

# MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY



15/05/2025

to

15/07/2025

## Advanced

## Machine Intelligence and Data Analytics

7th Summer Internship Program 2025



Organized by:

Robotics & Machine Analytics (RAMAN) Lab  
Department of Electrical Engineering

Malaviya National Institute of Technology Jaipur 302017, Rajasthan, India  
[www.mnit.ac.in](http://www.mnit.ac.in), [www.ramanlab.co.in](http://www.ramanlab.co.in)

## About MNIT

Malaviya National Institute of Technology (MNIT) Jaipur is one of the NITs established by Ministry of Human Resource Development, Government of India. The Institute, earlier known as MREC, was established in 1963 as a joint venture of the state and central Governments. Later in 2002, the college was given the status of National Institute of Technology and on August 15, 2007, proclaimed Institute of National Importance through Act of Parliament. MNIT campus spreads over 325 acres of lush green area in the prime location of Jaipur city. At present, in addition to research, consultancy and developmental activities, the Institute offers UG and PG (M. Tech./M.Sc. & Ph.D.) level courses to about 5000 students in almost all leading fields of engineering, technology, management and sciences.

## About Department of EE

The Electrical Engineering Department is one of the oldest departments at MNIT Jaipur. Currently, the department offers undergraduate courses in Electrical Engineering along with postgraduate courses in Power Systems, Power Electronics and Power System Management. The research domains of the department span over various areas of Electrical Engineering. The department continually provides collaborative opportunities with National/International Universities, resulting in a global exposure in research.

## About RAMAN Lab

RAMAN Lab was established in September 2014 by Prof. Rajesh Kumar in the Department of Electrical Engineering at Malaviya National Institute of Technology (MNIT), Jaipur, India. The lab focuses on applying Computational Intelligent techniques in various interdisciplinary research areas, including Control & Robotics, Computer Vision, Bioinformatics, Power and Energy Management, Smart Grid Technologies, Energy-efficient buildings, and Electric vehicles.

## About the Internship

The 7<sup>th</sup> summer internship program (SIP-2025) is designed for understanding and implementing Advanced Artificial Intelligence (AI) and Machine Learning (ML) techniques in different fields. The applications of these techniques are quite broad including areas of engineering, business and medicine. With the growing applications of AI/ML, it is important for engineering UG/PG students and faculty to gain a firsthand experience at implementing the AI/ML techniques on different projects. The internship will provide the participants with an in-depth understanding of various AI and ML Techniques and their programming implementation. The interns will be working on different projects that further enhance the realization of these techniques.

### Coordinator

*Dr. Surender Hans*

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### Expert

*Prof. Rajesh Kumar*

*Dr. Surender Hans*

## General Information

Accommodation and travelling expenses are to be borne by the participants. Limited accommodation on actual charges may be available at MNIT Hostels. A request for hostel accommodation will need to be made in advance. The participant will not be paid any TA/DA. The hostel charges will approximately be Rs 200/day (tentatively). It is to note that limited seats are available in the course (25 seats).

## Important Dates

Last date of registration	13 <sup>th</sup> May, 2025
Confirmation of selection	14 <sup>th</sup> May, 2025
Internship start date	15 <sup>th</sup> May, 2025



## Course Contents

- Simple Linear Regression (LR), Multi LR, Polynomial Regression, Regularization: Ridge, Lasso, Elastic-Net. Regression Metrics.
- Entropy, Information Gain, Support Vector Machines, Ensemble Methods, Bagging, Boosting, Random Forest, Decision Tree.
- Classification Metrics, Gradient Descent (GR), Stochastic GR, Mini-Batch GR, Bias-Variance Trade-off, KNN, PCA, Inferential Statistics.
- K-means, Gradient Boosting, Stacking & Blending, KNN, Naïve Bayes Classifier, SVM, Feature Selection, Hypothesis Testing.

## Prerequisites

- Understanding and working knowledge of Python
- Basics of Linear algebra
- Knowledge of Statistics, Probability.

## List of Projects

- Wrist torque estimation using EMG signal
- EEG based Bicep movement identification
- Emotion Recognition based on EEG signals
- Few shot learning with advance neural networks
- Multi Gesture for stroke rehabilitation using sEMG
- Pathology of colorectal breast, thyroid and gastric cancer
- Membership inference attack on advance neural networks
- Pancreatic Cancer Survival based on Preoperative Features
- Reinforcement learning based signal processing techniques
- A smartphone-based multi-test digitized neurological examination
- Iraqi Hand-Drawing Dataset for Early Parkinson's Disease Detection
- Mammography-based modalities for detecting breast cancer and other disease
- Application machine learning in fuel cells, electrolyzers and various energy systems
- Identification of Human Walking Speed Intent Vertical ground reaction forces during the gait cycle.
- Energy Management in various Energy systems such as Microgrids, Multi-Vectored Energy Systems and Hydrogen Based Systems

## Internship Application Process

Applications are advised to follow the given instructions while registering for the Summer Internship Program.

### Registration Fees

UG Students	Rs. 4720/-
PG students/PhD	Rs. 6490/-
Faculty	Rs. 9440/-

**Note (1): Including 18% GST in the registration fees.**

### Payment Mode

#### Demand Draft:

Demand draft (DD) payable at Jaipur, in name of:  
Registrar (Sponsored Research) MNIT

#### NEFT/IMPS:

Name: Registrar (Sponsored Research) MNIT  
Account No.: 676801700388  
IFSC CODE: ICIC0006768 (ICICI BANK, MNIT)

### Registration Form Details

After fee submission, the applicant must register themselves by submitting details on [Google Form Link](#)

Further details of the internship and instructions for filling the form may be found on [Raman Lab Website](#).

The applicant may also mail the filled registration form (given) with the appropriate requirements to the address of correspondence mentioned.

All registration forms must be received by 13 May, 2025. Registration fee is non-refundable.

The selection for the internship will be on 'first come first served' basis for the limited 25 seats. The confirmation of the selection to attend the course will be emailed by the mentioned date.

For further details about the course, contact [ramanlabmnit@gmail.com](mailto:ramanlabmnit@gmail.com)

## Registration Form

Summer Internship  
on

Advanced Machine Intelligence & Data Analytics  
**Malaviya National Institute of Technology Jaipur**  
15th May, 2025 – 15th July, 2025

Name:

Category (UG/PG/Faculty):

Semester & Department:

Specialization (PG/Faculty):

Institute:

Mailing Address:

Phone (M):

(O)

Email:

### Registration fee Details:

Mode of payment (DD or NEFT/IMPS):

Transaction No./ DD No.

Amount Paid:

The above information is accurate to the best of my knowledge at the time of completion of the form. If selected, I agree to abide by the rules and regulations of the program and MNIT Jaipur.

Date:

Candidate's Signature

The applicant is permitted to participate in the above program for the mentioned duration.

Date:

Signature of HoD with Seal

