate & Adaptive Systems	Remembering Understanding Analysing
b) What do you mean by Orthogonal Transform? What is DCT and How it is related with Karhunen-Loeve Transform?	CO1		Understanding Analysing
Q3. Write short notes on (i) Fixed point vs. Floating Point Processors (ii) Power Spectrum Estimation	CO2, CO4	CO4: Power Spectrum estimation & analysis	Remembering Understanding Analysing

# Curriculum mapping

Subject: Neural network & Fuzzy logic

Sessional Question	Mapped with	Course Outcome	Thinking Skills
Q1. a) With the help of a suitable diagram, discuss the functioning of simple artificial neuron	CO1	CO1: To understand fundamentals of neural networks and fuzzy logic	Remembering
b) what do you mean by Bidirectional Associative Memory? Explain difference between Autocorrelators and Heterocorrelators.	CO2, CO3	CO2: To understand Supervised learning and unsupervised learning	Reminding, Understanding Analysing
Q2. Discuss Back Propagation algorithm for multilayer network?	CO1, CO2, CO3	CO3: To solve research oriented problems in ANN	Reminding, Understanding Applying
Q3. $\{p_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}, t_1=1\}, \dots \{p_2 = \begin{bmatrix} -1 \\ 2 \end{bmatrix}, t_2=0\}, \dots \{p_3 = \begin{bmatrix} 0 \\ -1 \end{bmatrix}, t_3=0\}$ Describe Perceptron network to solve this problem	CO1, CO3, CO4	CO4: To design Neurodynamical models	Evaluating Creating Analysing

# Curriculum mapping

Sessional Question	Mapped with	Course Outcome	Thinking Skills
Q1. a) With the help of a suitable diagram, discuss the functioning of simple artificial neuron	CO1	CO1:To understand fundamentals of neural networks and fuzzy logic	Remembering
b) what do you mean by Bidirectional Associative Memory? Explain difference between Autocorrelators and Heterocorrelators.	CO2,CO3	CO2: To understand Supervised learning and unsupervised learning	Reminding, Understanding Analysing
Q2. Discuss Back Propagation algorithm for multilayer network?	CO1, CO2, CO3	CO3: To solve research oriented problems in ANN	Reminding, Understanding Applying
Q3. $\{p_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}, t_1=1\}, \cdot \{p_2 = \begin{bmatrix} -1 \\ 2 \end{bmatrix}, t_2=0\}, \cdot \{p_3 = \begin{bmatrix} 0 \\ -1 \end{bmatrix}, t_3=0\}$ Describe Perceptron network to solve this problem	CO1, CO3, CO4	CO4: To design Neurodynamical models	Understanding Evaluating Creating Analysing
Q1.a) Explain method of clustering of Vector Quantization. What are the disadvantages of this method.	CO1	CO1:To understand fundamentals of neural networks and fuzzy logic	Remembering Understanding
b) Explain the ART1 algorithm.	CO1, CO2	CO2: To understand Supervised learning and unsupervised learning	Understanding
Q2. Design ART algorithm to recognize the characters A,.B,B,C,D,E,F. Take $L=25, p=0.9, A=1, B=1.5, C=5, D=0.9$	CO3, CO4	CO3:To solve research oriented problems in ANN	Applying Analysing Evaluating Creating

# Internal/Continuous Assessment

- ▶ Sessional
  - ▶ Two sessional - 30 marks each
  - ▶ Average taken
- ▶ Assignments
- ▶ Seminar/ Quiz

Sessional 1 (30)	Sessional 2 (30)	Average	Assignment (10)	Seminar (10)	Total (50)

## Seminar Marks Distribution

Subject Content (2.5)	Designing of Presentation (2.5)	Presentation skill (2.5)	Query handling (1.5)	Quality of references (1)	Total (10)

## Weaknesses and Strategy to overcome

- ▶ From Training to research focus (M.E./Ph. D students)
- ▶ From STC funding to Research Projects
- ▶ From Local Tie-ups to International Tie-Ups
- ▶ From University defined curriculum to Innovative Flexible Curriculum
- ▶ From Traditional Programs to Innovative Programs
- ▶ From Instruction based to Job Oriented Teaching-Learning
- ▶ Industry partnered programs/ projects/ thesis
- ▶ Multi-disciplinary activities



