

Ministry of Electronics & Information Technology (MeitY) Government of India



WINTER COURSES through NKN (November - December 2017)



- Faculty Training
- Training and Consultancy
- Services for Industry
- Technical Incubation and Entrepreneurship
- Continuing Education for Students & Professionals

IIT Guwahati











mos



India is fast emerging as a world power in Information, Communications Technology and Electronics (ICTE) sectors. To complement its growth and further development, there is an ever-increasing need for trained professionals with specialization in this space. This includes training of professionals not only in existing and changing technologies but also in the fields of R&D and electronics manufacturing. This will specifically be aimed at the ICTE sector to create a substantial resource pool of talent and generate ample opportunities for entrepreneurs.

Ministry of Electronics & Information Technology (MeitY) has approved a scheme and set up Electronics and ICT Academies at 07 (seven) institutions viz. IIT Guwahati, IIT Kanpur, NIT Warangal, NIT Patna and IIITDM Jabalpur (all five under Category-A); and IIT Roorkee, MNIT Jaipur (both under Category B). The Ministry had earlier setup two ICT Academies at Tamil Nadu and Kerala respectively. Estimated cost and targets for the Electronics and ICT Academy in the two Categories for a period of four years are as under:

Category	Total Outlay	Internal Revenue Generation		
Category-A	Rs. 25 crore	Rs. 7.50 crore	Rs. 17.50 crore	16,000
Category-B	Rs. 10 crore	Rs. 3.00 crore	Rs. 7.00 crore	6,400

These Academies are aimed at faculty/mentor development and upgradation to improve the employability of the graduates, diploma holders in various streams, through collaboration of States/Union Territories. Each Academy is being provided funding support for four years and is expected to generate revenue by charging fee and taking up other activities to meet the recurring cost in a gradual manner and become self-sustainable by the end of fourth year onwards. All these Academies will cater to the requirements of identified neighbouring States and UTs also. Brief information about all the Academies is available at :

http://Meity.gov.in/content/scheme-financial-assistance-setting-electronics-andict-academies

Activities of the Academies

- Faculty development for
 - Specialized training with hands-on on basic and advanced level topics for Engineering streams and
 - Domain based training on use of ICT tools and techniques for non-engineering streams
- Training and consultancy services for industry
- Curriculum development for Industry
- Continuing Education programme for students / working professionals
- Design, Develop and Deliver specialized modules for specific research areas
- Providing advice and support for technical incubation and entrepreneurial activities

About Winter Courses

Faculty Development Programmes in core areas of Electronics and Information & Communication Technology (ICT) streams have been planned by academies for delivery during Winter (i.e., November - December 2017). All these winter courses will be offered through National Knowledge Network (NKN) by inviting experts from IITs, NITs, IIITs and other premier institutes/industries. In addition, local course coordinators at respective academies will take care of practicals and practice sessions. The following three courses would be taken up for delivery during forthcoming winter vacation.

