REPORT

ON

AICTE ATAL FDP

"Bridging Academia and Industry: Future Skills in Digital Manufacturing & Automation"

23rd to 28th JUNE 2025

ORGANIZED BY: DEPARTMENT OF MECHANICAL ENGINEERING

VIDYA PRATISHTHAN'S KAMALNAYAN BAJAJ INSTITUTE OF ENGINEERING AND TECHNOLOGY, BARAMATI

Approved by AICTE, New Delhi, Government of Maharashtra, and SPPU Pune (An Autonomous Institute)

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Report on the Successful Completion of AICTE-ATAL Sponsored FDP

The AICTE-ATAL Sponsored Faculty Development Program (FDP) on "Bridging Academia and Industry: Future Skills in Digital Manufacturing & Automation" was successfully conducted in offline mode from 23rd to 28th June 2025 at Vidya Pratishthan's Kamalnayan Bajaj Institute of Engineering & Technology (VPKBIET), Baramati. The program was organized by the Department of Mechanical Engineering under the coordination of Dr. S. M. Bhosle and Dr. C. B. Nayak.

Inauguration:

The inaugural ceremony was held on 23rd June 2025 from 9:00 to 9:30 AM, graced by **Dr. Sudhir B. Lande**, Principal, VPKBIET, as Chief Guest, along with dignitaries from the institute. Dr. Bhosle welcomed the participants and shared the FDP's vision, followed by keynote addresses by senior faculty highlighting the relevance of digital transformation in education and industry.

Technical Sessions:

Over six days, the FDP featured **10 expert-led sessions**, each focusing on emerging trends in Industry 4.0, digital manufacturing, and automation. Key highlights include:

- **Dr. Abhishek Patange (ABB Bengaluru)** delivered insights on machine learning-based monitoring of machining centers and the use of generative AI in domain-specific LLMs.
- **Mr. Anush Mishra (ABB Bengaluru)** spoke on digital twins and manufacturing analytics, as well as the challenges and future trends in robotics and automation.
- **Mr. Gaurav Mapari (Pattern Technologies)** presented on digital twins in smart manufacturing and hybrid models for digital twins.
- **Dr. Aarati Muley (COEP Tech)** introduced participants to smart additive manufacturing techniques.
- **Dr. N. K. Chougule and Dr. Mahesh Jaybhaye (COEP Tech)** addressed the integration of the National Education Policy and sustainable digital manufacturing practices.
- **Dr. Bubathi Muruganantham (Honeywell, Pune)** shared expertise on AI applications in predictive maintenance and quality control.

The speakers for the 6-day workshop on "*Bridging Academia and Industry: Future Skills in Digital Manufacturing & Automation*" were:

Resource Person's Name	Dr. Abhishek D. Patange
Designation	Data Science & AI Specialist
Organization's Name	ABB Global Industries and Services Pvt. Ltd., Bengaluru.
Brief Professional Bio-data	

With a rich background in engineering research, Dr. Abhishek brings valuable expertise to his current role as a Data Science and AI Specialist at ABB's Center of Excellence in Process Automation Digital. At ABB, he has made significant contributions, including the design and development of an end-to-end framework for digitized maintenance features under ABB Genix's APM 360. He has created advanced models using ML algorithms tailored for predictive and diagnostics analytics, implemented robust data processing pipelines, and worked closely with platform architects to ensure seamless integration and ease of use for end-users. This role has enabled a seamless transition of his career into software-focused work, strengthening mechanical systems, blending his engineering expertise with cutting-edge technology in AI and data science. His efforts were recognized with the Rising Star Award at ABB for exceptional contributions. Additionally, he secured 2nd position in ABB's global hackathon, ABB Accelerator, for a Generative AI project, where he proposed and developed Gen AI-based features for ABB Genix's APM platform.

Dr. Abhishek holds a PhD in Mechanical Engineering from VIT Chennai, and before joining ABB. he has 7 years of academic experience as an Assistant Professor in Mechanical Engineering at COEP, Pune, where he cultivated proficiency in machine learning, condition monitoring, mechatronics, and mechanical design engineering. He successfully secured research grants, notably the SERB-SURE grant of ₹30 lakhs for Prognostics and Health Monitoring of a machining center incorporating a digital twin and the ERASMUS Lump Sum grant of ₹90 lakhs for Agricultural Revitalization in Higher Education Institutions.

His research contributions have been rewarded with 50+ publications in SCI journals, 2 Indian patents, and 1100+ citations. Dr. Abhishek's passion for teaching remains evident as he has seamlessly transitioned from academia to industry while maintaining an interest in engineering research. Beyond his professional pursuits, he is a dedicated listener of Indian classical music.

Session -1	**Date: 23/06/2025**
Topic	Machine Learning–Based Monitoring and Maintenance of Machining Centre
Abstract	As the manufacturing industry advances toward Industry 4.0, the integration of machine learning (ML) in monitoring and maintenance processes is transforming the performance and reliability of machining centres. This session explores the development and application of ML algorithms to enable predictive maintenance, anomaly detection, and real-time monitoring in machining environments. By leveraging data from sensors, machine logs, and control systems, machine learning models can detect early signs of wear, tool failure, or process deviation, significantly reducing unplanned downtime and maintenance costs. The session will cover a range of topics, including data acquisition and preprocessing, model selection and training, deployment of ML solutions on shop floors, and integration with existing manufacturing systems. Case studies and recent research findings will illustrate the practical benefits and challenges of implementing such technologies in industrial settings. Attendees will gain insights into how ML-driven strategies can enhance productivity, extend equipment life, and support the shift toward smart, autonomous manufacturing systems.

Session -2	**Date: 23/06/2025**
Topic	Using Generative AI to Build Domain-Aware LLMs for Machine Tools Monitoring
Abstract	As machine tools become increasingly digitized and complex, the need for intelligent, context-aware monitoring solutions is greater than ever. This session focuses on how generative AI, particularly large language models (LLMs), can be harnessed to create domain-specific tools that understand and interpret data from machine tools with high accuracy. We explore methodologies for fine-tuning foundation models using technical documentation, sensor data, and maintenance logs to produce LLMs that are both knowledgeable and reliable in manufacturing environments. These domain-aware models enable enhanced anomaly detection, root cause analysis, and natural language interaction for maintenance and monitoring systems. Attendees will learn how generative AI can bridge the gap between unstructured machine tool data and actionable insights, offering scalable solutions for improving productivity, reducing downtime, and supporting predictive maintenance strategies. Practical examples and implementation pathways will be discussed, demonstrating how these advanced models are shaping the future of intelligent manufacturing.

Resource Person's Name	Mr. Anusha Mishra
Designation	Data Science & AI Specialist
Organization's Name	ABB Global Industries and Services Pvt. Ltd., Bengaluru.

Brief Professional Bio-data

Mr. Anush Mishra is a Data Science and AI Specialist at ABB Global Industries and Services Pvt. Ltd., Bengaluru. With a strong background in artificial intelligence, machine learning, and data analytics, he is actively involved in developing intelligent solutions for industrial automation and smart manufacturing systems. At ABB, he contributes to cutting-edge projects that enhance operational efficiency and predictive capabilities across global engineering platforms.