## Proposed Activities

- ▶ The department intends to align its pedagogy and academic activities in line with New Education Policy 2020 which envisages to complement the process and vision of creating multidisciplinary quality education paradigm, a culture of innovation, and a highly skilled faculty. As a result, implementation of introducing the following new courses has been initiated recently:
  - ME in Electronics and Communication Engineering (AI)
  - PG/Advanced Diploma in Embedded Systems and IoT
  - Advanced Diploma Program in AI Systems
  - PG Diploma in Reconfigurable Electronics
  - PG Diploma in Rehabilitation Engineering
  - PG Diploma in Smart and Flexible Electronics

- ▶ Ph.D. (Engg.) students enrolment will be increased.
- ▶ Curriculum will be developed for new courses and syllabus will be revised for existing courses as per the needs of industry.
- ▶ Industry tie up will be strengthened which will not only help the department to take up sponsored research projects relevant to the industry but will also give an opportunity to M.E. and Ph.D. students to work on live problems for their thesis and Ph.D. programme.
- ▶ Labs in various disciplines will also be developed in collaboration with the industry so that students have the required skills to work in the industry when they pass out.
- ▶ The classroom and labs' work will be supplemented by quality MOOCs and other e-content instruction material.

# New Programmes Proposed

<b>Program</b>	<b>Proposed year of start</b>	<b>No of Seats</b>
ME in Electronics and Communication Engineering (AI)	2020-2021	18
PG/Advanced Diploma in Embedded Systems and IoT	2021-2022	60
Advanced Diploma Program in AI Systems	2021-2022	60
PG Diploma in Reconfigurable Electronics	2022-2023	60
PG Diploma in Rehabilitation Engineering	2023-2024	60
PG Diploma in Smart and Flexible Electronics	2024-2025	60

## Industry tie-up for new programs

Name of Industry
Semi-Conductor Laboratory, Department of Space, Govt. of India, S.A.S. Nagar (Punjab)
Tech Mahindra Limited Gateway Building, Apollo Bunder, Mumbai
Pink Tech Design Labs, New Delhi
EdGate Technologies Pvt. Limited, Bangalore
Telecom Sector Skill Council (TSSC), Delhi
M/s ABB India Limited, Bengaluru-560 055
Bio-medical Instrumentation Division, CSIO, Chandigarh
Advance Technology, Chandigarh
LM Health Care, Panchkula (Haryana)
Touch Techno, New Delhi

## External faculty identified for the new programs from Industry/IIT/NITs and other organizations

<b>Name of Expert</b>	<b>Organization</b>	<b>Area of Expertise</b>
Dr. B.K. Kaushik	ECE, IIT Roorkee	VLSI
Dr. S. Das Gupta	ECE, IIT Roorkee	VLSI
Dr. Manisha Pattanaik	IITM Gwalior	VLSI
Dr. Ashwani Rana	NIT, Hamirpur	VLSI
Dr. Santosh Kumar	IIT, Indore	VLSI
Dr. Jawar Singh	IIT Patna	VLSI
Dr. Sudhanshu Choudhary	NIT, Kurukshetra	VLSI
Dr. S.S. Rathod	SPIT, Mumbai	VLSI
Dr. Rajeeven Chandel	NIT, Hamirpur	VLSI
Dr. R.K. Sharma	NIT, Kurukshetra	VLSI
Dr. G.K. Sharma	IITM, Gwalior	VLSI
Dr. J.S. Ubhi	SLIET, Longowal	VLSI