S.No.	FDP Name	Dates	Global Coordinator Details	Participating Academies	Local Coordinator Details
1.	Object Oriented Programming	20-29, November 2017	Malaviya National Institute of Technology, Jaipur Prof. Vineet Sahula e-mail: vsahula.ece@mnit.ac.in Mobile: 954 9654 227	MNIT Jaipur	Dr. Pilli Emmanuel Shubhakar e-mail:espilli.cse@mnit.ac.in Mobile: 954 965 8131 Dr. Santosh Kumar Vipparthi e-mail:skvipparthi@mnit.ac.in Mobile: 954 965 8135
				IIT Guwahati	Dr. Gaurav Trivedi e-mail: trivedi@iitg.ernet.in
				IIITDM Jabalpur	Dr. Atul Gupta e-mail: atul@iiitdmj.ac.in Mobile: 942 515 2499
				NIT Patna	Dr. J. P. Singh email: jps@nitp.ac.in Mobile: 8521159014
				NIT Warangal	Dr. Rashmi Ranjan Rout e-mail: rashrr@nitw.ac.in Mobile: 833 296 9418
2.	Digital Signal Processing and Sensors	01-10, December 2017	National Institute of Technology, Warangal Dr. T. Kishore Kumar Dept. of ECE NIT, Warangal e-mail: kishorefr@gmail.com Mobile: 833 296 9353	NIT Warangal	Dr. T. Kishore Kumar e-mail: kishorefr@gmail.com Mobile: 833 296 9353
	anu sensors			IIT Guwahati	Dr. S. Rafi Ahamed e-mail:rafiahamed@iitg.ernet.in Mobile: 995 702 9847
				MNIT Jaipur	Dr. L. Bhargava e-mail: lavab@mnit.ac.in Mobile: 954 9654 231
					Dr. C. Periasamy e-mail: cpsamy.ece@mnit.ac.in Mobile: 954 9654 235
				NIT Patna	Dr. Puli Kishore Kumar e-mail: pulikishorek@nitp.ac.in Mobile: 703 329 7213
					Dr. Bharat Gupta e-mail: bharat@nitp.ac.in Mobile: 709 140 6964
				IIT Roorkee	Dr. Meenakshi Rawat e-mail: meenakshirawat_uofc@yahoo.ca Mobile: 897 987 9044

S.No.	FDP Name	Dates	Global Coordinator Details	Participating Academies	Local Coordinator Details
3.	Electronics December Technology Guv 2017 Dr. Praveen Ku e-mail: praveen_kumar@ praveen_kumar@ praveen_kumar@	December	Indian Institute of Technology Guwahati Dr. Praveen Kumar e-mail:	IIT Guwahati	Dr. Praveen Kumar e-mail: praveen_kumar@iitg.ernet.in Mobile: 361 258 2525
		praveen_kumar@iitg.ernet.in Mobile: 361 258 2525	MNIT Jaipur	Dr. Arun Verma e-mail: arun.ee@mnit.ac.in Mobile: 954 965 0188	
				Dr. Nitin Gupta e-mail: nitingupta.ee@mnit.ac.in Mobile: 954 965 8136	
			NIT Patna	Dr. Vimlesh Verma e-mail: vimlesh.verma@nitp.ac.in Mobile: 952 359 2768	
				Dr. Mala De email: mala@nitp.ac.in Mobile: 754 301 5121	
			NIT Warangal	Dr. M. Udaya Bhasker e-mail: ub@nitw.ac.in Mobile: 9703264416, 8332969293	

Target Beneficiaries: Interested Faculty of engineering/technical institutions are eligible to attend these winter courses.

Availability of seats at each offering Academy: Fifty (50) seats are available for each winter course to be offered at each academy. Participants will be selected based on first-cum-first-serve basis by each academy. Ten (10) more seats are also available for participants from industry. Selected participants will be communicated through e-mail / notified in E&ICT Academy websites.

Course duration: Each winter course is designed for 80 hours (Theory Lectures: 35 hours, Practicals: 35 hours, and Pedagogy, Soft skills & Demo teaching/Case study presentation by participants: 10 hours)

Accommodation: Boarding and Lodging will be provided at free of cost. No Travel Allowance will be paid to the participants.

Registration Fee for each Winter Course:

Faculty Members:	Rs. 3000/-	(Three Thousand rupees only)
Faculty of SC/ST Category:	Rs. 1500/-	(One Thousand five hundred rupees only)
Persons from Industry:	Rs. 9000/-	(Nine Thousand rupees only)

Mode of Payment

Academy Name	Participants belonging to States/ UTs	Payment through DD / Online transfer
NIT Warangal	Telangana, Andhra Pradesh, Karnataka, Goa, Andaman and Nicobar Islands, Puducherry	Demand Draft in favor of "Director, NIT Warangal" payable at NIT Warangal or <i>On-line Mode:</i> Account Name: Electronics & ICT Academy NITW Account No: 62423775910 and IFSC: SBIN0020149

