Organized by
Electronics & ICT Academy

MNIT Jaipur & ABV-IIITM Gwalior
http://www.mnit.ac.in/eict

Online Training Programme
on

Machine Learning-Driven Decision Making in Industrial Systems for World-Class Manufacturing

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Objective (Electronics & ICT Academy-Phase II)

1) To conduct specialized FDPs for faculty/mentor training in line with the vision of MeitY by promoting emerging areas of technology and other high-priority areas that are pillars of both the "Make in India" and the "Digital India" programs.
2) To promote synergy and collaboration with industry, academia, universities and other institutions of learning, especially in emerging technology areas.
3) To support the National Policy on Electronics 2019 (NPE 2019) which envisions positioning India as a global hub for ESDM sector, including MeitY Schemes/policies such as Programme for Semiconductors and Display Fab Ecosystem; India AI; National Programme on AI, Production Linked Incentive Scheme for IT Hardware & Large-Scale Electronics Manufacturing; EMC; SPECS; Chips to System (C2S); etc.
4) To promote standardization of FDPs through Joint Faculty Development Programmes.
5) To support the vision of the National Education Policy (NEP 2020), which mandates that Indian educators go through at least 50 hours in professional development programmes per year.
6) To design, develop & deliver specialised FDPs on emerging technologies/ niche areas/ specialised modules for specific research areas for Faculty in Higher Education Institutions (HEI), besides FDPs on multi- disciplinary areas connected with ICT tools and technologies and other digital hybrid domains, covering a wide spectrum of engineering and non-engineering colleges, polytechnics, ITIs, and PGT educators.

Programme Structure and Modules

This intensive programme aims to introduce state-of-the-art methods for Machine Learning-Driven Decision Making in Industrial Systems. Each module involves a 2-hour lecture with a 2-hour hands-on lab, covering applications in the domain of Industrial systems: Quality Control, Supply Chain & Logistics, Predictive Maintenance, Process Optimization, Computer Vision and MLOps deployment. Experts from IITs, NITs, Industrial Organizations will deliver lectures.

Module 1: Decision Making in Industrial Systems with ML- Descriptive/predictive/prescriptive analytics; the classical industrial analytics (SPC, DOE, OR, Lean/Six Sigma) and where ML arguments traditional decision-making; industrial data sources; OEE, throughput & MTBF/MTTR metrics; end-to-end ML pipeline overview.

Module 2: Quality Control I – ML for SQC, Six Sigma & Defect/Yield Prediction- Cost of quality, Statistical Quality Control (SQC) and the DMAIC cycle; classification/regression for quality prediction; logistic regression, random forests, gradient boosting; handling imbalanced defect data; hands-on defect/yield prediction.

Module 3: Supply Chain I – Demand Forecasting & Inventory Optimization- S&OP/MRP planning hierarchy; ARIMA/SARIMA and inventory policy (EOQ, safety stock); feature engineering for temporal data; ML-based forecasting with gradient boosting and LSTM basics.

Module 4: Predictive Maintenance & Reliability Engineering- Failure modes, FMEA and Total Productive Maintenance (TPM); Remaining Useful Life (RUL) estimation; condition monitoring and sensor fusion; survival analysis and maintenance cost trade-offs.

Module 5: Quality Control II – Multivariate SPC & ML-Based Process Monitoring- Univariate SPC (X-bar/R, CUSUM, EWMA) and its limitations; Isolation Forest, One-Class SVM and autoencoder-based detection; multivariate fault diagnosis and detection-threshold trade-offs.

Module 6: Process & Parameter Optimization- Design of Experiments refresher; surrogate modeling of industrial processes; Bayesian optimization for expensive-to-evaluate trials; evolutionary/genetic algorithms for parameter search.

Module 7: Supply Chain II – Logistics Network Optimization, Vehicle Routing & ML-Driven Scheduling- Network design and facility location; the Vehicle Routing Problem; supplier risk scoring and delivery-delay prediction; reinforcement learning for dispatch/scheduling.

Module 8: Computer Vision for Quality Inspection, Safety & Ergonomics- CNNs for automated visual inspection; RNN/LSTM and Transformer basics for sequential data; computer vision for PPE detection and edge AI for real-time inspection

Module 9: Digital Twins, Simulation & Explainable Decision Support – Digital twins and discrete-event simulation; model interpretability with SHAP and LIME; trustworthy AI, trends in AI/ML for industrial decision support.

Programme Coordinators	
Dr. Gunjan Soni, MNIT Jaipur	***Prof. Gyan Prakash and Dr. Amandeep Kaur, ABV IIITM Gwalior***
FDP Programme Secretariat – Mobile: +91-9549654559; Email: fdp.academy@mnit.ac.in	

Registration Fee (Payment through online transfer) — **QR code for Payment**

Applications are invited on a first-come, first-served basis. from faculty members, working professionals, industry professionals, doctoral, postgraduate and advanced undergraduate students from all over the world

India/SAARC/Africa		Rest of the World
Academia (Faculty/Students)	Others	Academic and others
Rs. 750/- (18% GST extra)	Rs. 1500/- (18% GST extra)	US $ 60/- (18% GST extra)

Note: Registration fee once paid will not be refunded back.

Malaviya National Institute of Technology Jaipur is one of the oldest NITs, the institute has a rich heritage of sixty years producing world class engineers, managers, architects and scientists. Ranked 42nd nationally in the NIRF ranking-2025 (Engineering), the institute offers learning opportunities for undergraduate, postgraduate students, and researchers in various domains. Having a lush green campus of over 317 acres within the heart of the pink city, close to Jaipur International Airport, the campus offers a safe and lively environment. A world class teaching infrastructure, state-of-art laboratories welcome you at the campus. The institute has a vision to impart education of international standards and conduct research at the cutting edge of technology.

ABV Indian Institute of Information Technology and Management Gwalior is an apex Information Technology and Management Institute, established by the Government of India. The Institute endeavours to carve young minds through quality teaching and develop them as tomorrow's leaders. The Institute's mandate is to create Information Technology enabled Management solutions. The Institute offers various programmes at Masters and Doctoral level. The Institute's activities are aimed at developing amongst students an inquisitive mind and a culture of camaraderie and research.