Dr. Rohit. Y Sharma	IIT, Ropar	VLSI
Dr. Rajender Kumar	IIT, Delhi	VLSI
Dr. Mamta Khosla	NIT, Jalandhar	VLSI
Dr. Brajesh Rawat	IIT, Ropar	Nano Electronic Materials and devices
Dr. Brijesh Khumbani	IIT, Ropar	MIMO Wireless Communication UWB Communication System Sensor Networks
Prof. J.S. Sahambi	IIT, Ropar	Digital Systems Finite State Machines Analysis
Dr. Sandeep Sanghai	CSIO, Chandigarh	Embedded System
Dr. Amitava Das	CSIO, Chandigarh	Embedded System
Dr. Sanjeev Viridi	CSIO, Chandigarh	Embedded System
Dr. Abhishek	CSIO, Chandigarh	Embedded System
Dr. Gaurav Kumar	Magma Research & Consultancy Technologies Pvt. Limited, Ambala	Python Programming
Dr. Kanav Kahol	Pink Tech. Design, New Delhi	AI, Biomedical
Dr. Aparna Akula	CSIO, Chandigarh	Digital Image Processing
Dr. Amit Laddi	CSIO, Chandigarh	Digital Image Processing
Prof. Dilbag Singh	NIT Jalandhar	Bio medical
Prof. S. Pahuja	NIT Jalandhar	Bio medical
Dr. Karanveer Singh	NIT Jalandhar	Bio medical
Prof. Vinod Kumar	JPU, Kandaghat	Bio medical
Prof. Munna Khan	Jamia Millia Islamia, Delhi	Bio medical
Dr. Azat Shatru Arora,	SLIET, Longowal	Bio medical

Dr. Ravinder Aggarwal	TIET, Patiala	Bio medical
Sh. U.N Maurya	LM Healthcare, Punchkula	Bio medical
Dr. Anmol Bhondekar	CSIO Chandigarh	Machine Intelligence, FPGA
Dr. Sanjeev Kumar	CSIO Chandigarh	Sensors & Activator
Dr. Arun Kumar Singh	PEC, Chandigarh	Materials
Dr. Reshamjit Kaur	CSIO Chandigarh	A.I.
Dr. Satish Kumar	CSIO Chandigarh	Embedded System/ IoT
Dr. Suman	IIT Ropar	IoT
Dr. Ashwani Sharma	IIT Ropar	Antenna Design
Dr. Narayanan C Krishnan	IIT Ropar	A.I.
Sh. DevendraDhawan	Touch Techno	Embedded/ IoT
Dr. Brajesh Kaushik	IIT Roorkee	Chip design
Dr. Ravi Babu Mullaveesala	IIT Ropar	Biomedical Image
Mr. H.S. Jatana	SCL Mohali	VLSI Design
Dr. Balwinder Singh	C-DAC, Mohali	VLSI Design
Dr. A. Pattnaik	IIT Roorkee	Antenna Design, Soft Computing
Dr. B.K. Panigrahi	IIT, Delhi	Soft Computing

## External faculty already involved in the Department programs [Long Term and Short Term Programs]

<b>Name of Expert</b>	<b>Organization</b>
Dr. H.K. Sardana Dy. Director	CSIO, Sector 30, Chandigarh
Prof. V. Rihani, HOD, E&CE	Punjab Engineering College (Deemed University) Sector 12, Chandigarh
Prof. Sanjeev Sofat, Head (CSE)	Punjab Engineering College (Deemed University) Sector 12, Chandigarh
Prof. R.S. Kaler, Professor, ECE	Thapar University, Patiala (Pb)
Prof. Inderdeep Kaur Aulakh Asstt. Professor	UIET, Sector 25, Chandigarh.
Prof. Arvind Kumar Head, ECE Deptt.	UIET, Sector 25, Chandigarh.
Prof. HPS Kang	Central Instrument Lib Panjab University, Chandigarh
Dr.Tankeshwar,	Deptt. of Physics Panjab University, Chandigarh
Dr.Sukhwinder Singh, Head, Computer Sc. Deptt.	U.I.E.T., Panjab University, Chandigarh
Dr. A.K. Bhatti, Deptt. of Physics	Panjab University, Chandigarh