Academy Name	Participants belonging to States/ UTs	Payment through DD / Online transfer
IIT Guwahati	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim	Demand Draft in favor of "Registrar, IIT Guwahati" Payable at Guwahati or On-line Mode: Account Name: IIT Guwahati R&D E&ICT ACADEMY Account No. 36071160089 and IFSC: SBIN0014262
IIITDM Jabalpur	Madhya Pradesh, Chhattisgarh, and Maharashtra	Demand Draft in favor of "Electronics and ICT Academy, IIITDMJ" payable at Jabalpur or On-line Mode: Account Name: Electronics and ICT Academy, IIITDMJ, Jabalpur Account No. 50302042708 and IFSC: ALLA0212433
MNIT Jaipur	Rajasthan, Gujarat, Dadra & Nagar Haveli, and Daman & Diu	Demand draft in favor of "Electronics and ICT Academy, MNIT Jaipur" Payable at Jaipur or <i>Online Mode:</i> Account Name: Electronics & ICT Academy, MNIT, Jaipur Account No: 676801700483, IFSC: ICIC0006768
NIT Patna	Bihar, Jharkhand, Odisha, and West Bengal	Demand draft in favor of "Director, NIT Patna" payable at Patna or <i>On-line Mode:</i> Account Name: NIT, Patna Account No: 50380476798, IFSC: ALLA0212286
IIT Roorkee	Jammu and Kashmir, Himachal Pradesh, and Uttarakhand	Demand draft in favor of "Dean SRIC IIT Roorkee" payable at Roorkee or On-line Mode: Account Name: Research Project, IIT Roorkee Account No: 33012172097, IFSC: SBIN0001069

Note: Participants belonging to a state other than the states mentioned above can apply to any one of the nearest academies as per their choice.

How to apply:

- * A duly filled-in application form in the prescribed format duly signed and sponsored by the Head of the Institute to which candidate belongs (along with demand draft / wire transfer details) should reach by post to the local coordinator of the participating academy.
- * Government of India norms will be followed for SC/ST category participants.
- * The application form along with the Registration fee can also be submitted by e-mail to Local Coordinator of the respective academy.

Note: Refer offering Academies websites for complete postal address and other details of winter courses.

Last Date for Submission of Applications and Intimation of Selection:

S.No.	FDP Name	Dates of the FDP	Last date for submission of application	Selection list intimation by e-mail/ Display in the website
1.	Object Oriented Programming	20-29, November 2017	10th November 2017	15th November 2017
2.	Digital Signal Processing and Sensons	1-10, December 2017	20th November 2017	25th November 2017
3.	Power Electronics	11-20, December 2017	1st December 2017	05th December 2017

The following are the details of winter courses being offered during November - December 2017

Winter Course 1: OBJECT ORIENTED PROGRAMMING (20-29, November 2017)

