सत्यमेव जयते

National Knowledge Network

Ministry of Electronics & Information Technology

Digital India
Power To Empower

Government of India Initiative for Employability Enhancement

Mentoring Academicians & Professionals for Future Generation

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

IIT Guwahati | IIITDM Jabalpur | MNIT Jaipur | IIT Kanpur | NIT Patna | IIT Roorkee | NIT Warangal

Programme brochure for 2021-22

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 setup Electronics and ICT Academies at 07 (seven) premier and leading 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. Subsequent to internal reviews in Ministry, revised cost and targets for the Electronics and ICT Academies in both the Categories for a period of seven years 4 months are as follows.

Category	Total Outlay	Internal Revenue	Grants-in-Aid from	Training Target Total
Category-A & B: 7- Academies	Rs. 87.7 crore	Rs. 10.4 crore	Rs. 77.3 crore	92,800

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 would be provided funding support upto financial year 2021-22, 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 March 2022. All these Academies will cater to the requirements of identified neighboring States and UTs also. Brief information about all the Academies is available at:
https://meity.gov.in/esdm/scheme-financial-assistance-setting-electronics-and-ict-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/ un-employed
- Design, Develop and Deliver specialized modules for specific research areas
- Providing advice and support for technical incubation and entrepreneurial activities

About Summer/Summer Courses

Online Training Programmes in core areas of Electronics and Information & Communication Technology (ICT) streams have been planned by academies for delivery during Summers & Autumn (i.e., Jun – Oct 2021). All these Summers & Autumn courses will be offered through online live web-conferencing, with instructor led talks delivered by eminent experts from IITs, NITs, IIITs and other premier institutes/industries, even from within our country and abroad. Participants would be able to join online to web-conferencing platform using video/audio. For registration participants need to apply to any participating academy online through its website, as mentioned in details of respective programme,

How to apply:

* For a particular programme, a participant is encouraged to apply to respective coordinator at anyone of the seven Academies, participating in that programme.
* Government of India norms will be followed for SC/ST/EWS category participants.
* The application form is to be submitted in the online mode to the coordinator of the respective academy.

Note: Refer, programme offering Academies websites for complete contact address and other details of Summer & Autumn courses.

Following programmes are being offered online, this Summer/Autumn, Jun - Oct 2021, each of 10/12 days duration.

Names of courses in Spring 2021	Starting date	Completion date	Names of courses in Autumn 2021	Starting date	Completion date
Social Robotics & AI	28 Jun	5 Jul 2021	Advanced Communication/Antennae	22 Nov	03 Dec 2021
Digital Tools for Writing, Authoring and reviewing manuscripts	12 Jul	23 Jul 2021	Blockchain Technology & Applications	22 Nov	03 Dec 2021
Programming in Python	26 Jul	6 Aug 2021	Chip Design: from Devices to Circuits	6 Dec	17 Dec 2021
Deep Learning & Applications (Parallel Architectures)	23 Aug	03 Sep 2021	Data Science for All	6 Dec	17 Dec 2021
Advanced Optimization Techniques and Hands-on with MATLAB/SCILAB	06 Sep	17 Sep 2021	RISC-V VLSI Implementation Flow: RTL2GDS	20 Dec	31 Dec2021
SuperX- Operating Systems- Linux	20 Sep	01 Oct 2021	Machine Learning & Computer Vision	20 Dec	31 Dec 2021
MATLAB Programming for Additive Manufacturing and 3D Printing (MPAM)	20 Sep	01 Oct 2021	Designing With FPGAs (Intel)	03 Jan	14 Jan 2022
Quantum Computing	27 Sep	8 Oct 2021	ICT Tools for Teaching, Learning process & Institutes	17 Jan	28 Jan 2022
Numerical & engineering computation, optimization for Physicists, Scientists & Engineers using open-source- SCILAB	04 Oct	15 Oct 2021	Scientific Computation and GUI Development Using MATLAB	31 Jan	01 Feb 2022
OpenPower RISC architecture Design (enabled by IBM)	18 Oct	29 Oct 2021	Electric Vehicles & mobility	14 Feb	25 Feb 2022
			Cognitive architectures, Algorithms & applications- NLP & EDA	28 Feb	11 Mar 2022

Following are the programmes being offered as Self-Paced in this Summer, Jun - Oct 2021, by IIT Kanpur Academy.

