



**NATIONAL INSTITUTE OF TECHNOLOGY  
WARANGAL**  
Warangal - 506 004, Telangana  
**CENTRE FOR TRAINING AND LEARNING**  
*(Established under the PMMMNMTT Scheme, MoE, Govt. of India)*



**A Six-Day Faculty Development Programme on**  
**“IoT & Machine Learning For**  
**Smart Systems Design”**  
**(Hybrid Mode)**

**25<sup>th</sup> to 30<sup>th</sup> August, 2022**

**Call for Registration and Participation**

**Coordinator**

**Dr. K L V Sai Prakash Sakuru**

*Organized by the*  
**DEPARTMENT OF ELECTRONICS &  
COMMUNICATION ENGINEERING**  
*in Association with the*  
**CENTRE FOR TRAINING AND LEARNING**  
*Established under the Scheme of PMMMNMTT,  
Ministry of Education, Govt. of India*



**Overview of the FDP:**

One of the game-changing technology, “The Internet of Things,” drives today’s world and is responsible for advancements in data analytics, machine learning, and connectivity technologies. AI-driven IoT knocks together intelligent machines that reproduce innovative behavior and reinforce decision-making with little or no human interference.

The future scope of Machine learning-driven IoT in India has a large job opening. By 2025 billions of IoT devices/sensors will be deployed, generating massive amounts of data from these devices. Machine learning has driven Industrial IoT in process control and is a game changer in predictive analytics, predictive maintenance, and automated process for efficiency, profitability, and safe smartness system. Machine learning can help demystify trends and patterns, detect anomalies, enhance decision-making, and predict future model building.

The FDP aims to train the Faculty/Researchers in the area of IoT and Machine learning to cater to the needs of the demand to establish specialized labs and develop research environments in their respective institutions.

**Objectives of the FDP:**

- Recommend and pick right Sensors, Actuators, Communication network, Cloud computing platforms, Machine learning techniques, and Embedded system.
- Understand IoT Architectures, IoT connectivity networks, IoT boards, and Hands-on training to use and design of IoT based systems.
- Understand basics of AI, ML and DL, and administer Supervised learning like regression, Unsupervised Machine learning algorithms like SVM, KNN etc
- Working with data preprocessing and data visualization using R and python.
- Neural networks and multilayer perceptron, Back propagation CNN applications.
- AI/ML with tensor flow on motion sensors for sports and Industrial AI – Smart System Design
- Case Studies – Smart Home, Smart Agriculture, Smart Grid, Smart Vision, ML based securities and Health Care Applications.

**Topics to be covered:**

- **Module-1:** Introduction to IoT, Basics of Sensors & Actuators, Cloud Computing & Machine learning. Introduction to Embedded Systems, IoT architecture. Introduction to various MCUs, GPIOs, ADCs & review of various IoT boards available in the market, Introduction to IoT Programming.
- **Module-2:** Hand on training on Arduino board, ESP32 module, Raspberry Pi board. Use of IDE and Raspbian OS – interfacing Temperature and Humidity sensors, establishing and use of cloud and local servers, Wi-Fi, Ethernet, Bluetooth connectivity for control of devices using the internet and mobile app. Introduction to Industrial IoT 4 & 5.
- **Module-3:** Introduction to Data Science and Machine Learning, Data Analysis & Pre-processing, Neural Networks, Supervised, Unsupervised and Semi-Supervised Learning, Regression and Data Visualization using R, Classifiers, Natural Language Processing, Clustering Algorithms, Reinforcement Learning, Applied Machine Learning using Open-Source Tools, Recommender Systems, Case Studies on Data Science and Machine Learning using Python.
- **Module-4:** Case studies: Smart home, Smart Agriculture, Smart Grid, IoT based Vision application, ML based securities for IoT, and supervised learning based Health Care applications.
- **Module-5:** AI/ML with Tensor Flow on motion Sensors for sports and Industrial AI.

**Resource Persons:**

Eminent Faculty from IITs, NITs, Central Universities, Teaching Learning Centres, Senior Faculty from NIT Warangal and Industry.

