



# SWAYAM

## January 2026

COURSES OFFERED UNDER  
DIPLOMA PROGRAMME

**NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING  
AND RESEARCH**

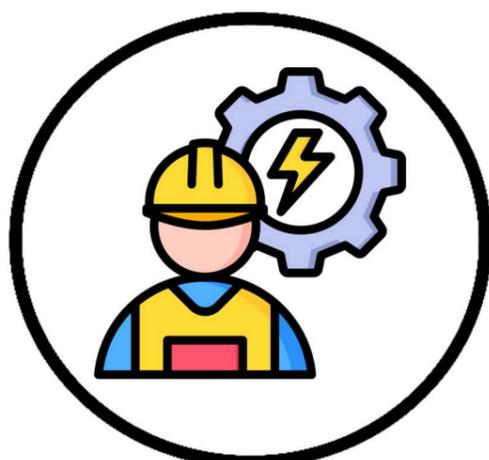
Institution Deemed to be University under Distinct Category,  
A Centrally Funded Technical Institute Ministry of Education,  
Government of India, Taramani, Chennai - 600113



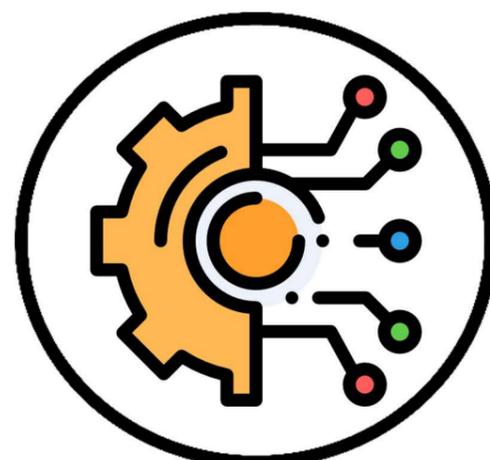
## NITTTR offers the courses in the following clusters



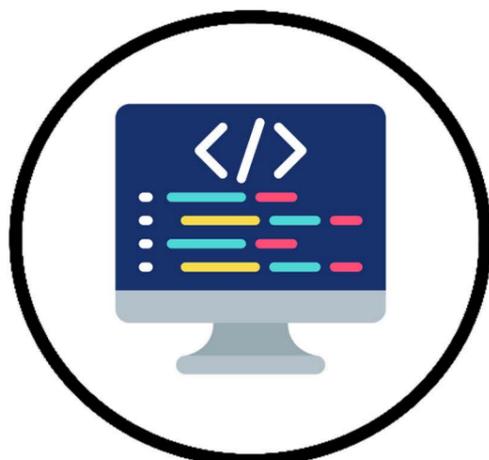
**Civil Engineering**



**Electrical and Electronics Engineering**



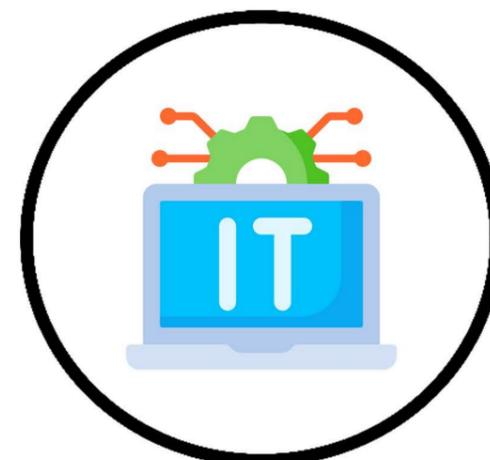
**Electronics and Communication Engineering**



**Computer Science and Engineering**



**Mechanical Engineering**



**Information Technology**



**Open Electives**



**Plastic / Polymer Engineering**

A background image of a construction site at sunset. A large crane is visible on the left, and a multi-story building is under construction in the center. The sky is a mix of orange and blue. A large white circular graphic is overlaid on the right side of the image.

# Civil Engineering




  
**Join the Course**
  
**CONSTRUCTION MATERIALS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Traditional Materials
- Processed and Engineered Materials
- Manufactured Sand (M-Sand)
- Cement, Concrete, and Bituminous Materials
- Modern Construction Materials
- Finishing Materials and Coatings
- Construction Equipment and Site Practices
- Sustainable and Smart Construction Materials



Coordinated By  
**Dr. V. Vandhana Devi**  
Professor, NITTR Chennai



FREE For Learning 3 Credits




  
**Join the Course**
  
**TRAFFIC ENGINEERING**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Overview of traffic engineering fundamentals and key road user characteristics.
- Core traffic studies essential for assessing road and traffic performance.
- Road signs, markings, signals, and traffic islands for effective guidance.
- Intersection design principles and major traffic control devices.
- Traffic management, road safety, sustainability, and intelligent transportation systems.



Coordinated By  
**Dr. A. Vinod Kumar**  
Assistant Professor, NITTR Chennai



FREE For Learning 3 Credits




  
**Join the Course**
  
**PRECAST AND PRESTRESSED CONCRETE**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Basics of precast and prestressed concrete, elements, and materials.
- Precast components, prefabricated systems, and joint design.
- Prestressing steels, methods, pretensioning, and post-tensioning systems.
- Prestress losses, BIS guidelines, and beam analysis with cable profiles.
- Design of prestressed beams and overall course review.



Coordinated By  
**Dr. Perumalla Venkata Mallikarjun Rao**  
Assistant Professor, NIT Puducherry



FREE For Learning 3 Credits



# **Information Technology & Computer Science Engineering**




  
**Join the Course**
  
**ADVANCE COMPUTER NETWORKS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Review of Basic Networking
- Network Layer Protocols
- Transport Layer and Protocols
- Advanced Topics in Switching and Routing
- Wireless and Mobile Networks
- Network Security
- Network Performance and Optimization
- Emerging Network Technologies
- Future Trends and Challenges in Computer Networks
- Research Topics and Applications



Coordinated By  
**Dr. V. Shanmuganeethi**  
NITTTR Chennai



FREE For Learning 3 Credits


  
**Join the Course**
  
**ALGORITHMS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Fundamentals of Algorithms and Analysis
- Sorting Algorithms
- Searching Algorithms
- Graphs
- Graph Algorithms
- Strings



Coordinated By  
**Dr. Narendran Rajagopalan**  
Professor, NIT Puducherry



FREE For Learning 3 Credits


  
**Join the Course**
  
**OPERATING SYSTEMS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Introduction to Operating Systems
- System Programs and Process Management
- Multithreading and Memory Management
- File Systems
- File System Implementation
- I/O Systems
- OS Security
- OS Integration and Future Trends



Coordinated By  
**Dr. S. Sasirekha**  
Associate Professor, NITTTR Chennai



FREE For Learning 3 Credits


  
**Join the Course**
  
**COMPUTER NETWORKS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Introduction to Computer Networks
- Transmission Media and Network Topologies
- Data Link Layer and Switching Techniques
- Network Layer - Design and Protocols
- Routing Algorithms and Protocols
- Transport Layer Protocols
- Application Layer Protocols
- Network Devices and Network Management



