



**AICTE IDEA Lab**

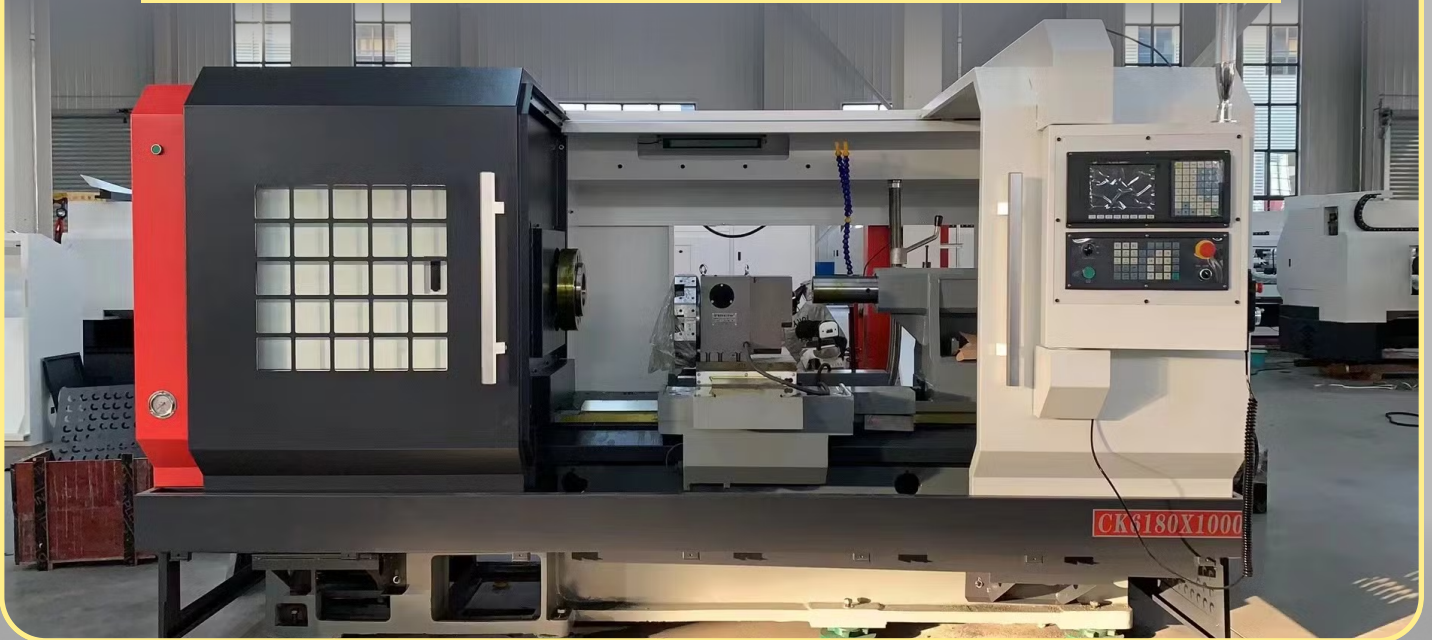


# Skilling Program for Students

on

## Integrated Manufacturing & "Smart IoT & Automation using ESP32: Sensors, Control & Data Logging" Program

6<sup>th</sup> April 2026 – 11<sup>th</sup> April 2026



**BHUJBAL**  
KNOWLEDGE CITY  
Mumbai Educational Trust

**Institute of  
Engineering**



Adgaon, Nashik-422003 | FOLLOW US   

# OBJECTIVES

- ❑ Train in CNC machining (router/lathe/laser): design, toolpaths, and hands-on operations.
- ❑ Master laser fundamentals, programming, cutting, and engraving on diverse materials.
- ❑ Implement ESP32 IoT: sensors (analog/digital), motor controls, PWM, and cloud data logging.
- ❑ Integrate skills via capstone project: design, fabricate, and evaluate using CNC, laser, robotics.

## ABOUT MET'S INSTITUTE OF ENGINEERING

Mumbai Education Trust's 'league of colleges' has contributed over 25,000 professionals to the Indian and Global business houses. In line with its commitment to provide world class education in India, MET created the state-of-the-art Bhujbal Knowledge City (BKC) at Nashik. MET-BKC at Nashik promises to be the answer to the everchanging needs of the business scenario. Situated at Adgaon, in Nashik the campus spans over 34 acres of lush green landscapes with over 4 lakh sq. ft. of campus floor space. The institute offers various under graduate programs in disciplines viz. AI & DS, Civil, Computer, Electronics and Telecommunication, Electrical, IT, Electronics & Computer and Mechanical Engineering. PG Course in ME (CADME), ME (COMP), MCA, Research center for Mechanical and Computer Engineering.