Module No.	Module Name	Module Coordinator	Topics	Speaker(s)
1.	00P	Dr. Arka Prokash Mazumdar MNIT Jaipur e-mail: apmazumdar.cse@mnit.ac.in Mobile: 954 965 8129	Introduction to OOP, Why OOP, OOP vs. other Paradigms; Basic Concepts - Classes, Objects; OOP properties - Encapsulation, Abstraction, Inheritance, Polymorphism.	Dr. Arka Prokash Mazumdar MINT, Jaipur + team from MNIT, Jaipur
2.	Java		Introduction to Java - Why Java, Where is Java, Java compilation vs Other languages, JVM, JRE, JDK; Programming - Code structure, Classes, Objects, Methods, Data types, Reference variables, Scope and life time of variables, A simple java program; Arrays, operators, expressions, Conditional Branching, Iterations. Constructors, Method Overloading, Class hierarchies (Inheritance), Base & Derived Classes, Type of Inheritance, Multiple and multi-level Inheritance, Overloading and Overriding, Dynamic Method Dispatch, Type conversion and type casting, Method binding, Coping with complexity, Universal super class. Constructors, Access and non-access Modifiers, Object class, Abstract Classes, Interfaces, Inner Class, Anonymous classes, Packages, Naming, Domain, Foundation packages, Package creation Garbage Collection, Factory Methods; Exception handling- Error classes, Exception types, Throwing and handling exceptions, Creating new exceptions; Java Threads- life cycle, priorities, Runnable and Thread classes, Scheduling, Synchronization. File Handling - Streams, Files, and Buffers. Introduction to C++. Simple C++ program, Methods, Classes, Comparison with Java classes, Member Functions, Access modifiers of Members, Constructor and Destructors, Copy constructors. Inheritance - different implementations, Comparison with Java's limited Inheritance.	Dr. Arka Prokash Mazumdar MINT, Jaipur + team from MNIT, Jaipur
			Friend functions, Why Java does not Support it. Operator Overloading, Virtual Functions, Abstract classes. C++ templates.	

Module No.	Module Name	Module Coordinator	Topics	Speaker(s)
3.	Python Program- ming	Prof. J. P. Singh NIT Patna email: jps@nitp.ac.in	Python: Introduction, Variable Type, Operators, Working with Lists and Importing Libraries. The Random library.	Prof. J. P. Singh NIT Patna
		Mobile: 852 115 9014	Formatting, Statistics, and a Menu Driven Database Program, Tuples, Data Dictionaries, Text and CSV Files, Functional Values, Sorting,	Dr. Akshay Deepak NIT Patna
			Applied Plotting, Charting & Data Representation in Python,	Dr. Akshay Deepak NIT Patna
			Applied Machine Learning in Python- Intro to SciKit, text mining and text manipulation basics, (nltk framework for manipulating text), (basic natural language processing methods to text)	Prof. J. P. Singh NIT Patna
4.	Scala Program- ming	Dr. Pilli Emmanuel Shubhakar MNIT Jaipur e-mail:espilli.cse@mnit.ac.in	Scala: Basic, Object Oriented Programming- classes, case objects, (Collections, Idiomatic Scala)	Industry Talk(s)
		Mobile: 954 965 8131	Case studies/Demo- Scala applications	
5.	R Program- ming	rogram- Somayajulu	R Basics: Introduction, Syntax, Variable Type, Basic Operators, flow control, functions, data structures. Exploratory data analysis.	Prof. D. V. L. N. Somayajulu NIT Warangal
			Pre-model-building activities - univariate and bivariate analysis, outlier detection, and missing value treatment.	
			Linear and non-linear regression modeling and classification models, math behind the working of classification algorithms; unsupervised learning algorithms, time series analysis and forecasting models, and text analytics.	Prof. V. Ravindranath JNTU Kakinada
			Term Document Matrix, normalize with TF- IDF, word cloud; cosine similarity, score similar documents, Latent Semantic Indexing (LSI) as a vector space model to group similar documents.	Dr. Nagesh Bhatt IDBRT, Hyderabad
			Programming Plot function, Programming Subplots, saving plot, programming color and 3D Plots. Constructing charts using the Ggplot2, multiple strategies to speed up R code; `dplyr` and `data.table` packages, pipe operator; interface C++ code in R using Rcpp package; building an R package using facilities from the roxygen2 and dev tools packages.	Dr. T. Ramakrishnudu NIT Warangal