Coordinated By  
**Dr. N. Karthik**  
Assistant Professor, NIT Puducherry



FREE For Learning 2 Credits


  
**Join the Course**
  
**COMPUTER PROGRAMMING**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Introduction to Problem Solving
- Variables and Representation
- Arithmetic, Relational, Logical and Bitwise Operators
- Input, Output, Formatting and File I/O
- Conditional Statements, Repeat Statements, Loops and Nested Loops
- Arrays and Memory Organization, Strings, Multidimensional Arrays
- Functions and Parameter Passing
- Recursion and Recursive solutions



Coordinated By  
**Dr. T. Sugirtha**  
Assistant Professor,  
IIIT, Tiruchirappalli



**FREE**  
For Learning **2 Credits**


  
**Join the Course**
  
**COMPUTER SYSTEM ORGANISATION**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Structure of Computers
- Register Transfer and Micro Operations
- Micro Programmed Control
- Computer Arithmetic
- Introduction to Microprocessor Architecture
- Assembly Language Programming
- Memory and Digital Interfacing
- Peripheral interface



Coordinated By  
**Dr. Seshu Babu Pulagara**  
Assistant Professor,  
NITTTR Chennai



**FREE**  
For Learning **3 Credits**


  
**Join the Course**
  
**SOFTWARE TESTING**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Introduction to Software Testing and Quality Basics
- Software Testing Techniques
- Advanced Testing Types and Approaches
- Foundations of Test Cases and Data Preparation
- Test Scenarios and Design Techniques
- Test Execution and Quality Assurance Fundamentals
- Monitoring and Measuring Testing Effectiveness
- Bug Tracking and Tracking Essentials
- Test Data and Reporting Insights
- Introduction to Test Automation
- Quality Assurance and Defect Management



Coordinated By  
**Dr. T. Subha**  
Associate Professor, NITTTR Chennai



**FREE**  
For Learning **4 Credits**


  
**Join the Course**
  
**DATA SCIENCES**
  
**DATA WAREHOUSING AND DATA MINING**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Introduction to Data Mining.
- Data Preprocessing.
- Introduction to Data Warehousing.
- Data Warehouse Modelling.
- OLAP and Data Cube Computation.
- Frequent Pattern Mining.
- Association Rule Mining.
- Classification Basics.
- Advanced Classification.
- Cluster Analysis.
- Outlier Detection.
- Web Mining and Applications.



Coordinated By  
**Dr Praveen R**  
Assistant Professor, NIT Puducherry



**FREE**  
For Learning **4 Credits**





Join the Course

## ELECTRIC CIRCUITS & NETWORK

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Basics of circuit elements, combinations, and fundamental laws.
- Nodal and mesh analysis with key circuit theorems (Superposition, Thevenin, Norton, Maximum Power Transfer).
- First- and second-order transient circuit analysis.
- AC circuit fundamentals, phasors, impedance, resonance, and filters.
- Two-port networks, and frequency-dependent analysis using Fourier and Laplace transforms.



Coordinated By  
**Dr. Amrtha Bhide**  
 Associate Professor,  
 NIT Puduche chrry



FREE For Learning 3 Credits





Join the Course

## FUNDAMENTALS OF AI

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to AI foundations—history, Turing Test, symbolic AI, and intelligent agents.
- Heuristic and randomized search methods including hill climbing, genetic algorithms, and ant colony optimization.
- Optimal path-finding using A\*, IDA\*, branch & bound, and related strategies.
- Problem decomposition through goal trees, AO\*, rule-based systems, and planning approaches.
- Logic, inference, constraint satisfaction, and game-playing strategies like minimax and alpha-beta pruning.



Coordinated By  
**Dr. Selvi Rajendran**  
 Professor, NITTR Chennai



FREE For Learning 4 Credits





Join the Course

## INTRODUCTION TO DBMS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- DBMS concepts and architecture
- Data modeling: ER and EER models
- Relational model, constraints, and ER/EER mapping
- SQL: schema, queries, views, constraints, and programming basics
- Functional dependencies and normalization
- Database design algorithms and advanced dependencies



Coordinated By  
**Dr. B. Surendiran**  
 Professor,  
 NIT Puducherry



Coordinated By  
**Dr. V. Vani**  
 Assistant Professor,  
 NIT Puducherry



FREE For Learning 2 Credits





## Join the Course

### MOBILE COMPUTING

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to Android and Development Tools
- Building User Interfaces in Android
- Activities, Intents, and Navigation
- Data Storage and Persistence
- Working with Multimedia and Sensors
- Background Tasks and Notifications
- Advanced Topics and App Optimization
- App Deployment and Project Showcase



Coordinated By  
**Dr. Selvi Rajendran**  
Professor, NITTR Chennai



FREE For Learning 4 Credits





## Join the Course

### MULTIMEDIA TECHNOLOGIES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to Multimedia
- Multimedia hardware
- Multimedia Software
- Basic Compression Techniques
- Content Development and Distribution
- Basics of Graphic Design and use of Digital Technology
- Multimedia Programming and Applications



Coordinated By  
**Dr. T. Subha**  
Associate Professor, NITTR Chennai



FREE For Learning 4 Credits





## Join the Course

### NETWORK FORENSICS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Networking basics, protocols, and fundamentals of network forensics.
- Forensic tools: Wireshark, TCP Dump, Syslog, NMS, port mirroring, snooping, and scanning.
- Analysis of data link, physical, and network layers using logs, MAC/ARP tables, routers, WiFi, and firewalls.
- Examination of OS, server, user, browser, proxy, antivirus, and email logs.
- Challenges: encryption, spoofing, mobility, storage limits, and privacy laws.



Coordinated By  
**Dr Seshu Babu Pulagara**  
Assistant Professor,  
NITTR Chennai



FREE For Learning 3 Credits






## Join the Course

# SCRIPTING LANGUAGES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to Scripting Language
- Control Structures
- Organizing Codes using Functions
- File I/O Operations, Text Processing
- Framework- Django.



Coordinated By  
**Dr. N. Renugadevi**  
 Assistant Professor, IIIT, Tiruchirappalli



FREE For Learning 2 Credits






## Join the Course

# SCRIPTING LANGUAGES LABORATORY

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Python basics: syntax, variables, data types, strings, and interactive shell.
- Operators, lists, tuples, dictionaries, and coding blocks.
- Control structures: if-else, loops, and iterations with break/continue/pass.
- Functions, modules, packages, file I/O, and text processing.
- Web application development using frameworks like Django, Web2Py, or Rails.