Introduction to Compilers	Computer System Security	Smart Grid Technology	https://ict.iitk.ac.in

Target Beneficiaries:

Interested Faculty/students of engineering/other institutions & professionals from our country as well as from outside India, are eligible to attend these Spring/Summer courses. Additionally, faculty of non-engineering background are also invited to attend FDP on ICT Tools and techniques for Teaching Learning Process & Institutes. Industry persons and student participants are also invited to attend the aforesaid programmes to upgrade their skills.

Availability of seats at each offering Academy:

Participants will be selected based on first-cum-first-serve basis by organizing academy. Selected participants will be communicated through e-mail / notified in E&ICT Academy websites. There is no limit on number of participants, however, only first 1000 participants would enjoy duplex both way video/audio. Rest of the participants would enjoy receiving video/audio but may not raise queries in real-time.

Course duration:

Each course is designed as 3 credit equivalent for 35-40 hours (Theory Lectures, Hands-on/Design orientation/Activity linked problems/Assignments Problem Solving/Case Studies sessions/Quiz Tests). The contact hours are to be spread over 10 days, implying NOT more than 3½ hours per day.

Accommodation & Travel

There is no provision as well as scope for Boarding and Lodging, as all the programmes are being offered ONLINE.

Registration Fee for each Summer Course:

No Registration fee is charged for attending these programmes. However, candidates from India/SAARC/African countries are required to pay a mandatory examination fee of Rs. 500/- (faculty/PhD-scholars/students) OR Rs. 1000/- (others), and US$ 60 or £ 50 from other countries, if they desire a certificate of completion of programme. This Certificate for participation as well as for Satisfactory performance will be given to the participants subject to fulfillment of attending all sessions, submission of assignments and clearing the test(s) by all the paying participants.

Mode of Payment: Preferred mode is ONLINE payment at respective Academy site.

Academy Name	Link for payment
IIT Guwahati	Online registration at web site of Academy, IIT Guwahati- http://www.iitg.ernet.in/eictacad/
IIITDM Jabalpur	Online registration at web site of Academy, IIITDM Jabalpur- http://ict.iiitdmj.ac.in/
MNIT Jaipur	Online registration at web site of Academy, MNIT Jaipur- http://www.mnit.ac.in/eict
IIT Kanpur	Online registration at web site of Academy, IIT Kanpur - https://ict.iitk.ac.in/
NIT Patna	Online registration at web site of Academy of NIT Patna- http://www.nitp.ac.in/ict
IIT Roorkee	Online registration at web site of Academy of IIT Roorkee- http://eict.iitr.ac.in/
NIT Warangal	Online registration at web site of Academy NIT Warangal- http://nitw.ac.in/eict/

- Last Date for Submission of Applications is Monday of earlier week from the start date of respective programme.
- The intimation of Selection for participation will be posted on website on Wednesday of previous week.

The details of Online-Summer courses being offered during May - Oct 2021 is as follows.

1. Social Robotics & AI		28 Jun – 5 Jul 2021
EXPERTS/SPEAKERS- (i) Prof. Santanu Chaudhury, IIT Jodhpur, Prof. Domenico P., University of Siena, Italy, Prof. K. Kurien Issac, IIST Thiruvananthapuram; Prof. V.M. Gadre, IIT Bombay; Prof. A. Ojha, IIITDM Jabalpur; Prof V K Gupta, IIITDM Jabalpur		
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MODULES TOPICS-		
• Introduction to Introduction to Robotics • Robot Kinematics • Wheeled Mobile Robots	• Artificial Intelligence and Machine Learning • Deep Learning for Computer Vision • Path and Trajectory Planning	• Reinforcement Learning • Robots in healthcare • Robot Control and Design • Rehabilitation Robotics

2. Digital Tools for Writing, Authoring and reviewing manuscripts 12 – 23 July 2021

EXPERTS/SPEAKERS- (i) Dr. C. P. Ravikumar, Texas Instruments (ii) Prof. Binod Mishra, IIT Roorkee, (iii) Prof. Prathap Haridoss, IITM (iv) Prof. D. B. Phatak, IITB (v) Mr. C. V. Radhakrishnan, TUG & River-Valley (vi) Prof. Yogananda C. S., Chairman TUG-group (vii) Dr. Reema Sahni, IITD & team, (viii) Dr. David Raggio (QS ranking) (consent awaited) (ix) Active Learning group, IITB & speakers from host institutes Dr. Gaurav Trivedi, Dr. M. Ravi Kumar, MNITJ, Dr. Arka P. Mazumdar, MNITJ, Dr. Amit M. Joshi, MNITJ Dr. E. S. Pilli MNITJ