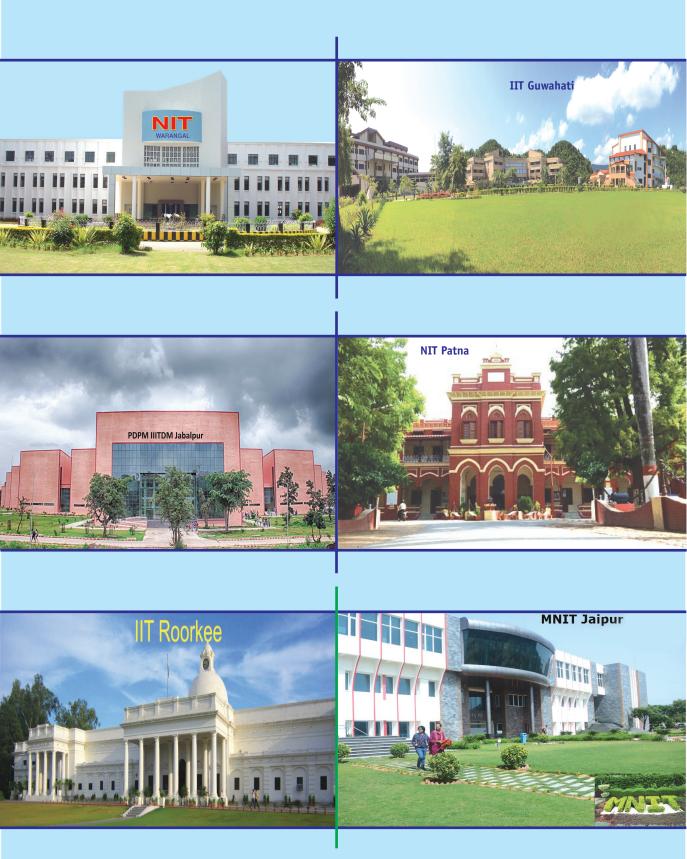
Winter Course 2: DIGITAL SIGNAL PROCESSING AND SENSORS (1-10, December 2017)

Module No.	Module Name	Module Coordinator	Topics	Speaker(s)
1.	Introduc- tion to Signals and Systems	Dr. L. Bhargava MNIT Jaipur e-mail: lavab@mnit.ac.in Mobile: 954 9654 231	Review of Signals and Systems, linear shift invariant systems, stability, and causality. Linear constant coefficient difference equations: Impulse response, step response, response to arbitrary inputs. (2 hours)	Prof. S. C. Dutta Roy and Prof. S. D. Joshi MNIT Jaipur
			Frequency domain representation of discrete time signals and systems: Z-Transform and properties, analysis of linear time invariant systems using Z-domain. Frequency Analysis of Discrete Time Signals: Discrete Fourier representation of periodic sequences (DTFT), Properties, Frequency response. (4 hours)	Prof. S. D. Joshi MNIT Jaipur
			Discrete Fourier Transform: The DFT & its properties; Inverse DFT, Linear filtering methods based on DFT - Use of DFT in linear filtering, filtering of long data sequences, Efficient computation of DFT algorithms - Radix 2 (DIT & DIF), Radix 4, Split radix algorithms.	Dr. Puli Kishore Kumar NIT Patna
			Linear filtering approach to computation of DFT - Goertzel algorithm, Chirp z transform, Quantization effects in the computation of DFT - Direct & FFT method. (2 hours)	Prof. S.D. Joshi MNIT Jaipur
2.	Filter Design and Realiza- tion	Prof. Rohit Sinha IIT Guwahati e-mail: rsinha@iitg.ernet.in Mobile: 995 482 5080	Digital Filter Structures: FIR filters - Direct form, Cascade form, Frequency sampling, Lattice; IIR filters - Direct form-I/II, Cascade form, Parallel form, Lattice & Camp; Lattice- Ladder.	Prof. Rohit Sinha and Dr. Shaik Rafi Ahamed IIT Guwahati
			Design of FIR Filters: Linear phase FIR filter, Design of linear phase FIR filter - Windowing, Frequency sampling; Optimum equiripple linear phase FIR filter.	
			Design of IIR Filters: IIR filters from Analog filters (Butterworth approximation) - Impulse invariance, Bilinear transformation; Frequency Transformations.	
			Quantization & amp; Round-Off Effects: Sensitivity to quantization of filter coefficients, Round-off effects in digital filters - Limit cycle, scaling to prevent Overflow.	