- ❑ MET is an NGO in Special Consultative Status with UN(ECOSOC).
- ❑ Enlightened interaction for urban-rural synergy.
- ❑ NPTEL Local Chapter and IIT- Spoken Tutorial.
- ❑ Exposure to the World Class Organization of activities like MET-Utsav, Conferences, Workshops.
- ❑ NBA Accreditation for five Departments & Accreditation by NAAC.

## ABOUT AICTE IDEA LAB

The MET's Institute of Engineering Bhujbal Knowledge City- AICTE IDEA Lab is a multidisciplinary innovation hub that promotes creativity, problem-solving, and entrepreneurial thinking among students. With a vision to nurture future-ready innovators and leaders, the lab offers a state-of-the-art platform for experimentation, prototyping, and solving real-world industrial challenges. The IDEA Lab houses advanced facilities including Additive Manufacturing, Electronic Product Design, IoT, Mechanical Fabrication, Design Thinking & Ideation, Electrical Systems, CAD with AR/VR & Simulation, and Robotics with AI-ML. By bringing diverse technologies and expert mentorship under one roof, the lab empowers students to transform innovative ideas into functional prototypes and technology-driven startups.

### CHIEF PATRON

**Mr. Pankaj Bhujbal**

Hon. Trustee MET's BKC, Nashik

**Mr. Sameer Bhujbal**

Hon. Trustee MET's BKC, Nashik

**Dr. Shefali Bhujbal**

Chief Administrator MET's BKC, Nashik

### PATRON

**Dr. V. P. Wani** Principal and Chief Mentor AICTE IDEA Lab, MET's BKC IOE, Nashik

### COORDINATOR

**Dr. S. D. Kalpande**

Coordinator AICTE IDEA Lab, MET's BKC IOE, Nashik

**Dr. Dhiraj D. Deshmukh**

Co-Coordinator AICTE IDEA Lab, MET's BKC IOE, Nashik

### CO-COORDINATOR

**Dr. Amit S. Patil** Tech Guru Mechanical Engineering, AICTE IDEA Lab, MET's BKC IOE, Nashik

# BASIC CRITERIA FOR NOMINATION

- Number of seats is restricted to 30 only.
- No Registration fee.
- Selection on First Come, First Served basis.
- On completion of the program E-certificate will be issued to participants.
- The students from approved institutions, Research scholars, PG Scholars can apply.

## HOW TO APPLY

**Skilling Program Dates: 6<sup>th</sup> – 11<sup>th</sup> April 2026**

### AICTE IDEA Lab

MET's Institute of Engineering, Adgaon, Nashik, 422003 Maharashtra

## REGISTRATION FORM

6 Days Skilling Program for Students on  
**Integrated Manufacturing & "Smart IoT & Automation using  
ESP32: Sensors, Control & Data Logging" Program**

6<sup>th</sup> – 11<sup>th</sup> April 2026

Name: \_\_\_\_\_

Department and Year: \_\_\_\_\_

Institution: \_\_\_\_\_

Address: \_\_\_\_\_

Phone (Mobile): \_\_\_\_\_

Email: \_\_\_\_\_

The given information is true to the best of my knowledge. I agree to abide by the rules and regulations of the program, if selected.

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

### No Objection Certificate

Mr./Ms./Dr \_\_\_\_\_ is a bonafide student of our Institution & the Institution has no objection in him/her applying for the skilling program on **Integrated Manufacturing & "Smart IoT & Automation using ESP32: Sensors, Control & Data Logging" Program**. If selected, he / she will be permitted to attend the program from 6 April 2026 - 11 April 2026.

Date: \_\_\_\_\_

Seal

Signature of HOD/Director

The soft copy of the duly filled Registration Form/NOC should be sent to [metaicteidealab\\_ioe@bkc.met.edu](mailto:metaicteidealab_ioe@bkc.met.edu)

# Integrated Manufacturing & "Smart IoT & Automation using ESP32: Sensors, Control & Data Logging" Program

(Hands-On Training in CNC Lathe-Router, Laser Programming & Smart IoT & Automation)