Coordinated By  
**Dr. Narendran Rajagopalan**  
 Professor, NIT Puducherry



FREE For Learning 3 Credits






## Join the Course

# SOFT COMPUTING TECHNIQUES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to Soft Computing
- Fuzzy Logic (FL)
- Artificial Neural Networks (ANNs)
- Genetic Algorithms (GAS)
- Hybrid Systems
- Applications of Soft Computing
- Advanced Soft Computing Techniques
- Hands-on Projects and Practical Applications



Coordinated By  
**Dr. T. Subha**  
 Associate Professor, NITTR Chennai



FREE For Learning 3 Credits







## Join the Course

# SSAD/SOFTWARE ENGINEERING

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online



Coordinated By  
**Dr. V. Vani**  
Assistant Professor,  
NIT Puducherry

### Course Layout

- Overview of software engineering fundamentals and major lifecycle models.
- Requirements engineering, analysis, and translating needs into system specifications.
- Key software design principles, architectural styles, and structural decisions.
- Implementation practices, testing methods, quality assurance, and project management basics.
- Configuration, change, release management, maintenance processes, and essential project metrics.



FREE For Learning 2 Credits







## Join the Course

# DATA STRUCTURES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online



Coordinated By  
**Dr. J. Kokila**  
Assistant Professor,  
IIIT Tiruchirappalli

### Course Layout

- Introduction to Data Structures, types, and core operations like traversal, insertion, and deletion.
- Stacks and Queues: structure, operations (PUSH, POP, ENQUEUE, DEQUEUE), and applications such as expression evaluation and Round Robin.
- Linked Lists: singly, circular, and doubly linked structures with key operations.
- Trees: binary concepts, representations, and traversals.
- Graphs: terminologies, representations, and traversals (BFS, DFS).



FREE For Learning 2 Credits







## Join the Course

# WEB-DESIGNING AND MULTIMEDIA TECHNOLOGY

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online



Coordinated By  
**Dr. B. Yogameena**  
Professor, NITTTR Chennai

### Course Layout

- Web designing using HTML, CSS, responsive layouts, Grid, Flexbox, and mobile-first principles.
- JavaScript fundamentals, DOM manipulation, Bootstrap components, accessibility, and SEO basics.
- Multimedia fundamentals: image, audio, video formats, compression, and online delivery.
- Visual content creation using Photoshop, 2D animation tools, and Blender for 3D modeling and animation.
- Video editing, motion graphics, compositing, green screen effects, and multimedia integration with interactivity.



FREE For Learning 3 Credits




  
**Join the Course**
  
**WEB TECHNOLOGIES**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Introduction to the Web & HTML/CSS Basics
- Web Architecture & Layout Tools
- Client-Side Scripting & Advanced Interactions
- Server-Side Scripting with PHP & Database Integration



Coordinated By  
**Dr. S. Sasirekha**  
Associate Professor  
NITTR Chennai



FREE For Learning **2 Credits**




  
**Join the Course**
  
**INFORMATION SECURITY**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Basics of Information Security, Principles (PAIN), RAID
- OS security features and Antivirus
- Network Security & Vulnerabilities - Weaknesses in IP, TCP, HTTP,
- Network devices, and security solutions
- Different types of Network-based Attacks
- Cryptography & Secure Development - Encryption Mechanisms
- PKI, and Secure coding practices
- Network Security Tools - Firewalls
- Intrusion Detection Systems (IDS) \ Intrusion Prevention Systems (IPS), VPN, and content filtering
- Security Standards & Compliance - ISO 27001, IT Act,
- Audits, Business continuity planning



Coordinated By  
**Dr. J. Kokila**  
Assistant Professor,  
IIT, Tiruchirappalli



FREE For Learning **4 Credits**




  
**Join the Course**
  
**COMPUTER PROGRAMMING LAB**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

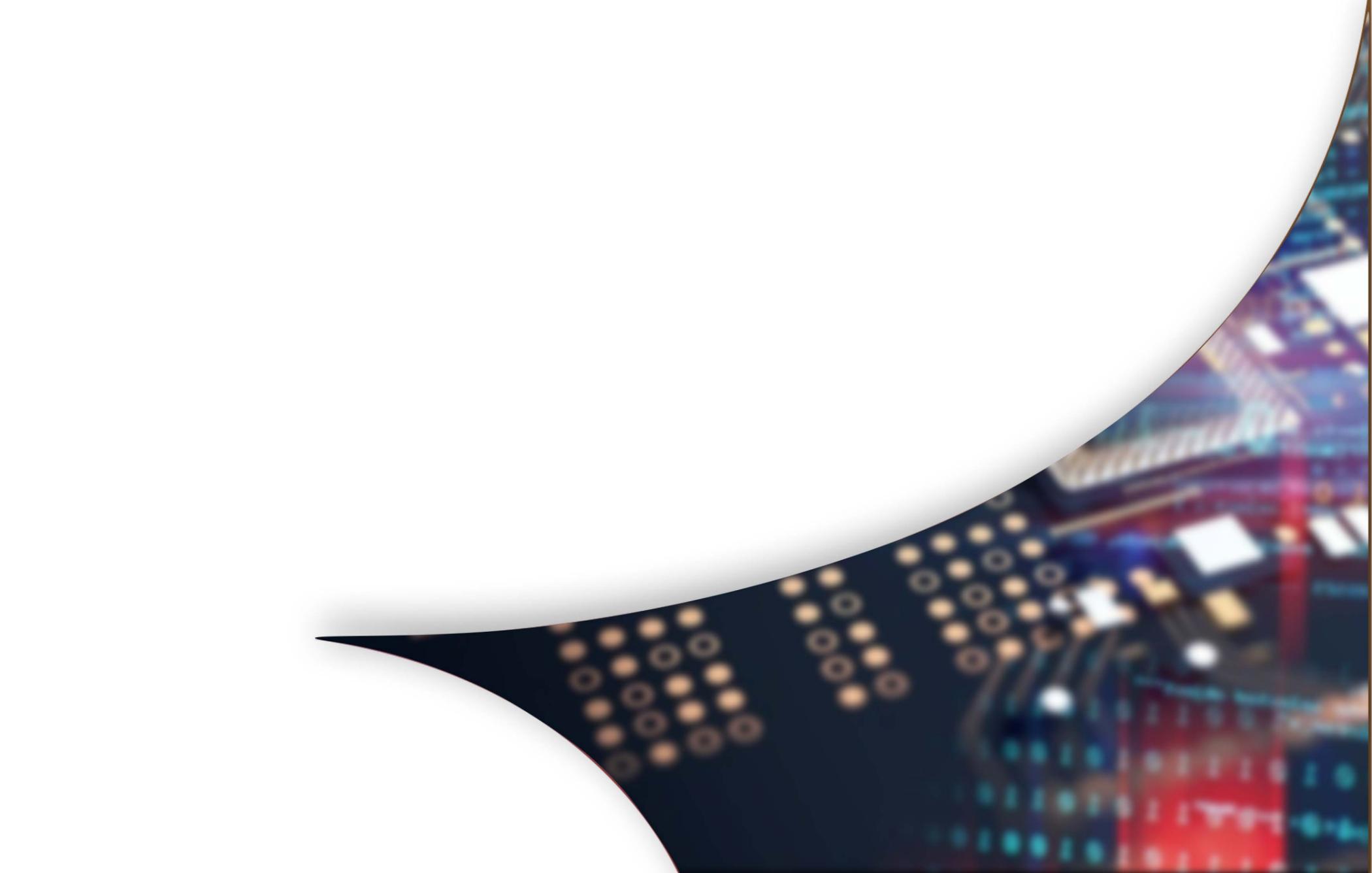
- Basics of I/O, operators, and expression evaluation.
- Decision-making, branching, and looping constructs.
- Arrays, strings, functions, and recursion concepts.
- Pointers, command-line arguments, and dynamic memory handling.
- File operations and data handling techniques.