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MODULES TOPICS-

- Technical Writing and Research Methodology:
- Language support tools- Grammarly, Draft
- Introduction to Typesetting in Latex; Writing a technical report in Latex- outline & Contents
- Mathematical style- Mathematics in Science and Technology
- Writing manuscript in Latex- working with figures, tables
- Technical Reports, Manuscripts, Thesis
- Making presentation in Latex, Beamer
- Reviewing manuscripts; Responding to reviewer's comment
- Mastering Language – Spoken & written; communication skills
- Bibliography management, Mendeley, JabRef
- Publishing in print and for the Internet
- Online tools- CV, Sharelatex, OverLeaf, Author Kits
- Agile Classroom: Teaching, Learning
- Reviewing manuscripts, reports, projects

3. Programming in Python — 26 Jul - 6 Aug 2021

EXPERTS/SPEAKERS- Prof. Aparajita Ojha, IIITDMJ, Dr. Amey Karkare IIT Kanpur, Dr. Atul Gupta, IIITDMJ, Dr. Emmanuel S. Pilli, MNITJ, Dr. Arka P. Mazumdar, MNITJ,

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MODULES TOPICS-

- **Introduction & basics of Python Programming:** History of Python, Installing Python, Executing Python Programs, Internal Working of Python, Python Implementations. Python Character Set, Token, Python Core Data Type, print() function, Assigning Value to Variable, input() function, eval() function, Formatting Number and Strings, Operators and Expressions, Differential Evolution, Social Spider Optimization)
- **Decision Statements; Loop Control Statements; Functions, Strings** Boolean Type, Boolean Operators, Using Number and Strings with Boolean Operators, Decision Making Statements and Conditional Expressions While loop, range( ) Function, For Loop, Nested Loops, Break Statement, Continue Statement; Syntax and Basics of a Function, Use of a function, Parameters and Arguments, Local and Global Scope Scope of a Variable, return statement and Recursive Functions.; str class, Inbuilt functions for String, index[] operator, traversal of String, String operators, String Operations,
- **Lists and Dictionaries; Tuples and Sets; File Handling; Pandas** Creating Lists, Basic list operators, Slicing, Inbuilt functions for Lists, List operator, List Methods, Splitting, Need of Dictionary, Creating a Dictionary , Adding and Replacing Values, Retrieving Values ; Deleting Items and Traversing Dictionaries. Tuples and Sets: Creating Tuples; Tuple () Function, Inbuilt Functions for Tuples, Indexing and Slicing; Operations on Tuples; Traverse Tuples from a List, Set operators; Set class. Object-Oriented Programming: Classes and objects, methods, Operator Overloading, Inheritance, super () and Method Overriding. File Handling: Need of File Handling, Reading/Writing Text and Numbers to/from a File; Directories on a disk. Pandas: Using Pandas, the python data analysis library and data frames
- **Data Handling and Use Cases-** RE Pattern Matching, Parsing Data, Introduction to Regression , Types of Regression , Use Cases , Exploratory data analysis , Correlation Matrix , Visualization using Matplotlib and Implementing linear regression.
- **Machine Learning-** Machine Learning - Algorithm, Algorithms - Random forest , Super vector Machine , Random Forest , Build your own model in python and Comparison between random forest and decision tree.

