Winter School
on
STATISTICAL DATA ANALYTICS
&
DEEP LEARNING-V2

2nd – 11th January 2026 (Hybrid Mode)

Learning in the mountains during Soothing Winters

This program is designed for scholars and working professionals from any discipline who possess a basic understanding of data analysis and deep learning. We have released the first version from June 23-27, 2025 with great success. This is version two with more extended and detailed topics; see the first version from the link: **https://research.iitmandi.ac.in/masterclass/**

Our goal is to provide a rigorous foundation in essential concepts, followed by an introduction to key application areas across diverse fields. The program will culminate in a hands-on, real-world project, enabling participants to apply their learning to practical challenges.

Key Speakers from
- **SMSS Faculty, IIT Mandi**
- **Langley Research Center NASA USA**

Schedule

Module 1: Basics of Programming (needed for DL)
- Introduction to core libraries of Python, such as NumPy and Pandas
- Tensorflow for deep learning

Module 2: Basics of Probability & Statistics (Theory + Practicals)
- Basics of probability, random variables, and distributions
- Starting of a projects with industry relevance (this will undergo all 10 days of the workshop)

Module 3: Data Visualization
- Cases studies
- Different types of directionals plots

Module 4: Classification & Regression Statistical Techniques
- Linear and logistic regression fundamentals
- Regularization techniques (L1, L2)
- Model Evaluation & Validation (ROC, RMSE, F1 Score etc.)

Module 5: Fundamentals of Deep Learning
- Classification and Regression using Neural Networks
- Detailed understanding of components of NNs

Module 6: Core Architectures
- CNNs, ImageNet
- RNNs, LSTMs, and GRUs

Module 7: Transformers
- Transformers: BERT and GPT Overview
- Vision Transformers
- Attention Mechanisms: Seq2Seq, Encoder-Decoder

Module 8: Generative Models
- Autoencoders and Variational Autoencoders (VAE)
- Generative Adversarial Networks (GANs)

Module 9: Generative AIs and Explainability
- Large Language models (LLMs); GPT Family
- Generative AI in practice
- Explainable AI

Module 10: Application and Case Study
- Case Study (Projects): Predicting Rainfall / Air Pollution / Temperature

Registration

Fees
- Offline/Online (For IIT Mandi): INR 5000/-
- Online: INR 8000/- | USD 200/- (foreign nationals)
- Offline (Outside Students): INR 16000/-
- Offline (Working Professionals): INR 24000/-

(prices includes boarding and lodging)

Deadline

Expression of Interest:
20/12/2025
Payment:
30/12/2025

https://forms.gle/vKL2qffkDxz7aDhe8

Target Audience
- **Research Scholars (M.Sc./M.Tech/PhD.)**
- **Working Professionals**
- **Data Enthusiasts**

Organizers

Dr. Sarita Azad
SMSS, IIT Mandi, H.P. India
sarita@iitmandi.ac.in
https://faculty.iitmandi.ac.in/~sarita/

Dr. Rishikesh Yadav
SMSS, IIT Mandi, H.P. India
rishikesh@iitmandi.ac.in
https://sites.google.com/view/yadav-rishikesh

Website:

School of Mathematical & Statistical Sciences (SMSS)
Indian Institute of Technology, Mandi