**Mode of Delivery:**

**On-campus Lectures and Hands-on training with on-line video and audio link facility.**

**Registration is open to:**

The program is open to all NBA and AICTE approved Engineering/Polytechnic college teachers, Degree college lecturers, Research Scholars and P.G. students. The number of participants is approximately 60 and selection will be based on priority basis. The Brochure and details of the Registration Form can be downloaded from the institute website <http://www.nitw.ac.in>

### How to Register:

Eligible candidates may apply by filling the following Google form by uploading payment proof on or before 20<sup>th</sup> August, 2022.

<https://forms.gle/G1NNcjUnU6LRxYpw6>

**Note:** Keep the payment receipt ready as a PDF file (size < 1 MB)

### Registration Fee:

Category of Participants	6-Day Reg. Fee (INR)
Faculty Members (on-campus)	3000-00
Faculty Members (on-line mode)	2000-00
Research Scholars & PG Students (on-campus)	1500-00
Research Scholars & PG Students (on-line mode)	1000-00
Participants from Industry (on-campus)	3500-00

### Bank Details:

Registration Fee may be remitted through Offline/NEFT/Online to the Bank account given below. Proof of remittance of the requisite registration fee (with transaction number if online transaction) shall be uploaded in the Google Form.

<b>Account Name</b>	COORDINATOR, TLC NITW
<b>Account Number</b>	40376545007
<b>Bank</b>	STATE BANK OF INDIA
<b>Branch</b>	N I T Br (NITW CAMPUS)
<b>IFSC code</b>	SBIN0020149

### Confirmation of Participation:

On receipt of the Google Form and Fee Remittance Receipt, participants will be sent confirmation of their participation through email by 20<sup>th</sup> August 2022. As the programme is conducted online and offline with the number of participants in the workshop is limited to 60 (30 + 30). Candidates are advised to register early to avoid disappointment.

### Brief profile of the Department:

The Department of Electronics and Communication Engineering is one of the country's larger ECE departments among all NITs in India and one of the largest departments of the National Institute of Technology, Warangal (NITW). The ECE Department at NITW has been an international reputation of excellence in teaching, research and service. With excellent laboratory facilities and dedicated faculty, the department of ECE offers broad range of programs that include undergraduate (B. Tech) and post graduate (M. Tech) in Electronics Instrumentation, VLSI System design, Communication Systems and research (Ph. D) programs. Some of the recent sponsored project undertaken by the department includes Radar Emitter Identification using Neural Networks sponsored by DLRL, Hyderabad and Special Manpower Development in VLSI sponsored by MIT-Govt. of India.

### CENTRE FOR TRAINING AND LEARNING:

The Centre for Training and Learning (CTL) has been established at NIT Warangal with grants from the MHRD, through its scheme "Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNTT)". Under this Scheme, a separate building has been built exclusively for the CTL activities, with the state-of-art training facilities that include a studio for production and uploading of video and e-lectures on various subjects of higher education, training halls to train the faculty in various theme areas of Science and Technology, humanities and social sciences, linguistics and communication skills, pedagogy and cognition evaluation, etc. among others. Many senior and young faculty are associated with this Centre as Core-Team. One of the important objectives of the Centre is to conduct training programmes for the aspiring, newly inducted and in-service faculty in science, engineering, social sciences disciplines in higher education. Other activities of the CTL include preparation of print and e-learning materials, offering on-line courses, curriculum design, carrying out research in educational technology and pedagogy and integrating with ICT into teaching-learning process. The CTL has special programmes of training for the marginalized and women-faculty.

### About NIT Warangal:

National Institute of Technology Warangal, formerly known as Regional Engineering College was established in 1959. Over the years it has developed into a premier institute of higher learning and is ranked among the top technical education institutions in India. There are 14 Departments offering eight undergraduate and 31 post-graduate programs besides doctoral programmes. About 5000 students across the country and about 500 international students study on the campus. It is a fully residential campus sprawling over 250 acres with excellent infrastructure in the form of state of the art library, seminar halls, guest houses and research laboratories.

**For any queries regarding the FDP, please contact the Programme Coordinator:**

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**For further details about Teaching Learning Centre, please contact:**

**Prof. DVSS Siva Sarma**

Head, CTL and Coordinator, TLC

Centre for Training & Learning (CTL), NIT Warangal

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PANDIT MADAN MOHAN MALAVIYA TEACHING LEARNING CENTRE