Dr. Amit Chhoudhary, Assistant Prof., ECE Deptt.	U.I.E.T., Panjab University Chandigarh
Dr. Nirmal Singh, Deptt. of Physics	Panjab University, Chandigarh
Dr. J.S.Shahi, Deptt. of Physics	Panjab University, Chandigarh
Prof. R.K. Singla, Department of Computer Science,	Panjab University, Chandigarh
Dr. Dilbag Singh, Assistant Professor, Deptt. of Instrumentation & Control Engg.,	Dr. B.R. Ambedkar National Instt. of Tech., Jalandhar-144 011 (Pb)
Dr. R.K. Sarin, Prof., & Head	Eltx. & Commn. Engg., Dr. B.R. Ambedkar National Instt. of Tech., Jalandhar-144 011 (Pb)
Dr. Kulbir Singh, Associate Professor, ECE Deptt.	Thapar University, Patiala (Pb)
Dr. Arun Khosla, Assistant Prof., ECE Deptt	Dr. B.R. Ambedkar National Instt. of Tech., Jalandhar-144 011 (Pb)
Dr. Paramjit Singh, Professor, Department of Chemical Engg.	Panjab University, Chandigarh
Dr.(Mrs.) Savita Gupta, C.S.E. Deptt.,	U.I.E.T., Panjab University, Chandigarh
Dr. I.B.S. Passi, Deptt. of Maths,	Punjabi University, Chandigarh

Dr. R.K. Khanna, ECE Department,	Thapar University, Patiala (Pb.)
Prof. Renu Vig, Professor	University Institute of Engg. and Technology Panjab University, Chandigarh
Prof. Vinod Kapoor	NIT, Hamirpur (H.P.)
Prof. Neena Gupta Professor	Panjab Engineering College, Sector-12, Chandigarh
Dr. V.K. Rattan	Deptt. of Chemical Engineering, P.U., Chandigarh
Prof. R.K. Wanchoo	Deptt. of Chemical Engineering, P.U., Chandigarh
Prof. C.S. Aulakh	Deptt. of Physics, P.U., Chandigarh
Dr. M.M. Gupta	Deptt. of Physics Panjab University, Chandigarh
Dr. Barjesh Rawat	IIT, Ropar (Punjab)
Dr. Brijesh Khumbani	IIT, Ropar (Punjab)
Dr. Sahambi	IIT, Ropar (Punjab)
Dr. Barjesh Kaushik	IIT, Roorkee, Uttarakhand
Dr. Jyoti Kedia	PEC, Chandigarh

Dr. Rita Mahajan	PEC, Chandigarh
Dr. Anil Kumar Rose	CCET, Chandigarh
Dr. Bhaskar Gupta	CCET, Chandigarh
Dr. K.G. Sharma	CCET, Chandigarh
Dr. Ashwini Sharma	IIT, Ropar (Punjab)
Dr. Brahmjit Singh	NIT, Kurukshetra (Haryana)
Dr. Satish Kumar	CSIR–CSIO, Sector-30 C, Chandigarh
Dr. Rajender	NIT, Kurukshetra (Haryana)
Dr. Arvind Kumar	NIT, Kurukshetra (Haryana)
Dr. Aparna Akula	CSIR–CSIO, Sector-30 C, Chandigarh
Dr. Rajesh K	Thapar University, Patiala (Pb)
Dr. Sanjeev Kumar	CSIR–CSIO, Sector-30 C, Chandigarh
Dr. Baban Kumar	CSIR–CSIO, Sector-30 C, Chandigarh
Dr. Baljit Singh	CSIR–CSIO, Sector-30 C, Chandigarh
Dr. Amit Laddi	CSIR–CSIO, Sector-30 C, Chandigarh
Dr. Amitava Das	CSIR–CSIO, Sector-30 C, Chandigarh
Er. Gaurav Kumar	Magma Research
Er. Gurmeet Sharma	IoT Labs
Er. Devender	Touch Techno