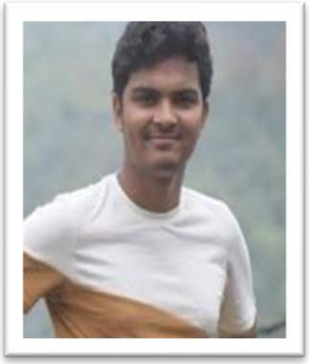
Anush is also a UCMAS World Champion, recognized for his exceptional mental arithmetic abilities and analytical thinking from a young age. His unique blend of technical expertise and cognitive excellence drives innovation in both industry and academia. He is passionate about applying AI to solve real-world challenges and often shares his knowledge through talks, workshops, and technical forums. Mr. Mishra continues to inspire young professionals with his commitment to data-driven innovation and his journey from a prodigy to an industry expert.

Session - 3	**Date: 24/06/2025**
Topic	Digital Twins for Industry 4.0 & Manufacturing Analytics
Abstract	Digital Twins are rapidly emerging as a cornerstone technology in the era of Industry 4.0, enabling real-time visualization, simulation, and optimization of physical manufacturing systems. By integrating sensor data, machine learning, and analytics, Digital Twins create virtual replicas that mirror the behavior and performance of physical assets. This empowers manufacturers to predict failures, improve efficiency, and enhance decision-making across the production lifecycle. Combined with manufacturing analytics, Digital Twins facilitate proactive maintenance, process optimization, and adaptive control. This Session highlighted the transformative potential of Digital Twins in driving intelligent, data-driven manufacturing for increased agility, productivity, and sustainability in modern industrial environments.

Session - 4	**Date: 24/06/2025**
Topic	Challenges and Future Trends in Digital Manufacturing and Robotics
Abstract	Digital manufacturing and robotics are transforming industrial landscapes through automation, connectivity, and intelligent systems. However, several challenges persist, including integration of legacy systems, cybersecurity risks, high implementation costs, and the need for a skilled workforce. Interoperability among diverse platforms and ensuring real-time data accuracy remain critical hurdles. Despite these challenges, future trends indicate a strong shift towards AI-driven robotics, cloud-based manufacturing, digital twins, and human-robot collaboration. Advancements in 5G, edge computing, and sustainable automation are expected to further accelerate this transformation. This session outlined key barriers and emerging directions shaping the future of digital manufacturing and robotic technologies.

Resource Person's Name	Mr. Gaurav Laxman Mapari
Designation	Data & Applied Scientist
Organization's Name	Pattern Technologies India Pvt Ltd., Pune

Brief Professional Bio-data



Mr. Gaurav Mapari, a distinguished Data Science and AI Specialist with over 4 years of experience in developing enterprise-scale AI/ML solutions. With a proven track record of driving innovation and delivering measurable business impact, Mr. Mapari has led the development of multiple AI/ML solutions, resulting in significant reductions in equipment downtime and energy savings. His expertise spans predictive maintenance, forecasting, and LLM applications, with a strong background in machine learning, natural language processing, and MLOps.

As a speaker, Mr. Mapari brings a wealth of knowledge and experience in transforming complex problem statements into actionable AI solutions. He has worked with leading organizations, including ABB and HCL Technologies, and has developed innovative solutions such as unsupervised anomaly detection systems and AI-driven digital twin applications. With his achievements recognized through awards like the Innovation Trailblazer Award and Team Excellence Award, Mr. Mapari is well-equipped to share his insights and expertise with us. Let's welcome him to the Faculty Development Program on Future Skills in Digital Manufacturing and Automation.

Session - 5	**Date: 25/06/2025**
Topic	Hybrid Model for Digital Twins
Abstract	A Hybrid Model for Digital Twins combines physics-based modeling with data-driven machine learning approaches to enhance accuracy, adaptability, and predictive capabilities in smart manufacturing systems. This integrated framework leverages the strengths of both models—physical models ensure interpretability and adherence to engineering principles, while data-driven models offer adaptability to complex, nonlinear behaviors through real-time data analysis. The hybrid approach enables more robust simulations, diagnostics, and control strategies, particularly in dynamic and uncertain industrial environments. By unifying these paradigms, the hybrid model facilitates improved decision-making, optimized performance, and accelerated innovation, establishing a powerful foundation for next-generation Digital Twin applications in Industry 4.0.

Session - 6	**Date: 25/06/2025**
Topic	Digital Twins in Smart Manufacturing
Abstract	Digital Twins play a pivotal role in advancing smart manufacturing by creating dynamic virtual replicas of physical systems, enabling real-time monitoring, simulation, and optimization. By integrating data from IoT sensors, machine learning algorithms, and advanced analytics, Digital Twins enhance decision-making, predictive maintenance, and process efficiency. They bridge the gap between the physical and digital worlds, allowing manufacturers to anticipate failures, reduce downtime, and improve product quality. As industries move toward more autonomous and adaptive systems, Digital Twins serve as a foundational technology in achieving agility, scalability, and sustainability, making them essential for the evolution of Industry 4.0 and beyond.

Session - 7	**Date: 26/06/2025**
Topic	Smart Additive Manufacturing
Abstract	Smart Additive Manufacturing (SAM) integrates advanced sensing, data analytics, and intelligent control systems into traditional 3D printing processes to enhance precision, customization, and efficiency. By leveraging real-time monitoring, AI algorithms, and closed-loop feedback, SAM enables adaptive process control, defect prediction, and in-situ quality assurance. This intelligent manufacturing approach supports complex geometries, material efficiency, and rapid prototyping across industries such as aerospace, healthcare, and automotive. As part of the Industry 4.0 ecosystem, Smart Additive Manufacturing contributes to agile production, reduced lead times, and sustainable manufacturing practices, paving the way for highly automated, data-driven, and resilient production environments.

Resource Person's Name	Dr. Arati V. Mulay
Designation	Associate Professor
Organization's Name	COEP Technological University, Pune

Brief Professional Bio-data

Dr. Arati Mulay is an esteemed academician and Associate Professor in the Department of Production Engineering at the College of Engineering Pune (COEP), one of India's premier engineering institutions. With over two decades of teaching and research experience, she has significantly contributed to the fields of manufacturing systems, production planning, industrial engineering, and operations management.

She is known for her impactful teaching methods and has mentored numerous undergraduate, postgraduate, and doctoral students. Dr. Mulay has actively contributed to curriculum development and academic reforms aimed at bridging the gap between industry and academia. Her research work spans productivity improvement, lean manufacturing, and sustainability in production, and she has published widely in reputed national and international journals. Dr. Mulay has also played a pivotal role in fostering industry-institute interaction and has been involved in organizing various workshops, FDPs, and training programs that empower faculty and students with emerging industrial skills. Her dedication to academic excellence and her initiatives to integrate digital and smart manufacturing concepts into engineering education make her a valuable contributor to the advancement of technical education in India.