4. Quantum Computing — 9 - 20 Aug 2021

EXPERTS/SPEAKERS- Industry- Microsoft Inc. – experts from Microsoft Garage- Azure Quantum

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MODULES TOPICS-

- Quantum Measurements Density Matrices; Positive-Operator Valued Measure; Fragility of quantum information: Decoherence
- Quantum Superposition and Entanglement; Quantum Gates and Circuits; No cloning theorem & Quantum Teleportation; Bell's inequality and its implications
- Quantum Algorithms & Circuits; Deutsch and Deutsch–Jozsa algorithms; Grover's Search Algorithm; Quantum Fourier Transform
- Shore's Factorization Algorithm; Quantum Error Correction: Fault tolerance; Quantum Cryptography; Implementing Quantum Computing: issues of fidelity
- Scalability in quantum computing; NMR Quantum Computing; Spintronics and QED approaches
- Linear Optical Approaches; Nonlinear Optical Approaches; Limits of the approaches; Future scope

5. Deep Learning & Applications (Parallel Architectures) 23 Aug – 3 Sep 2021

EXPERTS/SPEAKERS- (i) Industry support from NVidia, MathWorks (MATLAB) (ii) Dr. Anupama Ray, IBM (iii) Dr. Ritu, Intel, (iv) Prof. R. Venkatesh Babu, IISc Banglore (v) Dr. Biplab Banerjee IITB
Experts from host institutes- (iii) Prof. R. Balasubramanian, IITR (iv) Prof. Aparajita Ojha, IIITDMJ (v) Dr. Partha Pratim Roy, IITR (vi) Dr. Santosh K. Vipparthi, MNITJ

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MODULES TOPICS-

- **Artificial Neural Networks (ANNs)-** Introduction to Deep Learning and Motivation. Brief introduction of Artificial Neural Networks (ANN), Perceptrons, Multilayer perceptron (MLP), Back propagation training for MLP, Stochastic gradient descent. Applications to some practical classification problems.

  Hands on: Demonstration and implementation of Shallow and Deep architecture, introduction to Python, Tensorflow and Keras.

- **Regularization, Hyperparameter Tuning and Autoencoders -** Deep Feed forward Networks - Regularization - drop out, Minibatch gradient descent, RMSProp and Adam optimization, Autoencoders and Their Types

  Hands on: Hyper parameter tuning and regularization practice, Minibatch gradient descent, Autoencoders

- **Convolutional Networks -** The Convolution Operation, Pooling, Basic architecture of a Convolution Neural Network, Variants of the Basic Convolution Model, Evolution of Convolution NN Architectures - AlexNet, ResNet and other architectures.

  Hands on : Convolution neural network application using Tensorflow and Keras, Autoencoders using CNN, Building an application for classification and feature extraction.

- **Sequence Modeling-** Recurrent and Recursive Nets - Unfolding Computational Graphs, Recurrent Neural Networks, The Long Short-Term Memory and Other Gated RNNs.

  Hands on : Language modeling and machine translation, Chatbots.

- **Generative Adversarial Networks, Object Detection Algorithms-** GAN and their variants- R-CNN , YOLO and SSD

  Hands on– Object detection, Realistic Image Generation and face recognition

6. Advanced Optimization Techniques and Hands-on with MATLAB/SCILAB

6 – 17 Sep 2021

EXPERTS/SPEAKERS- 1) Prof. Ganapati Panda, Fellow INAE, Fellow NASI, Former Dy. Director and Prof. Emeritus, IIT Bhubaneswar, 2) Dr. Nithin V. George, Associate Professor, Dept. of Electrical Engineering, IIT Gandhinagar, 3) Dr. Pyari M. Pradhan, Assistant Professor, Dept. of Electronics and Communication Engg., IIT Roorkee 4) Dr. Sitanshu Sekhar Sahu, Assistant Professor, Dept. of Electronics and Communication Engg., Birla Institute of Technology Mesra 5) Dr. Jagdish Chand Bansal, Associate Professor, Dept. of Mathematics, South Asian University, New Delhi 6) Dr. Sripama Saha, Associate Professor, Dept. of Computer Science and Engineering, IIT Patna 7) Dr Prashant K. Jain, IIITDMJ 8) Prof. Rajesh Kumar, MNIT Jaipur 9) Dr. Satyasai Jagannath Nanda, MNIT Jaipur

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MODULES TOPICS- To be Announced (IIT Guwahati)