Coordinated By  
**Dr. T. Sugirtha**  
Assistant Professor,  
IIT Tiruchirappalli



FREE For Learning **3 Credits**



# **Electronics and Communication Engineering**

POWERED BY swayam

Join the Course

# COMPUTER NETWORKING AND DATA COMMUNICATION

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online



Coordinated By  
**Dr. G. Kulanthaivel**  
Professor, NITTTR Chennai

## Course Layout

- Understand fundamental concepts of data communication.
- Differentiate between analog and digital transmission.
- Analyze wireless communication technologies.
- Apply data link layer protocols and error control mechanisms.
- Explain network models, switching techniques, and routing.
- Understand different Transmission Media used and how Transmission Control protocol (TCP) manages reliable data transfer.



FREE For Learning 3 Credits

POWERED BY swayam

Join the Course

# COMMUNICATION TECHNOLOGIES

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online



Coordinated By  
**Dr. R. Krishnamurthy**  
Assistant Professor, IIT Tiruchirappalli

## Course Layout

- Introduction to Communication Technologies
- Analog Modulation Techniques
- Digital Modulation Techniques
- Pulse Modulation Techniques
- Data Communication
- Fiber Optic Communication
- Advance Data Communication



FREE For Learning 3 Credits

POWERED BY swayam

Join the Course

# BASIC ELECTRONICS

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online



Coordinated By  
**Dr. Amrtha Bhide**  
Associate Professor,  
NIT Puducherry

## Course Layout

- Circuit Elements, Laws, and Network theorems
- Semiconductor diodes: types, biasing, applications
- BJTs: Symbols, Configurations, Characteristics, Biasing, Small Signal Amplifier
- OPAMPs: Features, Mathematical Operations, Applications
- Number systems, Digital Codes, Conversions
- Logic gates, Boolean Algebra, Simplification using Karnaugh maps
- Combinational Circuits: Adders, Multiplexers, Encoders, Decoders
- Sequential Circuits: Flip-flops, Counters, Shift Registers - Construction, Diagrams, Applications



FREE For Learning 3 Credits







## Join the Course

### DIGITAL ELECTRONICS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

#### Deals with:

- Number Systems & Boolean Algebra
- Logic Gates, Boolean expressions and simplification of expressions
- Combinational Logic Circuits
- Sequential Logic Circuits, Memory Devices



Coordinated By  
**Dr. P. Sivasankar**  
Professor, NITTR Chennai



**FREE**  
For Learning **3 Credits**







## Join the Course

### DIGITAL COMMUNICATION SYSTEMS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Covers Fundamentals of Digital Communication: System blocks, sampling, PCM, quantization, line coding, and Synchronization.
- Explores Modulation Methods: DM/ADM, DPCM/ADPCM, binary & multilevel schemes (BPSK, FSK, QPSK, QAM, OFDM).
- Explains Baseband Transmission, ISI, Nyquist Criteria, Filtering, Equalization, and DSL Basics.
- Introduces Detection Concepts: ML Detection, Correlation Receivers, SNR, BER, Geometric Signal Representation.
- Includes Information Theory and Channel Coding: Entropy, Capacity, Block Codes, Convolutional Codes, Turbo & LDPC Decoding.



Coordinated By  
**Dr. S. Padmathilagam**  
Assistant Professor,  
IIT Tiruchirappalli



**FREE**  
For Learning **3 Credits**







## Join the Course

### DIGITAL TECHNIQUES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Number Systems, Conversions, and Binary Arithmetic.
- Boolean Algebra, Logic Gates, and Simplification using K-maps.
- Combinational Circuits: Adders, Subtractors, Multiplexers, and Decoders.
- Sequential circuits: Flip-flops, Registers, Counters, and State machines.
- Memory types and Digital System Applications in Embedded and IoT Fields.



Coordinated By  
**Dr. Sunanda Ambulker**  
Assistant Professor, NIT Puducherry



**FREE**  
For Learning **3 Credits**





## Join the Course

# ELECTRONIC DEVICES AND CIRCUITS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Semiconductor Basics: Energy Bands, Carrier Types, and Transport Phenomena.
- PN Diode Behavior, Breakdowns, and Rectifier Circuits; Intro to BJT & MOSFET.
- BJT and MOSFET Operation, Biasing, and Amplifier Configurations.
- Frequency Response Analysis with Capacitances and Miller effect.
- Differential and Operational Amplifiers: Design, Feedback, and Stability.



Coordinated By  
**Dr. Malaya Kumar Nath**  
 Assistant Professor, NIT Puducherry



FREE For Learning 3 Credits





## Join the Course

# EMBEDDED SYSTEMS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Basics of Embedded C for Arduino, Operators, and Arduino IDE setup with sketch design.
- Serial Communication Interface; Boolean, Pointer, Bitwise, and Compound Operations.
- Control Structures and Loop Mechanisms: for, while, do-while.
- Conditional Branching using Expressions and Decision Structures.
- Arduino Mega Overview: Specs, Ports, Digital/Analog Peripherals, and Communication Modules/Interfaces.