Session - 7	**Date: 26/06/2025**
Topic	Smart Additive Manufacturing
Abstract	Smart Additive Manufacturing (SAM) integrates advanced sensing, data analytics, and intelligent control systems into traditional 3D printing processes to enhance precision, customization, and efficiency. By leveraging real-time monitoring, AI algorithms, and closed-loop feedback, SAM enables adaptive process control, defect prediction, and in-situ quality assurance. This intelligent manufacturing approach supports complex geometries, material efficiency, and rapid prototyping across industries such as aerospace, healthcare, and automotive. As part of the Industry 4.0 ecosystem, Smart Additive Manufacturing contributes to agile production, reduced lead times, and sustainable manufacturing practices, paving the way for highly automated, data-driven, and resilient production environments.

Resource Person's Name	Dr. Nagesh K. Chougule
Designation	Professor & Head Mechanical Engineering
Organization's Name	COEP Technological University, Pune

Brief Professional Bio-data

Prof. (Dr.) Nagesh Chougule Kallappa is the Head of the Mechanical Engineering Department at COEP Technological University, Pune, and oversees the CAD/CAM/CAE Center. With over 32 years of teaching and consulting experience in CAD/CAM/CAE, he is a respected academician and mentor, currently guiding four Ph.D. scholars. He has authored four textbooks and developed multiple mechanical engineering software tools.

Prof. Chougule has visited several international universities and has a substantial number of research publications in reputed national and international journals. For the past eight years, he has been conducting specialized certification courses in CAD/CAM/CAE and PLM software for faculty and industry professionals under the institute's Continuing Education Program (CEP).

He is a life member of ISTE and IAENG, and also serves as a Board of Studies (BOS) member at DKTE, Ichalkaranji, as a Shivaji University Vice-Chancellor nominee. His contributions significantly impact both academic and industrial communities.

Session - 8	**Date: 26/06/2025**
Topic	National Education Policy (NEP) 2020
Abstract	The National Education Policy (NEP) 2020 marks a transformative shift in India's education system, aiming to make it more holistic, flexible, multidisciplinary, and aligned with the needs of the 21st century. It emphasizes foundational literacy and numeracy, experiential learning, and competency-based education across all levels. Key reforms include a new 5+3+3+4 school structure, integration of vocational education, promotion of regional languages, and a focus on critical thinking and creativity. In higher education, NEP advocates for multidisciplinary institutions, academic credit banks, and increased autonomy. The policy envisions inclusive, equitable, and innovative education to empower learners and drive national development.

Resource Person's Name	Dr. Maheshwar D. Jaybhaye
Designation	Associate Professor
Organization's Name	COEP Technological University, Pune

Brief Professional Bio-data

Dr. Mahesh Jaybhaye is an Associate Professor at COEP Technological University, Pune, with a strong academic and research background in mechanical engineering. He has over 15 years of experience in teaching, research, and consultancy, with core expertise in areas such as thermal engineering, renewable energy systems, and advanced manufacturing technologies.

Dr. Jaybhaye is known for his student-centric approach and active involvement in academic development and curriculum innovation. He has guided numerous undergraduate and postgraduate research projects and has several publications in reputed national and international journals to his credit. His research contributions focus on sustainable technologies and energy efficiency, aligning with industry and societal needs.

He also actively participates in faculty development initiatives, technical events, and interdisciplinary collaborations. Dr. Jaybhaye's commitment to quality education and research excellence continues to contribute significantly to the academic ecosystem of COEP Technological University and the wider engineering community.

Session - 9	**Date: 27/06/2025**
Topic	Sustainable and Green Manufacturing through Digital Technologies
Abstract	Sustainable and green manufacturing through digital technologies represents a transformative approach to reducing environmental impact while enhancing productivity and efficiency. By integrating digital tools such as IoT, AI, Digital Twins, and data analytics, manufacturers can monitor energy consumption, minimize waste, optimize resource utilization, and enable real-time decision-making for eco-friendly operations. These technologies support circular economy practices, predictive maintenance, and carbon footprint reduction across the production lifecycle. This digital transition not only aligns with global sustainability goals but also promotes innovation, regulatory compliance, and long-term economic viability. The approach paves the way for a cleaner, smarter, and more resilient manufacturing future.

Resource Person's Name	Dr. Bubhati Muruganantham
Designation	Associate Professor
Organization's Name	COEP Technological University, Pune

Brief Professional Bio-data

Dr Bubathi Muruganantham is working as an Application Engineering Manager in Honeywell Industrial Automation, India, where he leads efforts in predictive maintenance and supports the global business development activities for the IIOT portfolio. Overall, he has 17 years of R&D experience and has worked previously with GE Global Research, Eaton Research Labs.

He has received the B.E. degree (Electrical Engineering) from Anna University, India, and Ph.D in the field of Bearing Condition Monitoring from Homi Bhabha National Institute, India (Indira Gandhi Centre for Atomic Research, India). His expertise includes signal processing and machine learning methods for condition monitoring in electrical, hydraulics, and aerospace domains with 3 Patent provisional applications, 1 Trade secrets, 4 Journal papers, and 10 invited talks in India and globally.

Session - 10	**Date: 28/06/2025**
Topic	AI and Machine Learning in Predictive maintenance and Quality control
Abstract	The integration of AI and Machine Learning (ML) into predictive maintenance and quality control is transforming the manufacturing industry. This talk will delve into various AI methodologies, including machine learning, computer vision, and natural language processing (NLP), and their impact on production processes. Machine learning-based fault detection uses historical data to predict equipment failures, reducing downtime and maintenance costs. Techniques like anomaly detection and supervised learning identify patterns and predict faults accurately. Machine vision systems employ image processing algorithms to inspect products for defects, ensuring consistent quality. Digital twins, virtual replicas of physical assets, enable real-time monitoring and simulation, aiding proactive maintenance. Real-world applications are evident across industries. In process industries, predictive maintenance monitors asset health, reducing breakdowns and enhancing safety. In Assembly lines or castings, machine vision detects defects, ensuring reliability. These examples demonstrate the tangible benefits of AI-driven predictive maintenance and quality control. Ongoing research aims to enhance the accuracy and efficiency of these systems, focusing on advanced algorithms, IoT integration for real-time data, and NLP for analyzing maintenance logs. These advancements promise further optimization of production processes, cost reduction, and improved product quality. In conclusion, AI and ML are revolutionizing predictive maintenance and quality control, offering unprecedented efficiency and reliability in manufacturing.