- **Fundamental of Optimization -** Unconstrained and Constrained Optimization, Linear Programming, Graphical Method, Symmetric Dual Problems, Simplex Method, Derivative based Optimization, Newton's Method, Least Mean Square Method.
- **Nature Inspired Optimization -** Multi-modal function Optimization, Evolutionary Computation (Genetic algorithm, Genetic Programming, Differential Evolution, Social Spider Optimization) Swarm Intelligence (Particle Swarm Optimization, Ant Colony Optimization, Cat Swarm Optimization, Cuckoo-search, Grey Wolf Optimization, Whale Optimization), Bio-Inspired Optimization (Artificial Immune System, Bacterial Foraging Optimization), Physical Algorithms (Simulated Annealing, Colliding Bodies Optimization, Gravitational Search Optimization).
- **Multi-objective Optimization**, Non-dominated Solutions, Non-dominated Sorted Genetic Algorithm (NSGA-II), Multi objective Particle Swarm Optimization, Many-objective Optimization, NSGA-III.
- **Applications-** Benchmark mathematical function optimization, Linear and Nonlinear System Identification, Dynamic System Identification, Communication Channel Equalization, Device Modeling, Forecasting/Prediction of time series, Data Classification and Clustering, Hybridization of optimization techniques with Neural Networks and Deep Neural Networks, genomic signal processing.

7. SuperX- Operating Systems- Linux 20 Sep – 1 Oct 2021

EXPERTS/SPEAKERS- Speakers from Industry, IIT Guwahati, MNIT Jaipur and NIT Patna

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MODULES TOPICS-

- SuperX is a Linux-based computer operating system originally developed in India. SuperX uses a tweaked version of KDE and is aimed towards beginners and casual users. It is India's indigenous OS developed in Assam with support from government agency.
- SuperX stands for "Simple, User friendly, Powerful, Energetic and Robust eXperience"
- KDE as its Graphical User Interface; Linux kernel with Hardware Enablement (HWE) following Ubuntu LTS specifications
- Latest release is SuperX 5.0 "Lamarr"
- SuperX Appstore as well as any other APT-based package management tools
- Experts will cover essential topics like system administration, network administration & kernel compilation

8. MATLAB Programming for Additive Manufacturing and 3D Printing (MPAM)

20 Sep – 1 Oct 2021

EXPERTS/SPEAKERS- from IITs/NITs/IIITs and industry- CONSENT Awaited

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Dr Prashant K. Jain IIITDM Jabalpur pkjain@iiitdmj.ac.in M: 9425800310	Prof. G. S. Dangayach MNIT Jaipur gsdangayach.mech@mnit.ac.in M: 954 9654 493	Prof. Ratnajit Bhattacharjee, IIT Guwahati ratnajit@iitg.ac.in M: 9954498116
Joint- Principal Coordinators		
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MODULES TOPICS-

• MATLAB User Interface, Basic Operations, Data Format, Handling Variables, Expressions and Matrices, Programming Basics for decision making, Conditional/logical Statement, Execution Control, Loops, 2D Plotting Visualization Using MATLAB, 3D Plots, Modifying plots using property editor, Automating Plots using Functions, Handling data in MS Excel and text file, • Debugging a program, Algorithm development and Problem formulation,	• Building Graphical User Interface (GUI), Building GUIs with display of information, Developing GUI for Input/output functions, App development in MATLAB, Generating Executable Files and Stand-Alone Applications, Case Studies • Overview and basics of Rapid Prototyping/Additive Manufacturing/3D printing, Need, Basic Principles and Steps in RP/AM/3DP, Process chain, Classification of Additive manufacturing processes,	• FDM and SLS Process, Applications and case studies, Data preparation, STL File Problems, STL File Manipulation and Repair Algorithms, STL file reading, repairing, slicing, contour generation, path planning, G&M code generation, open source software for 3D printing, Machine Demonstration, Part printing, Recent research trends in RP/AM/3DP, interdisciplinary aspects in RP/AM/3DP, Bio Medical applications.

9. Numerical & engineering computation, optimization for Physicists, Scientists & Engineers- open source SCILAB

4 – 15 Oct 2021

EXPERTS/SPEAKERS- From IITs/NITs/IIITs and industry, research organizations- (i) Prof. Kannan Moudgalya, IITB (consent awaited), (ii) Chaitanya Kancharla, ESI-SCILAB; (iii) Experts from INRIA/SCILAB (CONSENT Awaited)