Module No.	Module Name	Module Coordinator	Topics	Speaker(s)
3.	Multirate DSP and DSP Proces- sors	Dr. T. Kishore Kumar NIT, Warangal e-mail: kishorefr@gmail.com Mobile: 833 296 9353	Multirate DSP: Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D.	Sri M. V. Raghunath and Sri K. V. Sridhar NIT, Warangal
			DSP Processors: TMS 320X/ ADSP 21XX Architecture and Applications.	Industry Talk (DRDO/Unistring, Hyderabad)
4.	Intro- duction and Mesure- ment of Physical Para- meters (Part 1)	Dr. T. Kishore Kumar NIT, Warangal e-mail: kishorefr@gmail.com Mobile: 833 296 9353	Introduction to Sensors, Basic Requirements, Classification, static and dynamic characteristics, Loading effects, Introduction to strain, Load, Force and Displacement sensors. Displacement : Linear and Rotary displace- ment sensors-Potentiometer, Capacitive and Inductive type displacement sensor - position sensors - Optical encoder, Photoelectric sensor, Hall Effect Sensor. Proximity: Eddy current proximity sensor- Inductive Proximity sensor- Capacitive Proximity sensor -Pneumatic Proximity sensors- Proximity Switches. Force and Pressure: Contact and Noncontact type - Strain Gauge - Diaphragm Pressure Sensor- Capsule Pressure sensors- Bellows Pressure Sensor- Bourdon tube pressure sensor- Piezoelectric Sensor- Tactile sensor.	Prof. K. S. R. Krishna Prasad, Dr. C. B. Rama Rao, Dr. T. Kishore Kumar and Dr. J. Ravi Kumar NIT, Warangal
5.	Intro- duction and Mesure- ment of Physical Para- meters (Part 2)	Dr. C. Periasamy MNIT Jaipur e-mail: cpsamy.ece@mnit.ac.in Mobile: 954 9654 235	Velocity, Flow And Level: Tachogenerator - Pyroelectric sensors - Ultrasonic sensor - Resistive sensor- Pitot tube - Orificeplate - flow nozzle- Venturi tubes - Rotameter- Electromagnetic flow meter. Float level sensor- Pressure level sensor- Variable capacitance sensor. Temperature : Thermocouples- Thermistors - BimetallicStrip- Resistance Temperature Detector. Motion and Light: Vibrometer and accelerometer- seismic accelerometer. Photoresistors - Photodiodes - Photo- tranistors - Photocondutors.	Prof. P. Chakrabarti IIT, BHU Dr. C. Periasamy MNIT Jaipur

Winter Course 3: POWER ELECTRONICS (11-20, December 2017)