The schedule of the workshop was as follows:

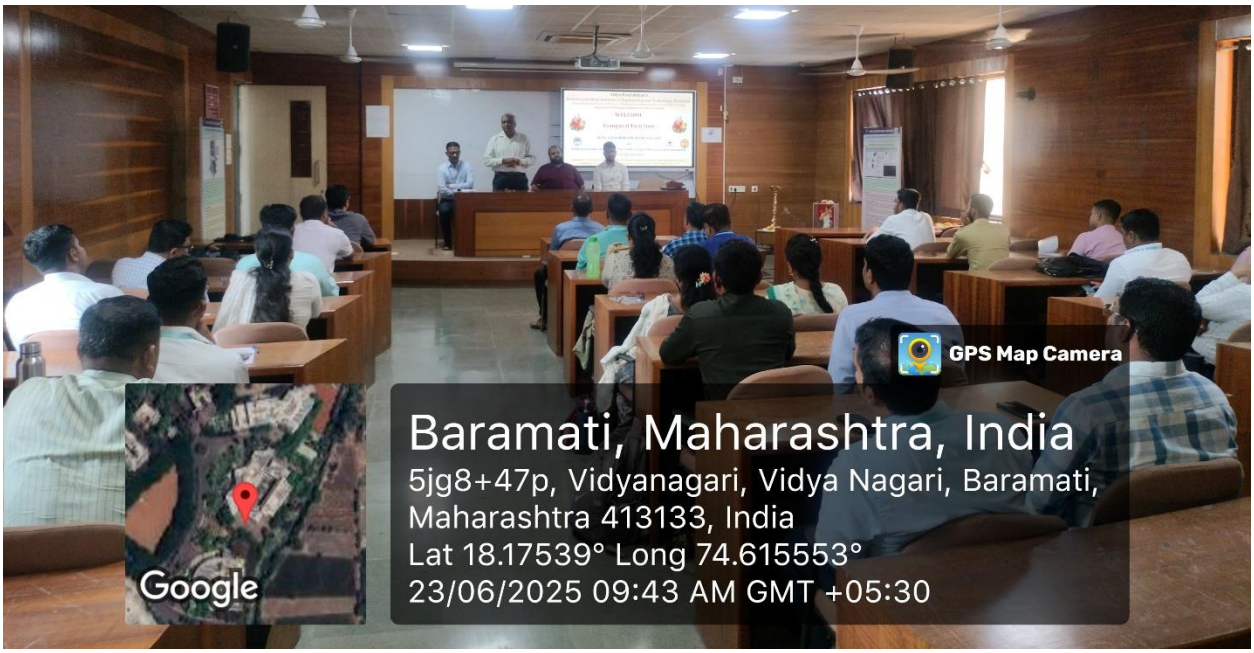
FDP Start Date : 23/06/2025 **FDP End Date:** 28/06/2025

Day 1 (23/06/2025)	Day 2 (24/06/2025)	Day 3 (25/06/2025)	Day 4 (26/06/2025)	Day 5 (27/06/2025)	Day 6 (28/06/2025)
9:00 – 9:30 Inauguration					
9:30 – 12:00: Session 1 **Name of the Expert:** *Dr. Abhishek D Patange* **Designation:** *Data Science & AI Specialist.* **Organization:** *ABB Global Industries and Services Pvt. Ltd., Bengaluru.* **Experience in Years:** *13 Years.* **Topic:** *Machine Learning–Based Monitoring and Maintenance of Machining Centers*	**9:30 – 12:00: Session 3** **Name of the Expert:** *Anush Mishra* **Designation:** *Data Science and AI Specialist at ABB | UCMAS World Champion.* **Organization:** *ABB Global Industries and Services Pvt. Ltd., Bengaluru.* **Experience in Years:** *12 Years.* **Topic:** *Digital Twins for Industry 4.0 & Manufacturing Analytics.*	**9:30 – 12:00: Session 5** **Name of the Expert:** *Mr. Gaurav Mapari.* **Designation**: Data & *Applied Scientist.* **Organization:** Pattern Technologies India Pvt. Ltd. **Experience in Years:** *11 Years.* **Topic:** *Digital Twins in Smart Manufacturing.*	**9:30 – 12:00: Session 7** **Name of the Expert:** *Dr Aarati Muley.* **Designation:** *Associate Professor.* **Organization:** *COEP Technological University, Pune.* **Experience in Years:** *22 Years.* **Topic:** *Smart Additive Manufacturing.*	**9:00 – 1:00: Industrial visit** **Name of the Organization:** *Visit to Bharat Forge Ltd.* **Complete address with Pin code:** *Maharashtra Industrial Development Corporation Area, Baramati, Maharashtra 413133* **Industry Type:** *Manufacturing* **Area of specification:** *Bharat Forge Limited (BFL) is an Indian multinational technology-driven global leader in metal forming. The company has transcontinental presence across eight manufacturing locations, serving several sectors including automotive, power, oil and gas, construction & mining, locomotive, marine, and aerospace.*	**9:30 – 12:00 Noon Session 10** **Name of the Expert:** *Dr. Bubathi Murugananthan* **Designation:** *Application Engineering Manager.* **Organization:** *Honeywell Ltd, Pune.* **Experience in Years:** *12 Yrs.* **Topic:** *AI and Machine learning in Predictive Maintenance and Quality Control.*
12:00 – 1:00 **Article Discussion** **Title of the Research Paper :** *A machine learning approach for vibration-based multipoint tool insert health prediction on vertical machining center (VMC)* **Name of the journal:** *Measurement Journal (Elsevier)* **Year of Publication:** *2021*	**12:00 – 1:00** **Article Discussion** **Title of the Research Paper :** *Notifying Type-2 Error and Segregating Undefined Conditions In Health Monitoring of Milling Cutter: A Statistical and Deep Learning Approach* **Name of the journal:** *Journal of Vibration Engineering & Technologies* **Year of Publication:** *2025*	**12:00 – 1:00** **Article Discussion** **Title of the Research Paper :** *Digital manufacturing of perovskite materials and solar cells.* **Name of the journal:** *Applied Energy (Elsevier)* **Year of Publication:** *2025*	**12:00 – 1:00** **Article Discussion** **Title of the Research Paper:** *Digital manufacturing and supply chain: creating benefits through operations research and artificial intelligence* **Name of the journal:** *Annals of Operations Research* **Year of Publication:** *2025*		**12:00 – 1:00** **Article Summary** *Title of Research Article: From Industry 4.0 Digital Manufacturing to Industry 5.0 Digital Society: A Roadmap Toward Human-Centric, Sustainable, and Resilient Production, Information Systems Frontier Journal, 2024. Two-Page Article Summary/per Team - (Team & Individual)*
1:00 – 2:00 Lunch Break					
2:00 – 4:30 Session 2 **Name of the Expert:** *Dr. Abhishek D. Patange* **Designation:** *Data Science & AI Specialist.* **Organization:** *ABB Global Industries and Services Pvt. Ltd., Bengaluru.* **Experience in Years:** *13 Years.* **Topic:** *Using Generative AI to Build Domain-Aware LLMs for Machine Tools Monitoring.*	**2:00 – 4:30 Session 4** **Name of the Expert:** *Anush Mishra* **Designation:** *Data Science and AI Specialist at ABB | UCMAS World Champion.* **Organization:** *ABB Global Industries and Services Pvt. Ltd., Bengaluru.* **Experience in Years:** *12 Years.* **Topic:** *Challenges and Future Trends in Digital Manufacturing and Robotics.*	**2:00 – 4:30 Session 6** **Name of the Expert:** *Mr. Gaurav Mapari.* **Designation**: Data & *Applied Scientist.* **Organization:** Pattern Technologies India Pvt. Ltd., *Pune* **Experience in Years:** *10 Yrs.* **Topic:** *Hybrid Model for Digital Twins.*	**2:00 – 4:30 Session 8** **Name of the Expert:** *Dr. N. K. Chougule.* **Designation:** *Professor.* **Organization:** *COEP Technological University, Pune.* **Experience in Years:** *26 Years.* **Topic:** *National Education Policy*	**2:00 – 4:30 Session 9** **Name of the Expert:** *Dr. Mahesh Jaybhaye.* **Designation:** *Associate Professor* **Organization:** *COEP Technological University, Pune* **Experience in Years:** *23 Years.* **Topic:** *Sustainable and Green Manufacturing through Digital Technologies*	**2:00 – 4:00** **MCQ & Reflection Journal** *Title of Article: IoT-based real-time online monitoring system for open-source FDM printers, Materials Today Proceedings, 2022.*
4:30 – 5:30 **Hands-on training /Lab:** *Robot Simulation and Offline Programming using RoboDK.*	**4:30 – 5:30** **Hands-on training /Lab:** *Industrial Automation Design and Simulation with Automation Studio.*	**4:30 – 5:30** **Hands-on training /Lab:** *Manufacturing Process Optimization using Witness Horizon.*	**4:30 – 5:30** **Hands-on training /Lab:** *CNC Programming & Machining using SSCNC.*	**4:30 – 5:30** **Hands-on training /Lab:** *VMC Machine Operation and Programming using SSCNC*	**4:00 – 5:00** **Valedictory Session**

