



B.M.S. College of Engineering, Bengaluru -560019
Autonomous Institute, affiliated to VTU

1. Name of the lab:
 - a. SEM/XRD Lab
 - b. Abrasive Water Jet Cutting & EDM Lab
2. Department: Mechanical Engineering
3. Location of the lab: Mechanical Engineering Block
4. Faculty in charge:
Dr.M.Ramachandra, Dr S.Srivivas ramachandram.mech@bmsce.ac.in
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5. Associated with industry, if any: Nil
6. List of Equipments/facilities along with specifications and photographs + software with versions:

1. Scanning Electron Microscope



KEY SPECIFICATIONS *Model: Tescan Vega 3*

- Resolution: 3.0 nm at 30 kV • Magnification : Continuous from 4.5 X to 1,000,000 X
- Maximum Field of View: 0.08 μm • Accelerating Voltage: 200 V to 30 kV • Electron Gun : Tungsten Heated Cathode • Probe Current : 1 pA to 2 μA • Scanning speed : From 20 ns to 10 ms per pixel Adjustable in Steps or Continuously • Image Size : Up to 8,192 x 8,192 Pixels in 32-bit Quality.

2. X-ray diffraction analyzer



KEY SPECIFICATIONS

Model : X'Pert³ Powder

Scanning range (2θ) 1. 2θ range is - 40° to +220° 2. θ range is -15° to +181° 3. 2θ linearity over the complete range is equal or better than +/- 0.02 ° Minimum Step Size: Minimum step size 0.001° • Angular Reproducibility (2θ): Reproducibility of ±0.0001° with components mounted. • Resolution: 0.029 ° 2θ with Pixel @ 21.4° (low angle) 2θ • Goniometer Angular Linearity: Guaranteed 2θ linearity is ≤ 0.02° 2θ over the complete angular range. • X-Ray Generator: Capacity of 4 kW (60 kV and 100 mA), Current: 5 – 100 mA in steps of 1mA,

3. Abrasive Water Jet Cutting & EDM



Abrasive Water Jet Cutting

KEY SPECIFICATIONS

Model	OMAX MAXIEM 1515
X-Y cutting travel	1575 x 1575 mm
Z- Axis travel	150 mm
Accuracy	+ 0.025 mm
Repeatability	0.051 mm
Cutting Head Tilt +/- 60 degrees	



Wire Cut EDM

KEY SPECIFICATIONS

Model	DK7732
X-Y cutting travel	415 x 635 mm
Max. Thickness	500 mm
Accuracy	+ 0.01 mm
Surface Finish	1.25 μ to 1.75 μ

Major Achievements till date:

- Started new Post-graduation program, M.Tech in Manufacturing science and Engineering under Center of excellence. Intake -24
- 32 PG-students of M.Tech, Manufacturing science and Engineering are awarded Teaching assistantships under COE
- All PG students till date are doing their M.Tech project work in the area of Advanced Materials.
- 4-Full time and 7-Part time research scholars are awarded PhD under Center of excellence in the area of Advanced Materials.
- 5-Expert lectures
- 5-Workshops
- 4-Faculty development programs and
- 1-International conference on Advanced Materials and Applications (ICAMA2016)

7. Photographs

- Front view / Overall view of the lab



- Demonstrating the activities inside the lab



9. Any other info about the lab

- International conference on Advanced Materials and Applications (ICAMA2016)



- One Week Technology Transfer & Faculty Development Program On NONTRADITIONAL MACHINING AND MATERIALS CHARACTERIZATION (NTMMC)



- One Week Technology Transfer & Faculty Development Program on “Conducting Polymer Composites, Synthesis and Characterization”



- One week Faculty Development Program on Materials in Engineering and Technology (MET)
- One Week Faculty Development Program on “Recent Advances in Chemistry of Materials for Engineering Applications”(RACMEA-2016)
- Three day workshop on “Fabrication, Testing and Qualification of Polymer Composites”
- Technology Transfer/Societal Initiatives
 - ✓ **Technology Transfer Program on “NONTRADITIONAL MACHINING AND MATERIAL CHARACTERIZATION”**
 - ✓ To create awareness about the present status of Unconventional machining and material characterization
 - ✓ To highlight the research being carried out and promote further research in these areas
 - ✓ To educate village students of Polytechnic and B.Sc. in the field of characterization and machining
 - ✓ **Village: Somanahalli, Participants: Polytechnic Students of APS Polytechnic**
 - ✓



- **Technology Transfer: Enabling Workmanship in Electrical Wiring using modern materials**
 - To empower individuals with vocational skills in electrical wiring.
 - To apprise about the career paths in this domain.
 - To update on the availability of advanced materials for wiring and their functionalities
 - Village: Byrashettahalli
 - Participants: 10th pass students of Govt. Higher Primary School, Byrashettahalli. Nelamangala Taluk.