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MODULES TOPICS-

• (i) **Solving set of equations-** Perform computations like matrix, vectors; Gaussian elimination & iterative methods, ill-conditioned systems, iterative methods; non linear equations	• Solving ordinary differential equations (ODE); plotting 2D and 3D plots; diagram creation	• **Linear algebraic equations, fast computation,** Pade & rational approximation
• (ii) **Large Matrix analysis and large Eigen value problem-** Eigenvalues & eigen vectors- Gerschghorin theorem, iterative method, Sturm sequence, QR method, Singular value problems	• **Xcos-** Model based simulations using Xcos;	• **Numerical approximations** of functions - Taylor's polynomial, least square approximation, Chebyshev series/polynomial, splines,
• **Random numbers** Simulation & Applications	• Introduction to Discrete Probabilities withScilab	• Fourier coefficients, Fourier series, trigonometric interpolation, DFT, FFT; Compression
• **Open source & traditional technical computing**	• Introduction to constrained and un-constrained optimization; optimality conditions;	• Application development; Industry real time Use Cases
	• Writing functions in Scilab and scripting	
	• Building an interactive GUI	

10. OpenPower RISC architecture Design (enabled by Industry IBM)

18 – 29 Oct 2021

EXPERTS/SPEAKERS- Experts from IBM

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MODULES TOPICS-

- Processor data path design
- Control design- Hardwired control
- Arithmetic circuit design
- Data path & control pipelining
- RISC superscalar architectures
- Parallelism and systolic arrays
- Simulations and Characterization for Libraries
- Design Basics: Circuit, Architecture and System Level
- Constraints and Synthesis : Input Output Constraints, Complex SoC Constraints; Input Output Files : Lib Files, General files needed in complete flow
- Layer and Power Planning
- Floorplanning
- Delay Calculations and System Implications
- Setup and Hold Discussion
  Placement Basics and Settings
- DRC LVS and Extraction
- Low Power Flow Basics
- Sign Off

Various courses from IIT Kanpur in Intelligent Self Paced Education (iSPED) mode are being offered in this pandemic period till September 2021. The courses are made available to faculty for free for a limited duration under FDP. Participants may please ignore the price mentioned on the URL for the courses, and join the courses of their choice.

11. Computer System Security (https://ict.iitk.ac.in/product/computer-system-security/)

EXPERTS/SPEAKERS-

Prof. Sandeep Shukla (https://www.cse.iitk.ac.in/users/sandeeps/)

Principal Coordinator

Prof. Amey Karkare, IIT Kanpur,
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MODULES TOPICS-

• Introduction, Interview with Prof.Sandeep Shukla; Learning objectives, Sample Attacks, The Marketplace for vulnerabilities, Error 404 Hacking digital India part 1 chase	• VM based isolation, Confinement principle, Software fault isolation, Rootkits, Intrusion Detection Systems	• Major web server threats, Cross site request forgery & scripting, Finding vulnerabilities, Secure development
• Control Hijacking, More Control Hijacking attacks integer overflow, More Control Hijacking attacks format string vulnerabilities, Defense against Control Hijacking	• Secure architecture principles isolation and leas, Access Control Concepts	• Basic cryptography, Public key cryptography, RSA public key crypto, Digital signature Hash functions; Email security certificates, Transport Layer security TLS, IP security, DNS security
• Confidentiality Policies, Confinement Principle, Detour Unix user IDs process IDs and privileges	• Web security landscape, Web security definitions goals and threat models, HTTP content rendering, Browser isolation, Security interface, Cookies frames and frame busting	• Internet infrastructure, Summary of weaknesses of internet security, Link layer connectivity and TCP IP connectivity

12. Introduction to Compilers (https://ict.iitk.ac.in/product/introduction-to-compilers/)

EXPERTS/SPEAKERS-

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Principal Coordinator

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IIT Kanpur,
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MODULES TOPICS-

• Introduction	• Overview of Compiler Phases	• Lexical Analysis
• Syntax Analysis	• Top-Down Parsing	• Bottom-up Parsing
• LR Parsers	• Semantic Analysis	• Attributes
• Type Systems	• Symbol Table	• Intermediate Representation
• Runtime Systems	• Code Generation	•

13. Smart Grid Technology (https://ict.iitk.ac.in/product/smart-grid-technology/)

EXPERTS/SPEAKERS-

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Principal Coordinator

Prof. Amey Karkare, IIT Kanpur,
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MODULES TOPICS-