Inaugural Session Report :

The AICTE-ATAL Sponsored Faculty Development Program began on 23rd June 2025 in OFFLINE mode at Vidya Pratishthan's Kamalnayan Bajaj Institute of Engineering & Technology (VPKBIET), Baramati. The inaugural ceremony, held from 9:00 to 9:30 AM, marked the formal opening of the one-week FDP. Dr. Sudhir B. Lande, Principal, VPKBIET, was the Chief Guest and chaired the session. Guests of Honour included the HOD of Mechanical Engineering, Dean Academics, and Dean Autonomy. Senior officials and enthusiastic participants from across the country also attended.

In the welcome address, Dr. S. M. Bhosle highlighted the vision of the ATAL Academy in enhancing faculty competencies and promoting innovation in teaching, with a focus on Industry 4.0. Dr. C. B. Nayak elaborated on AICTE's capacity-building initiatives. The Principal, Dr. Lande, delivered an inspiring keynote. The ceremony concluded with a Vote of Thanks by Dr. Bhosle, FDP Coordinator, who acknowledged the support of dignitaries, experts, participants, and staff.



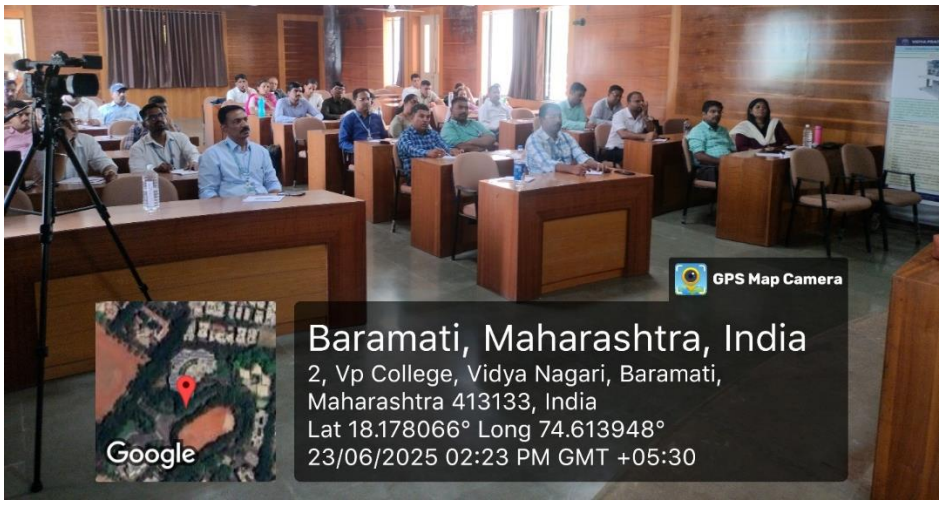
Photographs of 'Glimpses of Inaugural Session'

The List of Participants was:

Name	Email	Phone	Institute Name
Mr. DINESH NAYAN PANSANDE	dineshpansande123@gmail.com	9970148486	SVPM's COE Malegaon(Bk), Baramati
Dr. Milind Manikrao Darade	milind.darade04@gmail.com	9420033100	ABMSP's A.P. C.O.E.&R., Pune
Mr. Omkar Kamalakant Kulkarni	omkar.kulkarni@mitwpu.edu.in	9423533090	Dr. V Karad, MIT World Peace University
Miss Shreemanti Rokade	shreemanti.rokade@vpkbiet.org	9673766327	VPKBIET Baramati
Miss Snehal Balkrishna Walke	snehalwalke87@gmail.com	9881481387	VPKBIET, Baramati
Mr. Shrikant Chandrakant Mahadik	shrikantmahadik28@gmail.com	9850090011	VPKBIET Baramati
Mr. Digambar Machhindra Padulkar	digambar.padulkar@vpkbiet.org	9420172174	VPKBIET Baramati
Mrs. Joeeta Mukherjee Ghosh	joeeta.mukherjee.ghosh@gmail.com	7748038164	Dr. C.V. Raman University
Mr. Deepak Sambhaji Bhosale	deepak.bhosale@vpkbiet.org	9561940491	VPKBIET Baramati
Mr. Umesh Tukaram Jagadale	umesh.jagdale@vpkbiet.org	8600521804	VPKBIET, Baramati
Mrs. Varsha Sunil Surwase	varsha.surwase@vpkbiet.org	9423207383	Vpkbiet Baramati
Mr. Vishal B. Bhagwat	bhagwatvb@gmail.com	9096058379	VPKBIET Baramati
Mr. SUNIL MAHADEO PONDKULE	sunilpondkule@gmail.com	9921490139	SSPM'S SP College of Engg & Tech, Someshwarnagar
Mr. Dudhal Kenchappa Manageni	dudhalkm2016@gmail.com	9637837819	Dr.D.Y.Patil Institute Of Technology,Pimpri ,Pune.
Mr. SHIVAJI KISAN RASKAR	shivaji.raskar@vpkbiet.org	9960236241	VPKBIET, Baramati
Mr. Ganesh KONDHALKAR	ganeshkondhalkar@gmail.com	9822676607	ABMSP's A.P. C.O.E.&R., Pune
Dr. Dhananjay Panchagade	dhananjay.panchagade@fcrit.ac.in	9604909627	Fr. C. Rodrigues Institute of Technology, Vashi, Mumbai
Dr. RAVIRAJ RAMESH SORATE	drravirajsorate@gmail.com	9890518916	ABMSP's A.P. C.O.E.&R., Pune