Coordinated By  
**Dr. Umashanker Sahu**  
 Professor, NITTTR Chennai



FREE For Learning 3 Credits





## Join the Course

# OPTICAL COMMUNICATION AND NETWORKING

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

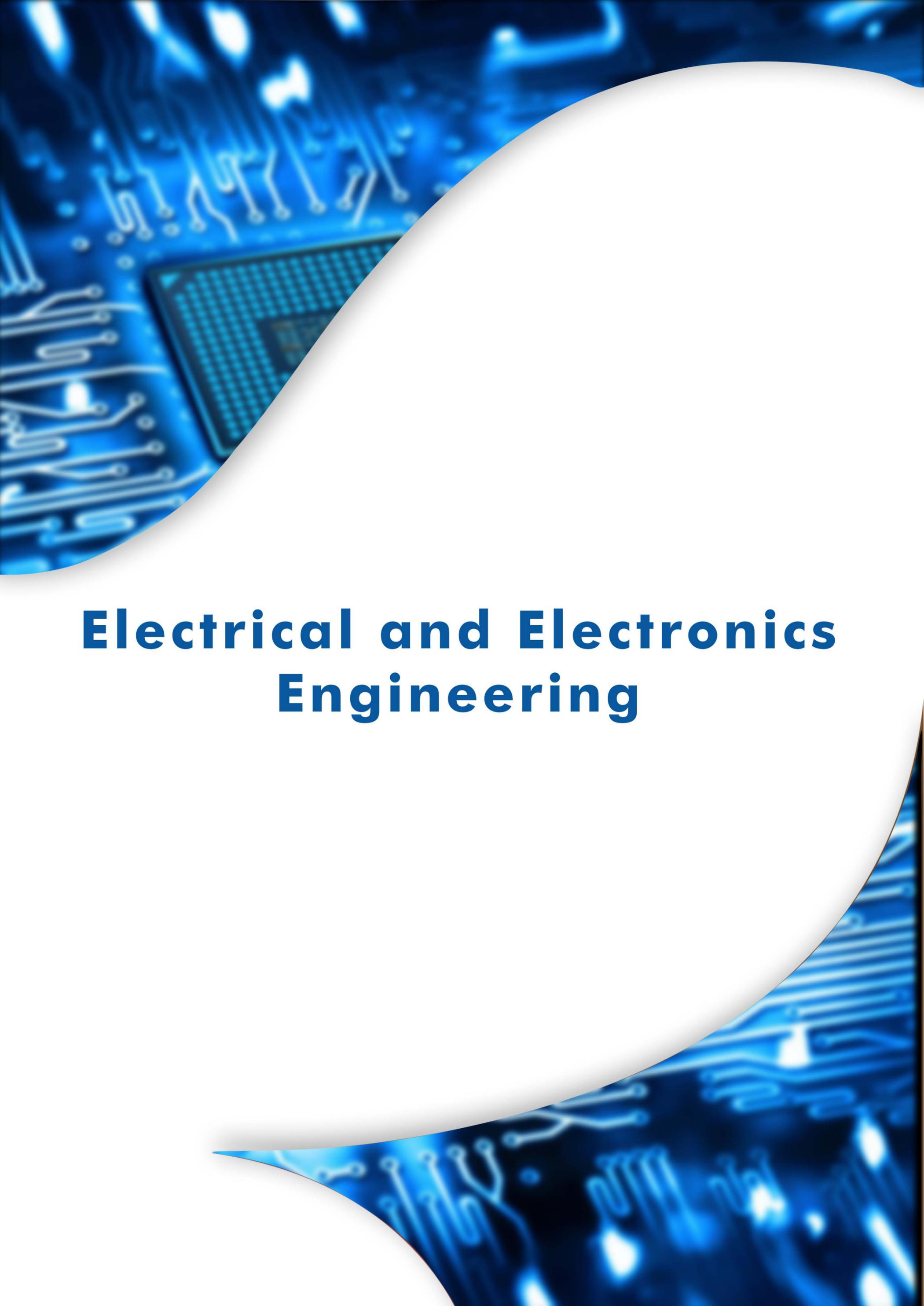
- Optical Fiber Communication Evolution, Basic Laws, Fiber types, and Structures.
- Signal Degradation: Attenuation, Distortion, Dispersion, and Mitigation Techniques.
- Optical sources: LEDs, Lasers, and Photodetectors (PIN, avalanche).
- Optical amplifiers, EDFA, Semiconductor Lasers, and Link Design.
- Optical Networking: WDM, topologies, SONET/SDH, Couplers, Multiplexers, and Network Elements.



Coordinated By  
**Dr. Thomas Joseph**  
 Assistant Professor,  
 NIT Puducherry



FREE For Learning 3 Credits



# **Electrical and Electronics Engineering**


  
**Join the Course**
  
**ELECTRICAL MOTORS AND TRANSFORMERS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- DC Generators
- DC MOTORS
- Single phase Transformers
- Three phase Transformers
- Special Purpose Transformers



Coordinated By  
**Dr. G.A. Rathy**  
Professor, NITTR Chennai



FREE For Learning 3 Credits


  
**Join the Course**
  
**FUNDAMENTALS OF POWER ELECTRONICS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

- Power transistors, IGBTs-operation and applications
- SET and nanotechnology basics
- SCR-types, triggering, commutation, mounting, cooling
- Thyristor Family - Key Devices and Characteristics
- Protection circuits - Snubber, Crowbar, Over-voltage/ Current
- Phase control-single-phase rectifiers, bridge configurations
- Applications - alarms, chargers, lighting, temperature control
- SMPS, UPS (online/offline), SCR-based AC/DC breakers



Coordinated By  
**Dr. M.M. Rajan Singaravel**  
Assistant Professor, NIT Puducherry



FREE For Learning 3 Credits


  
**Join the Course**
  
**ELECTRICAL & ELECTRONIC MEASUREMENTS**
  
 26 January - 30 April 2026
   
 Enrollment Ends : 28 February 2026
   
 Mode : Online

### Course Layout

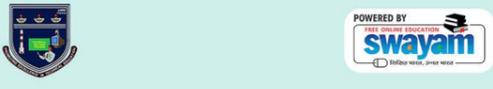
- Basics of measurements, instruments, and calibration with types and characteristics.
- Measurement of voltage, current, and power using DC/AC meters, CT, PT, and wattmeters.
- Range extension, error correction, and power factor analysis methods.
- Energy and resistance measurement using various bridges and meters.
- CRO & DSO: structure, functions, and waveform measurements.



Coordinated By  
**Dr A Hemachander**  
Assistant Professor, NIT Puducherry



FREE For Learning 3 Credits



Join the Course

## ELECTRIC VEHICLES

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online



Coordinated By  
**Dr. A. Hemachander**  
Assistant Professor,  
NIT Puducherry

### Course Layout

- Evolution and Types of EVs
- HEV components, Economic & Environmental Aspects
- Vehicle Dynamics and Drivetrain Configurations
- Powertrain systems
- Motor types and HEV Architectures (series, parallel, etc.)
- DC-DC converters
- Step-up converters
- DC-AC Inverters
- Electric Machines
- Batteries
- Alternative Energy Sources
- Control Systems



FREE For Learning 3 Credits



Join the Course

## FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online



Coordinated By  
**Dr. R. Suja Mani Malar**  
Associate Professor, NITTTR Chennai

### Course Layout

- Electronic Components
- Signals
- Analog Circuits
- Digital Electronics
- Electric & Magnetic Circuits
- AC Circuits
- Transformers
- DC Motors



FREE For Learning 3 Credits



Join the Course

## ELECTRICAL CIRCUITS

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online



Coordinated By  
**Dr. R. Suja Mani Malar**  
Associate Professor, NITTTR Chennai

### Course Layout

- Basic Concepts of Electrical Engineering
- Basic Laws of Electric Circuits
- Network Reduction and Principles of Circuit Analysis
- Network Theorems
- Single Phase A.C Series Circuits
- Single Phase A.C Parallel Circuits
- Resonant Circuits
- Three Phase Circuits