Smart Grid Overview

- History of Smart Grid
- Conventional Grid Vs. Smart Grid
- Features of Smart Grid
- Key Characteristics of Smart Grid
- Smart Grid Elements
- Forces behind Smart Grid Evolution
- Smart Grid Stake Holders
- Smart Grid Building Blocks
- Smart Grid Resources

Smart Grid Architecture & Design

- Conventional Power System Architecture
- IT Layer
- Communication Layer
- Distributed Architecture Design

Smart Grid Measurement

- Synchrophasor Technology
- Smart Meters and Advanced Metering Infrastructure
- Wireless Sensor Network (WSN)
- GIS/Google mapping
-

Smart Grid Communication

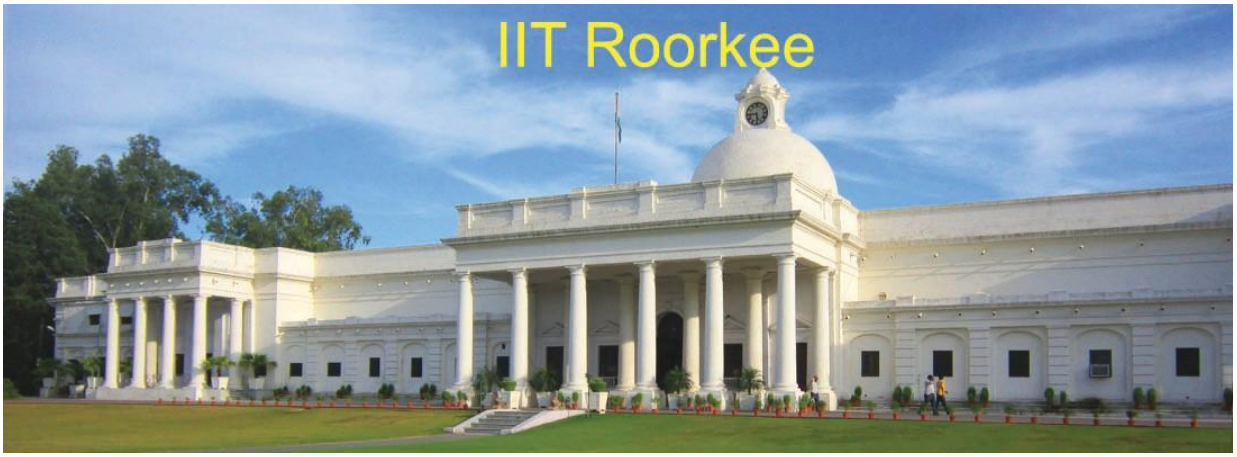
- Wired Communication (e.g. PLCC, Ethernet, Optical Fibre)
- Wireless Communication (e.g. WiFi, Zigbee, GSM/GPRS, WAN)
- Machine to Machine Communication

Smart Grid Standards and Protocols

- IEC 61850
- IEC 60870
- IEEE C37.118
- IEEE 1588
- IEC 62351; IEC 61970/ 61968
- IEC 62056; DNP 3.0

Interoperability & Associated Standard

- Interoperability issues in Smart Grid and its solutions
- Common Information Model
- Multispeak
- Green Button
- SunSpec
- SEP 2.0