Module No.	Module Name	Module Coordinator	Topics	Speaker(s)
1.	AC-DC Convert- ers	Dr. Praveen Kumar IIT Guwahati e-mail: praveen_kumar@iitg.ernet.in Mobile: 3612582525	Fundamentals of power electronics, semiconductor devices used in power electronics, uncontrolled and controlled single phase rectifiers, three phase rectifiers, filters used in rectifiers.	Dr. Praveen Kumar IIT Guwahati
2.	DC-DC Convert- ers	Dr. Arun Verma MNIT Jaipur e-mail: arun.ee@mnit.ac.in Mobile: 954 965 0188	Buck, boost, buck-boost converters, CUK, SEPIC converters, cascade converters, filters used in DC-DC converters.	Prof. Bhim Singh IIT Delhi Prof. Sandeep Anand IIT Kanpur Prof. Arun Kumar Verma and Dr. Nitin Gupta MNIT, Jaipur
3.	Inverters and AC - AC	Dr. Sachin Jain, NITW e-mail: jsachin@nitw.ac.in Mobile: 944 170 0975	Single phase Half bridge and full bridge inverters - operation with different types of loads (R, R-L, R-L-E)	Dr. Ch. Ramulu NIT Warangal
	Conver- ters		Three phase inverters - operation with different types of loads (R, R-L), modulation techniques used in the inverters	Dr. Sachin Jain NIT Warangal
4.	Applica- tions of Power Electron- ics Conver-	tions of Power Electron- ics MNIT Jaipur e-mail: arun.ee@mnit.ac.in Mobile: 954 965 0188	Applications of power electronics converters in motor drives: Energy conversion and power quality improvement in induction, synchronous, permanent magnet sine fed, synchronous reluctance motors, Permanent magnet brushless dc (PMLDC) and switched reluctance motors.	Prof. Fernandes IIT Bombay
	ters		Use of converters in solar PV systems: Use of non-isolated and isolated DC/DC Converters in Standalone solar PV and Grid interfaced PV, Multi port DC/DC Converter in SPV, DC/DC Converters in solar water pumping. <i>Vehicle to Grid systems.</i>	Prof. Udaykumar R. Y, MNIT Jaipur Prof. Arun Kumar Verma MNIT, Jaipur
			Converters for wind energy conversion systems , Power Converter topology for wind energy conversion system, Back to back converters, matrix converter, Z source converters, Cyclo converters, multilevel converters. Converters for standalone and grid interfaced wind energy conversion system. Unique Configurations for Linking Wind Turbines on the Grid.	Prof. Chatterjee IIT Bombay Dr. Nitin Gupta MNIT, Jaipur
			FACTS devices: An introduction to TCR (thyristor controlled reactor), TSC (thyristor switched capacitors), STATCOM (Static synchronous compensator), SSSC (Static series synchronous compensator), UPFC (Unified power flow controller), Application of these devices in grid tied systems. <i>Smart Inverters</i>	Prof. Chatterjee IIT Bombay Dr. Rajesh Kumar and Dr. Vijaykumar K. MNIT, Jaipur







Contact us

Academy Name	States to Which Catering	Chair/Chief Investigator	Contact Details
Electronics & ICT Academy at NIT Warangal	Telangana, Andhra Pradesh, Karnataka, Puducherry, Andaman and Nicobar Islands, Goa	Chair: Prof. D.V.L.N. Somayajulu Chief Investigator: Prof. N.V.S.N. Sarma	Email: eict.nitw@gmail.com M: 0912 101 6547 Email: sarma@nitw.ac.in M: 091870 2462412 Website: http://nitw.ac.in/eict/
Electronics & ICT Academy at IIT Guwahati	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura,Sikkim	Prof. Ratnajit Bhattacharjee	Email:ratnajit@iitg.ernet.in M: 09954498116 Website: https:// www.iitg.ernet.in/eictacad/
Electronics & ICT Academy at IIITDM Jabalpur	Madhya Pradesh, Chhattisgarh, Maharashtra	Prof. Aparajita Ojha	Email: aojha@iiitdmj.ac.in M: +919425800334 Website: http://ict.iiitdmj.ac.in/
Electronics & ICT Academy at NIT Patna	Bihar, Jharkhand, Odisha, West Bengal	Dr. Bharat Gupta	Email: bharat@nitp.ac.in M: 09331406964 Website: www.nitp.ac.in/ict
Electronics & ICT Academy at IIT Roorkee	Jammu and Kashmir, Himachal Pradesh and Uttarakhand	Dr. Sanjeev Manhas	Email: smanhas333@gmail.com samanfec@iitr.ac.in Website: http://eict.iitr.ac.in/
Electronics & ICT Academy at Malaviya National Institute of Technology Jaipur	Rajasthan, Gujarat, Dadra & Nagar Haveli, Daman & Diu	Prof. Vineet Sahula	Email: vsahula.ece@mnit.ac.in M: 954 9654 227 Website: www.mnit.ac.in