FREE For Learning 3 Credits





## Join the Course

# RENEWABLE ENERGY TECHNOLOGIES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online



Coordinated By  
**Dr. M. Seenuvasan**  
Professor, NITTR Chennai

### Course Layout

- Introduction to Energy Use and Resources
- Renewable Energy Potential and Achievements
- Solar Energy Overview
- Solar Thermal Energy Systems, Thermal Power Generation, Photovoltaic (PV) Technology
- Solar PV Power Generation and Applications
- Wind Energy Overview
- Wind Turbine and Site Selection
- Bio-Energy Technologies, Production and Applications
- Other Renewable Energy Sources (Tidal, Hydro, Geothermal, Hydrogen, Fuel Cell)



FREE For Learning 3 Credits





## Join the Course

# SOLAR POWER TECHNOLOGIES

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online



Coordinated By  
**Dr. Sendhil Kumar Natarajan**  
Professor, NIT Puducherry

### Course Layout

- Solar radiation basics, measurement methods, and earth-sun geometry.
- Solar thermal systems: flat-plate collectors, dryers, ponds, distillation, and performance testing.
- CSP technologies: Fresnel, parabolic trough, towers, dishes, and non-concentrating systems.
- PV principles, modules, system components, MPPT, and grid systems.
- Energy storage methods and economic analysis of solar systems.



FREE For Learning 3 Credits





## Join the Course

# RENEWABLE ENERGY POWER PLANTS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online



Coordinated By  
**Dr. Bijukumar B**  
Assistant Professor,  
NIT Puducherry

### Course Layout

- Renewable energy basics, global demand, and environmental benefits.
- Solar energy: PV principles, modules, MPPT, converters, and system types.
- Wind energy: principles, turbines, site selection, and standalone/grid setups.
- Ocean, tidal, wave, thermal, and small hydel systems with generation schemes.
- Fuel cells, geothermal, biogas, and hydrogen energy fundamentals.



FREE For Learning 3 Credits

POWERED BY swayam

Join the Course

## INDUCTION, SYNCHRONOUS AND SPECIAL ELECTRICAL MACHINES

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online

### Course Layout

- 3-Phase Induction Motor: construction, working, torque-slip, slip effects, power flow, equivalent circuit, tests, starters, speed control, applications
- 3-Phase Synchronous Generator: construction, EMF equation, armature reaction, voltage regulation, applications
- 3-Phase Synchronous Motor: construction, starting, torque characteristics, excitation/load behavior, hunting, losses, efficiency
- Single-Phase Induction Motor: types, torque-slip, working, applications
- Special Motors: universal, repulsion, hysteresis, synchronous and switched reluctance motors
- Advanced Motors: BLDC, PMSM, stepper, AC & DC servomotors



Coordinated By  
**Dr. A. Venkadesan**  
Professor, NIT Puducherry



FREE For Learning 3 Credits

POWERED BY swayam

Join the Course

## ELECTRICAL POWER TRANSMISSION AND DISTRIBUTION

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online

### Course Layout

- **Transmission & Distribution Basics**  
Covers system components, single-line diagrams, voltage levels, and construction of transmission (110–400 kV) and distribution (220 V–33 kV) networks.
- **Line Parameters & Performance**  
Explains RLC parameters, short/medium-line models, efficiency, regulation, transposition, skin and proximity effects.
- **EHVAC & HVDC Transmission**  
Includes EHVAC/HVDC need, components, layouts, advantages, limitations, Ferranti, Corona, FACTS controllers, and wireless power trends.
- **AC Distribution Systems**  
Discusses feeder–distributor design, radial/ring/grid schemes, voltage drop, and 33/11 kV & 11/400 V substation layouts.
- **T&D Components**  
Covers conductors, sag, line supports, insulator types and string efficiency, plus underground cable construction and installation.



Coordinated By  
**Dr. Navin Sam K**  
Assistant Professor,  
NIT Puducherry



FREE For Learning 3 Credits

POWERED BY swayam

Join the Course

## SWITCHGEAR AND PROTECTION

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online

### Course Layout

- Basics of protection: necessity, fault types, protection zones, and backup.
- Circuit interruption devices: fuses, isolators, LT/HT breakers, and GIS selection.
- Protective relays: types, overcurrent, distance, directional, differential, and microprocessor-based relays.
- Alternator and transformer protection: faults, differential protection, Buchholz relay, and reverse power.
- Motor, bus-bar, and transmission line protection: overload, short-circuit, distance, and pilot wire



Coordinated By  
**Dr. Ram Jethmalani C H**  
Assistant Professor, NIT Puducherry



FREE For Learning 3 Credits



The background of the image is a collage of mechanical engineering elements. In the top left, there is a close-up of a large metal gear with a blue-handled tool. Below it, a technical drawing or blueprint is visible. In the bottom right, there is a detailed view of a complex mechanical assembly, possibly a turbine or engine component, with various metal parts and a central shaft. The entire image is overlaid with a large, white, curved shape that frames the central text.

# **Mechanical Engineering**




**Join the Course**  
**INDUSTRIAL AUTOMATION**  
 26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Overview of industrial automation, structure, and modern industry needs.
- Sensors, measurement systems, actuators, and control elements.
- Control technologies, PLC programming, HMI, and SCADA integration.
- Industrial communication, networking, and control applications.
- Emerging trends—IIoT, AI, Industry 4.0, and case-study insights.



Coordinated By  
**Dr. R. Suja Mani Malar**  
 Associate Professor,  
 NITTR Chennai



**FREE**  
For Learning **3 Credits**




**Join the Course**  
**BASIC MECHANICAL ENGINEERING**  
 26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Concept of thermodynamics and laws
- Concept of Heat Engine, Heat Pump & Refrigerator
- Modes of heat transfer & Calculation of Heat transfer coefficient
- Thermal power plant and cycle
- Types of boilers and their structure
- Steam Turbines, Condensers and Cooling Towers
- Internal Combustion Engines and Refrigeration
- Engineering Materials, Classification and their Properties
- Basic manufacturing processes, casting, forging and welding
- Machine tools and nomenclature
- Types of lathe machines and operations
- Milling, Drilling and Grinding machine operations



Coordinated By  
**Dr. Velmurugan C**  
 Assistant Professor,  
 IIT, Tiruchirappalli



**FREE**  
For Learning **4 Credits**




**Join the Course**  
**INDUSTRIAL DRIVES**  
 26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Basics of electric drives, DC motor types, starting, and braking.
- AC motors: single-phase and three-phase induction fundamentals.
- DC drives: phase-controlled, chopper drives, and modern applications.
- AC drives: induction motor control methods and industrial uses.
- Advanced techniques: synchronous, stepper motors, and digital drive control.