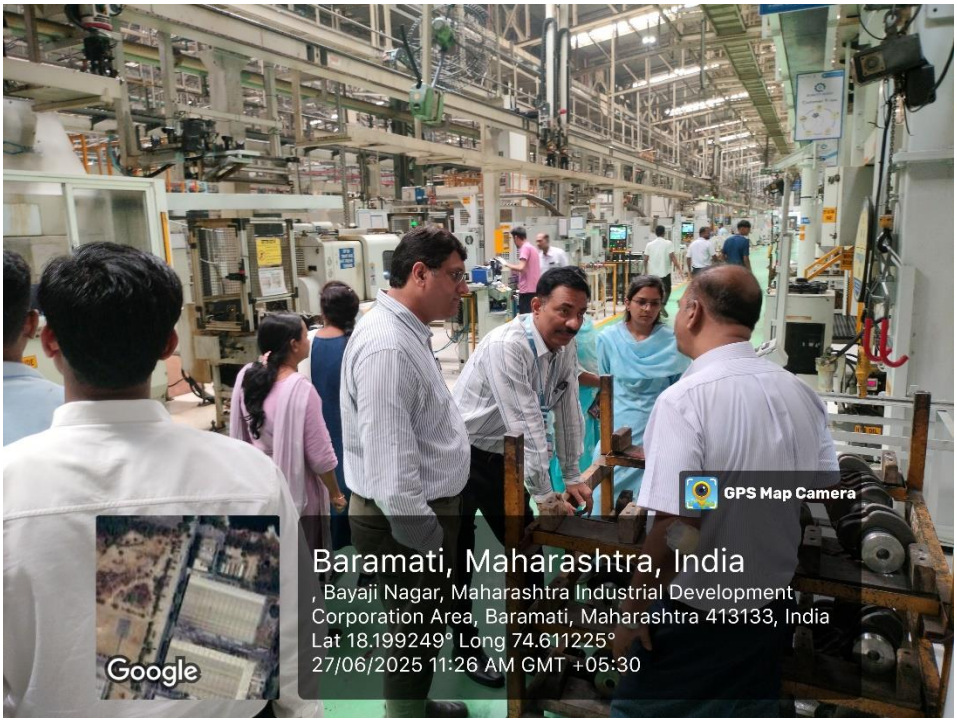
Mrs. Rajashree Laxman Ghule	rajashree.ghule@vpkbiet.org	9730637464	VPKBIET,BARAMATI
Mrs. Ashwini Suryawanshi	ashwini.suryawanshi@abmspcoerpune.org	9423777670	ABMSP's A.P. C.O.E.&R., Pune
Mr. DAYA SHANKAR	shankardaya37@yahoo.in	9599141560	COEP Technological University, Pune
Dr. Dr Sharad Gawade	sharadgawade.21@gmail.com	9423221655	SPCOE&T, Someshwar
Dr. Somnath Hanumant Kadhane	shkadhane@engg.svpm.org.in	9970060050	SVPM's COE, Malegaon (bk).
Mr. Pushkaraj Ramkrishna Admile	pushkrajadmile@gmail.com	9096423969	S.B.Patil COE, Indapur
Mr. MAHADEV BALASO KATKAR	mkmahadev385@gmail.com	9766753637	S.B.Patil COE, Indapur
Mr. Jaideep Purushottam Yadav	jpyadav@engg.svpm.org.in	9552511057	SVPM COE Malegaon BK
Mr. Rakesh Kumar	rky8892@gmail.com	9673174523	ABMSP's A.P. C.O.E.&R., Pune
Mr. ABHAY BABURAO SHELAR	abhayshelar@yahoo.com	9850543335	ABMSP's A.P. C.O.E.&R., Pune
Mr. Abhijeet Balasaheb Revade	abrcivil.svpm@gmail.com	9834790060	SVPMs COE Malegaon Bk, Baramati
Miss Chandgude Pooja Rohidas	prchandgude@engg.svpm.org.in	8275429040	SVPM's COE Malegaon(Bk.) Baramati
Mrs. Nilam Kunal Baravkar	nrbhosale@engg.svpm.org.in	9404030897	SVPM's COE Malegaon(Bk.) Baramati
Mr. INGALE PRAKASH DASHRATH	pdingale@engg.svpm.org.in	9822808958	SVPM's COE Malegaon(Bk.) Baramati
Dr. Mayur Dattatray Jagtap	mayurdjagtap@gmail.com	9730497308	S B Patil College of Engineering
Mr. YOGESHRAO YASHWANTRAO MORE	yogeshrao.more@modernncoe.edu.in	7767951115	PE Society's Modern College of Engineering, Pune
Mrs. Samidha Anand Jawade	samidha.jawade@mitwpu.edu.in	9764335772	MIT-WPU
Dr. ASHOK KUMAR GUPTA	profdrashokkumargupta@gmail.com	9425010901	Satpuda COE and Polytechnic, Balaghat - MP
Dr. Dinesh Namdeorao Washimkar	dineshwashimkar80@gmail.com	9503598026	Vishwakarma Institute of Technology Pune.

Mr. Yash Nitinchandra Jagtap	jagtapyash555@gmail.com	8668758550	VPKBIET Baramati
Mr. Kalel Navnath Agnu	kalelnavnath94@gmail.com	8600603625	COEP Technological University, Pune
Mr. Mandar Atul More	moremandar0017@gmail.com	9623631004	VPKBIET Baramati
Mr. Kiran Lalaso Bhoite	klbhoite@gmail.com	7385000654	PICT, Pune
Mr. Abhijeet Devidas Karne	abhikarne22@gmail.com	8329132208	PRIX CORPORATION
Mr. Gaikwad Mangesh Tanaji	gaikwad.mangesh366@gmail.com	9762703088	SSPM'S SP College of Engg & Tech, Someshwarnagar
Miss Pharande Sukanya Mukund	sukanyapharande@gmail.com	7517264366	SSPM'S SP College of Engg & Tech, Someshwarnagar
Mr. Swapnil Somnath Gajakas	swapnilgajakas6666@gmail.com	7219102606	VPKBIET'S BARAMATI
Mr. Nitin Gopinath Barge	ngbarge@engg.svpm.org.in	9767668399	SVPM's COE Malegaon(Bk.) Baramati
Dr. Vipin B. Gawande	vipin.gawande@vpkbiet.org	9890659696	VPKBIET Baramati
Mr. Pravin Vijay Dhandore	pravin.dhandore@vpkbiet.org	9730781451	VPKBIET, Baramati
Mr. Sandeep Vijay Raut	svrapcoer@gmail.com	9096154915	ABMSP's A.P. C.O.E.&R., Pune
Mr. Hafiz Minhajuddin Shaikh	hafiz.shaikh@vpkbiet.org	7350009048	VPKBIET Baramati