Day	Time	Session Title	Session Details (Hands-On Focus)
DAY 1	10:00 - 10:30 AM	Inauguration Welcome Address & Program Overview	Dr. V. P. Wani Designation: Principal and Chief, Mentor-AICTE IDEA Lab, Organization: MET BKC IOE Nasik
	10:30 AM - 11:30 AM	Introduction to Subtractive & Advanced Manufacturing	Overview of CNC Machining, Laser Cutting, and Robotics. Industry applications and safety protocols.
	11:45 AM - 1:30 PM	CNC Router: Design & Toolpath Generation	Introduction to CAD/CAM software. Creating 2D and 3D designs. Generating toolpaths (pocketing, profiling) for CNC Router.
	2:15 PM - 5:00 PM	Hands-On 1: CNC Router Operation	Machine setup, tool changing, work holding techniques, and machining a wooden/mild steel component.
DAY 2	10:00 AM - 11:30 AM	CNC Lathe: Principles of Turning	Understanding the lathe coordinate system, tooling (inserts, boring bars), and G-code basics for turning operations.
	11:45 AM - 1:30 PM	CAM for CNC Lathe	Creating turning programs for facing, turning, and threading operations using CAM software.
	2:15 PM - 5:00 PM	Hands-On 2: CNC Lathe Operation	Setting up workpieces, tool offset setting, and machining a precision cylindrical component.
DAY 3	10:00 AM - 11:30 AM	Laser Technology: Fundamentals & Safety	Principles of CO2 and Fiber lasers. Material interactions, safety interlocks, and maintenance.
	11:45 AM - 1:30 PM	Laser Programming & Design	Using laser software for rastering, vector cutting, and engraving. Designing for laser fabrication.
	2:15 PM - 5:00 PM	Hands-On 3: Laser Cutting & Engraving	Processing various materials (acrylic, wood, metal marking). Optimizing power, speed, and focus for different outcomes.
DAY 4	10:00 AM - 11:30 AM	Session 1: Introduction to ESP32 & Digital Control	Getting Started with ESP32 & Digital I/O Systems <ul style="list-style-type: none"> <li>ESP32 architecture &amp; features (Wi-Fi, Bluetooth)</li> <li>Arduino IDE setup for ESP32</li> <li>Digital input/output basics</li> <li>LED &amp; Push Button Interfacing</li> <li>Digital control logic implementation</li> </ul>
	11:45 AM - 1:30 PM	Session 2: Analog Sensors & Measurement	Analog Signal Processing using ESP32 (LM35 Sensor) <ul style="list-style-type: none"> <li>ADC in ESP32</li> <li>Analog vs digital signals</li> <li>LM35 temperature sensor interfacing</li> <li>Voltage to temperature conversion</li> <li>Serial Monitor output</li> </ul>
	2:15 PM - 5:00 PM	Session 3: Control Systems & Distance Measurement	Position & Distance Control using Sensors <ul style="list-style-type: none"> <li>PWM fundamentals</li> <li>Sensor-based control systems</li> <li>Potentiometer-based servo control</li> <li>Ultrasonic/IR sensor for distance measurement</li> </ul>
DAY 5	10:00 AM - 11:30 AM	Session 4: Motor Control Techniques	DC Motor Control using ESP32 & Driver Circuits <ul style="list-style-type: none"> <li>Transistor driver circuits</li> <li>PWM-based speed control</li> <li>DC motor speed control</li> <li>Potentiometer-based variation</li> </ul>
	11:45 AM - 1:30 PM	Session 5: Smart Data Logging & IoT	Cloud-Based Data Logging using ESP32 <ul style="list-style-type: none"> <li>Serial vs cloud communication</li> <li>Introduction to IoT platforms / Excel logging</li> <li>Sending sensor data to Excel / Cloud</li> <li>Real-time monitoring</li> </ul>
	2:15 PM - 5:00 PM	Session 6: Precision Control & Integration	Stepper Motor Control & System Integration <ul style="list-style-type: none"> <li>Stepper motor basics</li> <li>Direction &amp; speed control</li> <li>Stepper motor interfacing with ESP32</li> </ul>
DAY 6	10:00 AM - 12:30 PM	Capstone Project: Design to Finish	Participants work in teams to design, program, and fabricate a final product using CNC, Laser, and Robotic systems.
	12:30 PM - 2:00 PM	Assessment & Project Evaluation	Demonstration of capstone projects. Evaluation by mentors and faculty.
	2:00 PM - 3:30 PM	Valedictory & Certificate Distribution	Feedback session, distribution of E-certificates, and closing remarks by dignitaries.

Expert: Dr. Amit S. Patil

Expert: Prof. Yogesh S. More

Lunch Break 1:30 PM - 2:15 PM (for All Sessions)