Coordinated By  
**Dr. Saravana Prakash P**  
 Assistant Professor,  
 NIT Puducherry



**FREE**  
For Learning **3 Credits**




**Join the Course**  
**MACHINE LEARNING AND PATTERN RECOGNITION**  
 26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Representation of Shapes and Features
- Linear Algebra, Probability, and random Variables
- Regression & Classification
- Performance Evaluation
- Clustering
- Perceptron
- SVM
- Deep Learning and Autoencoder
- RBF & Dimensionality Reduction
- Information Theoretic Learning, Stochastic Learning, Dynamic Programming



Coordinated By  
**Dr. Malaya Kumar Nath**  
 Assistant Professor, NIT Puducherry



**FREE**  
For Learning **3 Credits**

POWERED BY  
**swayam**  
FREE ONLINE EDUCATION

Join the Course

**PLASTICS PRODUCT TESTING**

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online

### Course Layout

- Introduction to plastics testing and sector-wise plastic applications.
- Overview of plastic material properties— physical and mechanical.
- Detailed study of mechanical properties and testing methods.
- Product testing for pipes, fittings, films, and sheets.
- Testing standards for tanks, containers, and related plastic products.



Coordinated By

**Dr. Aswini Kumar Mohapatra**  
Director (Academic/IQAC),  
CIPET

**Mrs Subha Jayaraman**  
Technical Manager,  
CIPET



**FREE**  
For Learning **3 Credits**

POWERED BY  
**swayam**  
FREE ONLINE EDUCATION

Join the Course

**MECHATRONICS AND ROBOTICS**

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online

### Course Layout

- Basics of mechatronics, sensors, and measurement systems.
- Instrumentation and introduction to PLCs.
- PLC programming and industrial applications.
- Robotics fundamentals, drives, end effectors, and sensors.
- Machine vision, robot kinematics, programming, and industrial robotics applications.



Coordinated By  
**Dr. S. Saravana Perumaal**  
Associate Professor, NITTTR Chennai



**FREE**  
For Learning **3 Credits**

POWERED BY  
**swayam**  
FREE ONLINE EDUCATION

Join the Course

**PROCESS AND FABRICATION TECHNOLOGY**

26 January - 30 April 2026  
Enrollment Ends : 28 February 2026  
Mode : Online

### Course Layout

- Covers semiconductor basics: VLSI introduction, device structures, silicon preparation, crystal growth, wafer processing, and defects.
- Explains oxidation, diffusion, and ion implantation processes, systems, mechanisms, and limitations involved in doping.
- Details lithography techniques—optical, electron-beam, X-ray—process steps, comparisons, and limitations.
- Includes etching (wet/dry), thin-film deposition methods like PVD, CVD, epitaxy, vacuum concepts, and scaling impacts.
- Covers metallization, interconnects, packaging, CMP, device fabrication flows (PN, CMOS, BJT, BiCMOS), challenges, engineering techniques, and FinFET process.



Coordinated By  
**Dr. D. Suresh**  
Assistant Professor,  
IIIT Tiruchirappalli



**FREE**  
For Learning **3 Credits**





# **Open Elective**





## Join the Course

### COMMUNICATION SKILLS IN ENGLISH

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Communication Skills - An Introduction
- Elevating Your Vocabulary
- Refining Grammar Skills
- Listening Skills, Speaking Skills
- Reading Skills & Writing Skills
- Soft Skills for Professional Excellence



Coordinated By  
**Dr. K. N. Shoba**  
Associate Professor, NITTR Chennai



FREE For Learning 3 Credits





## Join the Course

### APPLIED PHYSICS-I

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Physical quantities, units (FPS, CGS, SI), measurements, dimensional analysis, unit conversion, equation derivation
- Force and motion, scalar/vector quantities, laws of motion, conservation, applications (rocket propulsion, banking of roads)
- Work, energy, power, friction, energy transformation, power calculation
- Rotational motion, torque, angular momentum, moment of inertia, rigid body applications
- Properties of matter - elasticity, pressure, surface tension, viscosity, fluid dynamics
- Heat and thermometry - heat transfer, temperature scales, thermal expansion (solids, liquids, gases)



Coordinated By  
**Dr. A. Padma Rekha**  
Professor, NITTR Chennai



FREE For Learning 3 Credits





## Join the Course

### DISASTER MANAGEMENT

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to Disaster Management
- Types and Classification of Disasters
- Biological and Technological Disasters
- Human-Made Disasters and Emerging Risks
- The Disaster Management Cycle
- Pre-Disaster Planning and Mitigation
- During-Disaster Management and Response
- Post-Disaster Recovery and Reconstruction
- Disaster Management Frameworks and Policies
- Disaster Management in India
- Applications of Science and Technology in Disaster Management



Coordinated By  
**Dr. M. Seenuvasan**  
Professor, NITTR Chennai



FREE For Learning 3 Credits





## Join the Course

### ENTREPRENEURSHIP AND START-UPS

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Introduction to Entrepreneurship
- Types of Entrepreneurs
- Start-up Ecosystem
- Ideation and Validation
- Business Models
- Financial Planning
- Scaling Start-ups
- Challenges & Sustainability



Coordinated By  
**Dr. P. Jakulin Divya Mary**  
Assistant Professor, NITTR Chennai



FREE For Learning 3 Credits






## Join the Course

# OPERATIONS RESEARCH

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Basics of scientific method, model types, and OR problem-solving approaches.
- Linear programming: formulation, graphical/simplex methods, artificial variables, duality, sensitivity.
- Transportation problems: formulation, optimal and unbalanced cases, degeneracy.
- Assignment problems: formulation and optimal solutions.
- Sequencing (n jobs-2/3 machines) and game theory: minimax, mixed strategies, dominance, LP approach.



Coordinated By  
**Dr. Jagadeeshwar Pashikanti**  
 Assistant Professor,  
 IIIT, Tiruchirappalli