# 15 Year Future Plan

- ▶ Preferred destination for offering teacher focussed Electronics and interdisciplinary programmes
- ▶ Centre of Excellence in Artificial Intelligence applications in ECE
- ▶ Focused cutting edge technology STCs/FDPs, Students training at national and international levels
- ▶ Research initiations and projects in ECE based Specializations
- ▶ AI focused applications in Electronics Engineering product design
- ▶ Conferences/ Seminars on Latest Technologies
- ▶ Enhancement in Publications in SCI/Scopus Journals & h-index
- ▶ Up-gradation of Labs
- ▶ Enhancement in Revenue from special student trainings and consultancy work
- ▶ Focus on Rural Technology Product development and start-ups in-line with Atmanirbhar Bharat Objectives
- ▶ Networking with Industry and Research institutions in India and Abroad
- ▶ Joint projects and student/faculty exchange with networked Institutions
- ▶ Offer flexible, multidisciplinary and credit mapped programs in-line with NEP-2020
- ▶ Generation of IPR including patents
- ▶ Development of new generation instructional products
- ▶ Enhance enrolment in existing doctoral and PG programmes and offer new market driven programs

# Output (Academic)

Sl. No.	Indicator Description	Projection for next 5 Years	Projection for next 15 Years
1	Number of New Programmes	6	12
2	Number of New Students to be admitted	200	500
3	Number of International Students	5%	30%
4	Number of STCs to be conducted leading to certificate programmes	10	30
5	Number of programmes to be conducted for corporate professionals	03	20
6	Number of Ph.D. students	20	50
7	Total number of teachers to be trained	5000	15000
8	No. of students admitted for Online Courses	20	100
9	No. of Fellowship & Scholarship based admissions	10	20
10	Centre of Excellence (CoE)	01	03

# Output (Research)

S. No.	Parameters	Five Years	Fifteen Years
1	Number of Ph.Ds. (Completed)	03 Per Year	05 Per Year
2	Number of Publications in SCI/SCIE/SSCI/A&HCI indexed journals	15 Per Year	25 Per Year
3	Number of research papers/review papers/book chapters in SCOPUS indexed journals/Conference Proceedings	25 Per Year	50 Per Year
4	Number of Sponsored R&D Projects	01 Per Year	02 Per Year
5	Number of books/laboratory manuals published	05 Per Year	08 Per Year
6	Number of Patents/copyrights	01 Per Year	02 Per Year
7	Product Development	01 Per Year	01 Per Year
8	Number of conferences/ workshops/seminars etc. conducted to promote the research	04 Per Year	06 Per Year
9	Number of Industry Sponsored Projects	01 Per Year	02
10	Enhancement of number of industry and R & D Faculty	05 Per Year	10 Per Year
11	Student/Faculty Exchange	10	30
12	MoUs / Tie-ups (international/ National)	2 per year	2 per year
13	Technology Start-ups in socially relevant area	2	5

# Academic Outcomes

Sl. No.	Indicator Description	Projection for next 5 Years	Projection for next 15 Years
1	Number of students graduated	100%	100%
2	Average CGPA/% percentage of the graduating students	7.5	>8.0
3	Number of students who received campus placement offers (As a Percentage of Students who are graduated)	50%	>70%
4	Number of research papers published by the students (As a Percentage of Students who are graduated)	50%	>80%
5	Number of teachers who have enrolled for Certificate Programmes by attending STCs(As a percentage of total number of teachers who are participating in STCs)	30%	>60%
6	Faculty student ratio maintained	1:12	1:10
7	Accreditation	All Eligible Programmes	All Eligible Programmes

# Other Expected Outcomes

- ▶ Industry ready PG engineering workforce
- ▶ Skilled Human Resource Development for Enhanced Employability
- ▶ Enhancement in h-index
- ▶ Knowledge dissemination chain through trained engineering college faculty
- ▶ Implementation of Mission mode programmes of Govt of India like Digital India, smart cities etc.
- ▶ 21st century technology ready engineers
- ▶ Blended MOOCs programmes
- ▶ Foundation level training programmes
- ▶ Focus on certifications through MEME courses and recognition of Prior learning
- ▶ Enhance IRG (20 % enhancement each year)



# Link for Tour of the Department

<https://youtu.be/t19Z9CNwiYw>