IIT Roorkee

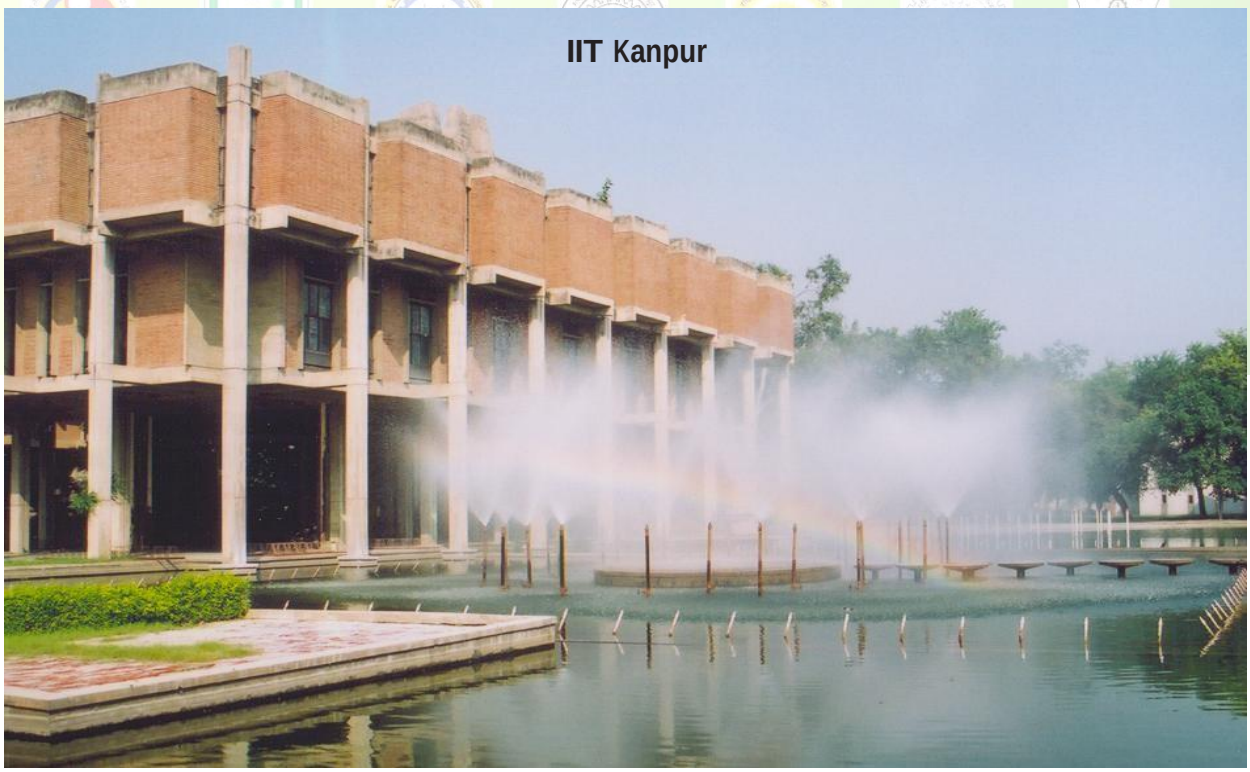

IIT Guwahati

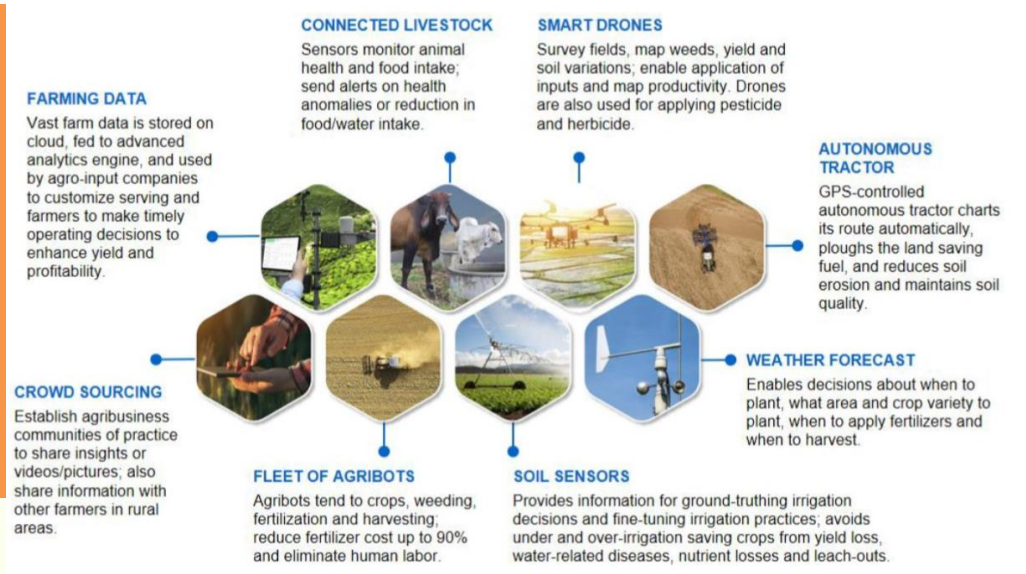

NIT
WARANGAL


MNIT Jaipur
MNIT


NIT Patna

IIT Guwahati IIITDM Jabalpur MNIT Jaipur IIT Kanpur NIT Patna IIT Roorkee NIT Warangal





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