FREE For Learning 3 Credits






## Join the Course

# STUDENT CENTRIC LEARNING

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

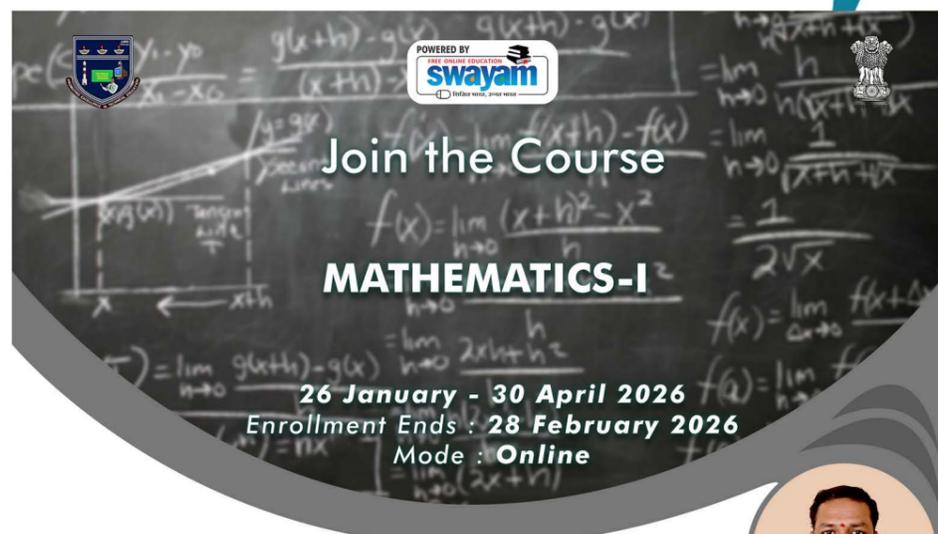
- Introduction to Student-Centric Learning
- Theoretical Foundations of Student-Centric Learning
- Principles and Practices of Student-Centric Classrooms
- Teaching Strategies for Student-Centric Learning
- Assessment in Student-Centric Learning
- Emerging Trends and Innovations
- Student Agency, Voice, and Choice (Empowering Students to lead their learning journey)
- Case Studies



Coordinated By  
**Dr. A. Vinod Kumar**  
 Assistant Professor, NITTTR Chennai



FREE For Learning 3 Credits






## Join the Course

# MATHEMATICS-I

26 January - 30 April 2026  
 Enrollment Ends : 28 February 2026  
 Mode : Online

### Course Layout

- Angles & T-Ratios
- T-Ratio Formulae
- Functions & Calculus
- Complex Numbers - Forms, operations, modulus, conjugate, amplitude, De Moivre's theorem.
- Fractions - Proper/improper fractions and partial fractions with linear/quadratic factors.
- Combinatorics & Theorems - Permutations, combinations, Binomial Theorem and Approximations.



Coordinated By  
**Dr. Jagadeeshwar Pashikanti**  
 Assistant Professor,  
 IIIT, Tiruchirappalli



FREE For Learning 3 Credits



राष्ट्रीय परीक्षा एजेंसी  
National Testing Agency  
Excellence in Assessment

**Exams for the January  
2026 Semester will  
be conducted in  
June, 2026.**



**Exam Type : CBT**

**Exam Registration : To be announced later.**

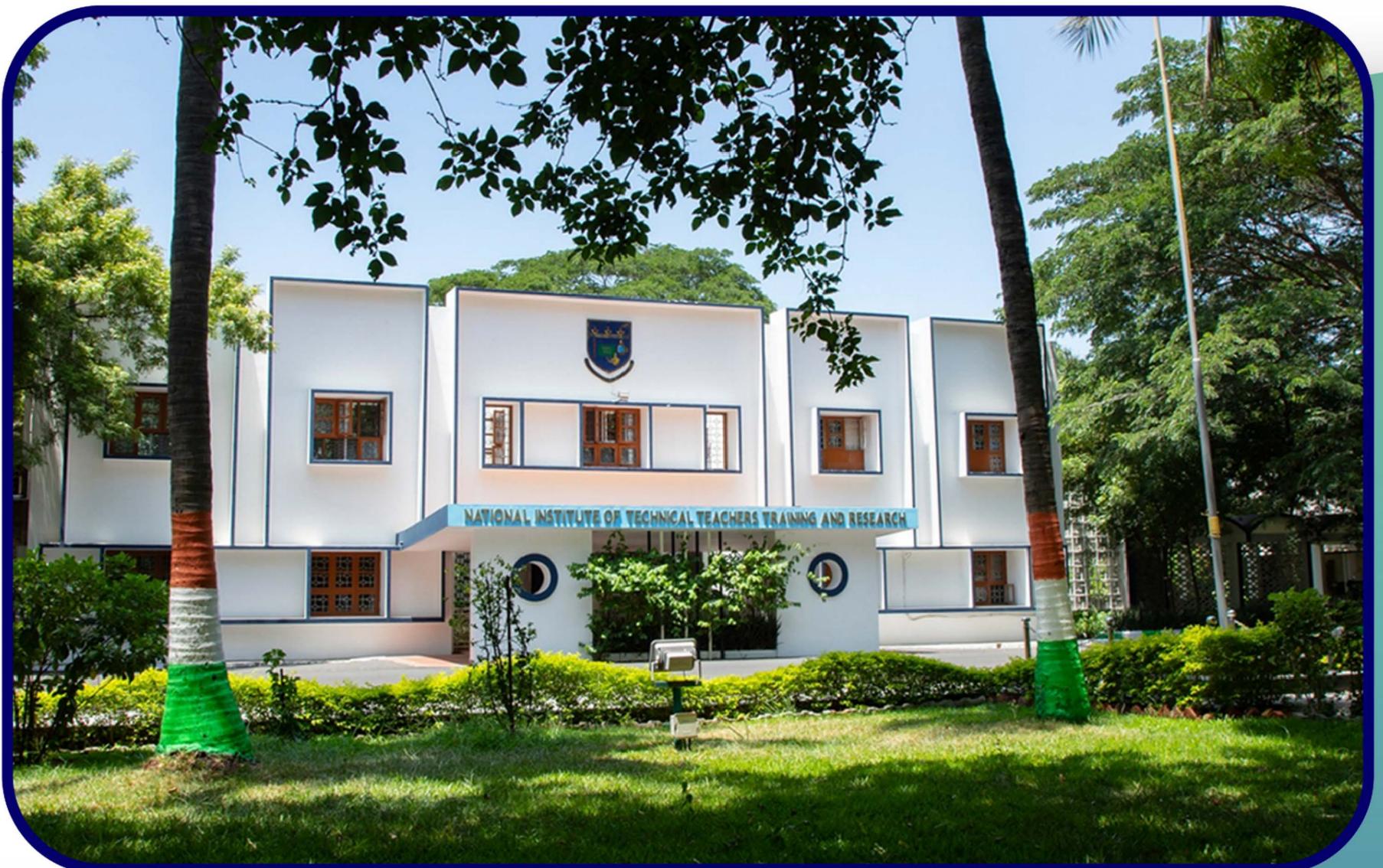


# NITTTR CHENNAI

## NATIONAL COORDINATOR FOR DIPLOMA PROGRAMME

SWAYAM MOOC courses are designed by professors and faculty members from the top educational institutions in India and are available to learners free of charge. The courses include video lectures, reading materials, quizzes, assignments, and online discussion forums to among students facilitate learning and interaction among students and faculty.

One of the unique features of SWAYAM MOOC is that learners can earn certificates upon completion of the courses, which are recognized by educational institutions and employers across India. SWAYAM MOOC is a great resource for individuals who want to improve their skills, knowledge, and career prospects, and it has helped many students across India to access quality education at no cost.





## **NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING AND RESEARCH**

Institution Deemed to be University under Distinct Category,  
A Centrally Funded Technical Institute, Ministry of Education,  
Government of India, Taramani, Chennai - 600113