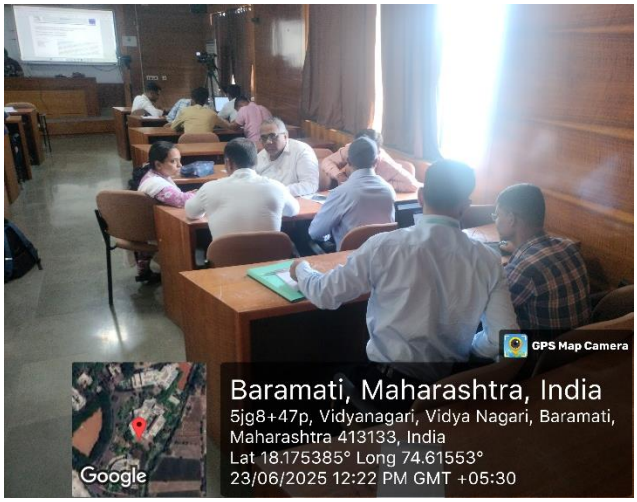
Industry Visit:

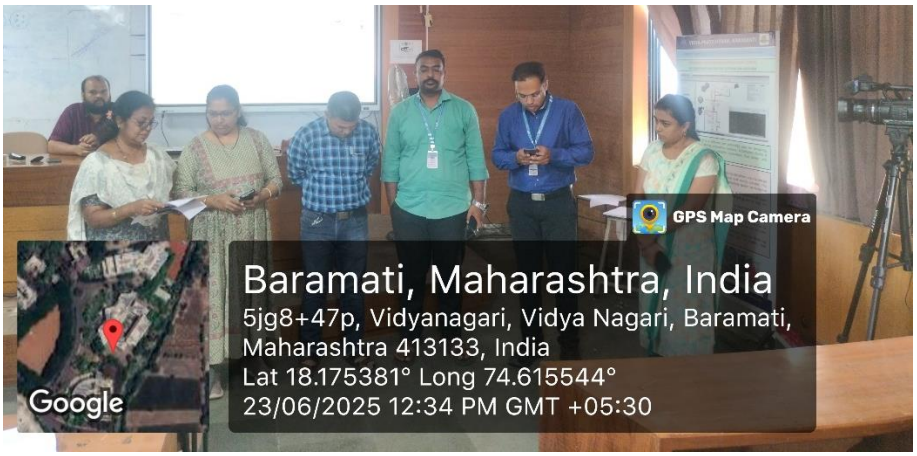
A key highlight of the FDP was an industrial visit to **Bharat Forge Ltd., Baramati**, where participants gained first-hand exposure to advanced manufacturing technologies and global best practices in forging and metal forming.



Research Engagement:

Participants engaged in **daily research paper discussions**, covering recent advancements in machine health monitoring, digital manufacturing, and AI applications. These sessions encouraged critical thinking and promoted scholarly dialogue among participants.



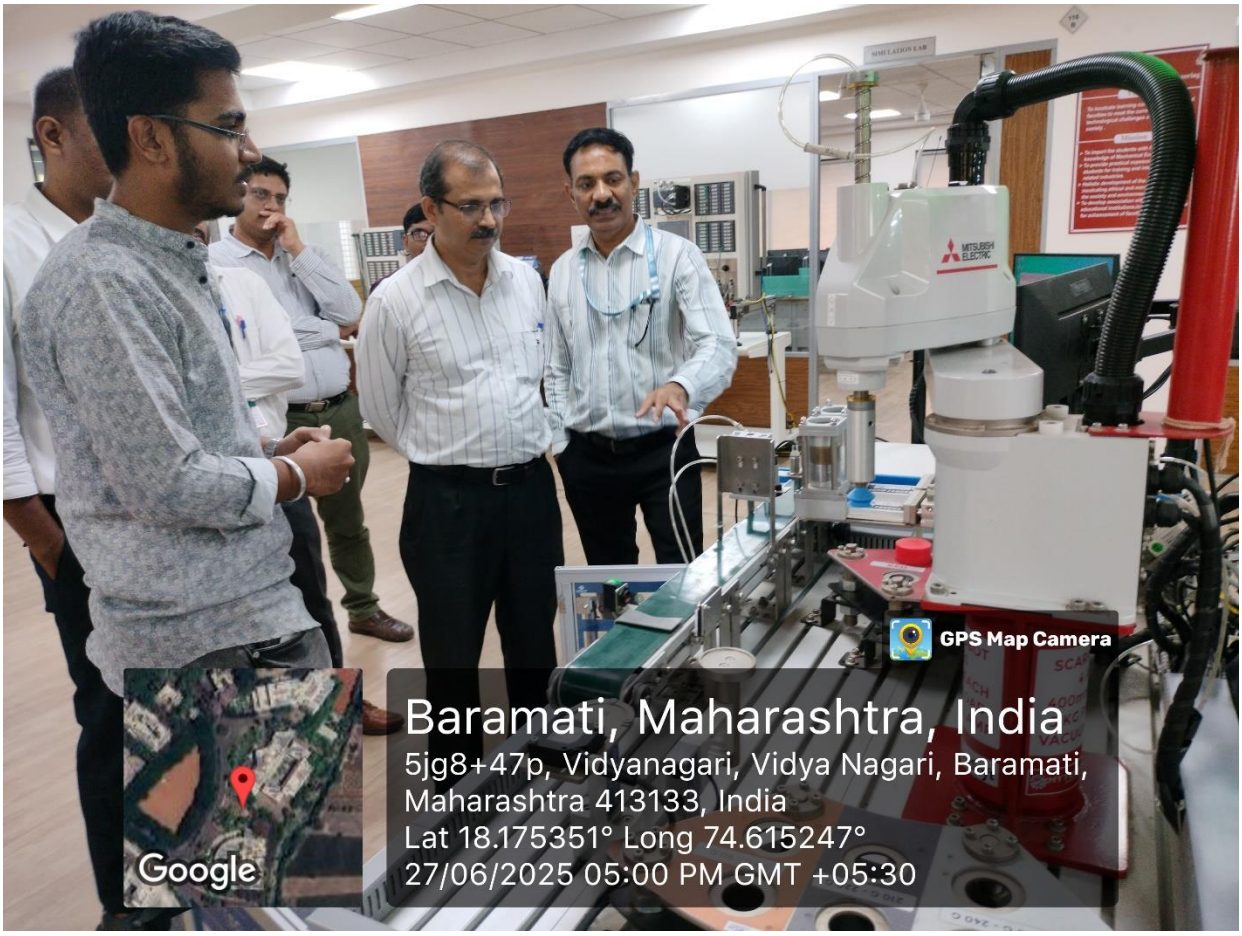


Hands-on Training:

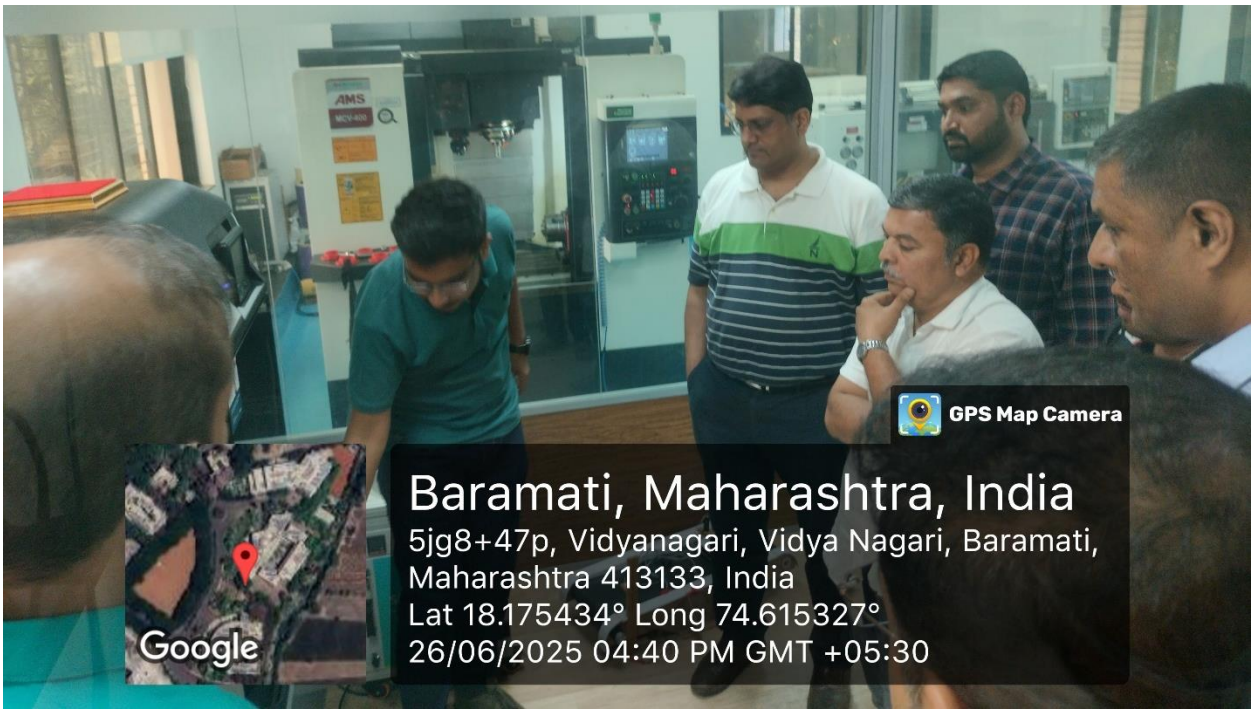
Each day concluded with **practical lab sessions** on:

- Robot simulation using RoboDK,
- Automation design with Automation Studio,
- Process optimization with Witness Horizon,
- CNC programming and VMC operation using SSCNC.

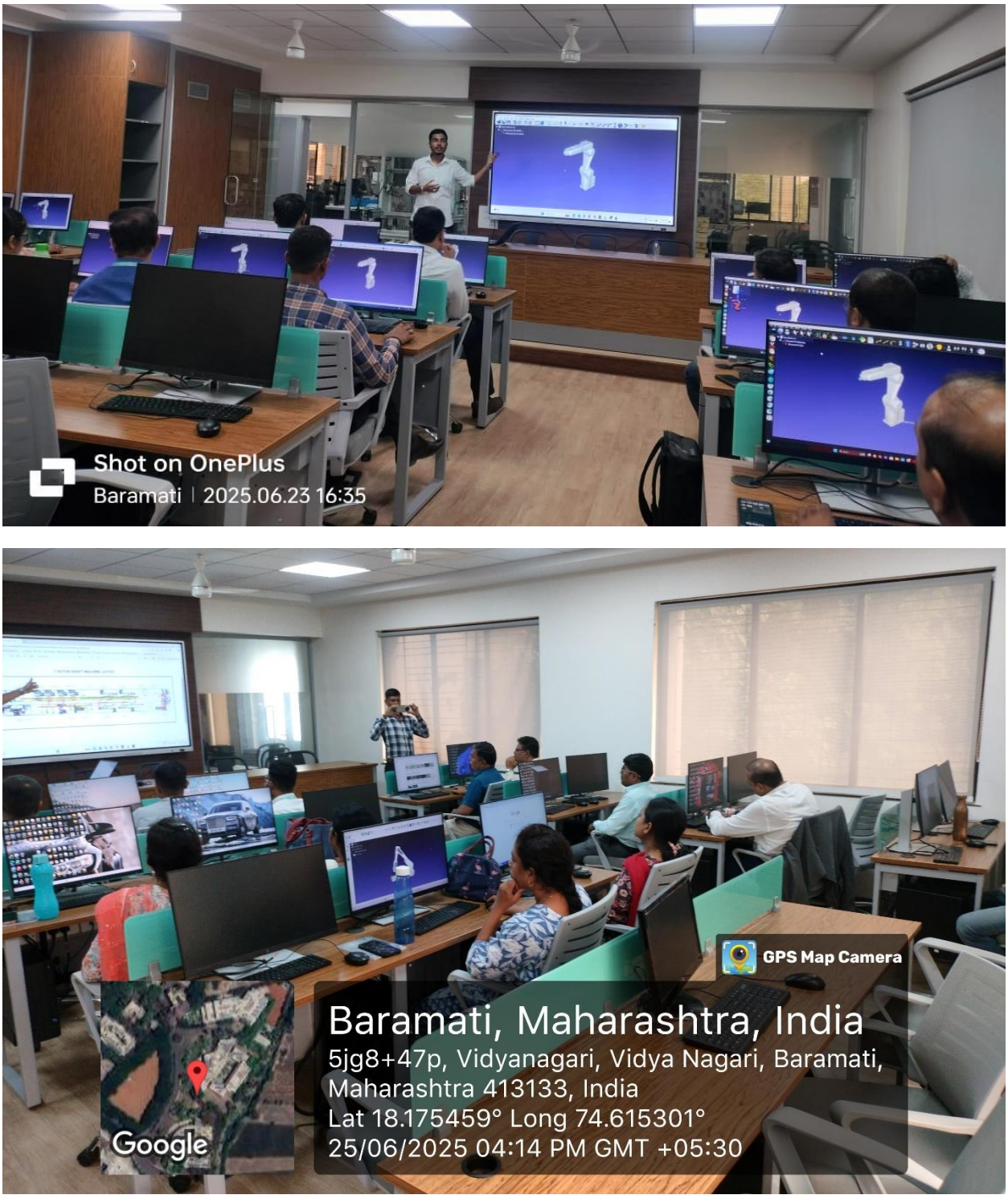
These sessions enhanced the participants' practical skills and pedagogical capabilities.



Glimpses of Hands-on Training Session



Glimpses of Hands-on Training Session



Glimpses of Hands-on Training Session

Assessment and Reflection:

An MCQ-based assessment and reflection journal activity was conducted on the final day, based on recent research articles, to evaluate the learning outcomes and encourage individual reflection.

Valedictory Session:

The program concluded on 28th June 2025 with a valedictory function, wherein participants shared their feedback and experiences. Certificates were awarded to participants who met the AICTE evaluation criteria.

Conclusion:

The FDP successfully achieved its objectives of bridging the gap between academic curricula and industry practices by equipping participants with essential skills and exposure in digital manufacturing and automation. The enthusiastic involvement of national-level experts, hands-on training, and a well-curated schedule made the FDP an enriching experience for all attendees.