

LIMITED MANUFACTURING MECHANICAL

Department of Production Technology

- ◆ The Limited Manufacturing Facility at MIT was established under UGC-UPE for the manufacture of Bio-Medical Devices. The objective of the project is to design, fabricate develop and commercialize the various models of Automated Anti-Biogramoscope devices. Manufacturing of Automated Anti-biogramoscope involves several processes like machining, manufacturing, material handling integrated together.
- ◆ The facility consists of Advance CAD Lab for Designing & Analysis, Advance Machining Facility, Metal Forming and Calibration & Testing lab. Each facility consists of State of the art software and machineries.
- ◆ Advance CAD lab uses CREO, CATIA, ANSYS, ADAMS, DELMIA Software for Design and Analysis for components for the Automated Anti-biogram Device.
- ◆ Advance Machining Facility & Metal Forming Lab comprises of CNC 5-Axis Machining Centre, CNC Lathe, CNC Power Press Brake, CNC Hydraulic Press and Thread Rolling Machine. This facility is capable of machining & producing precision component with complicated shapes. A Gantry system is also used in material handling for CNC Machines. A 6-Axis Robot is in operation for Welding and Material Handling. A SLS 3D printer is installed that can manufacture precise components through Designs generated from Reverse Engineering.
- ◆ Calibration & Testing lab utilizes CNC-CMM, 3D Laser Scanner and Non-Contact Surface Roughness Testing Instruments. These instruments are needed for inspecting micron level dimensions. This facility carries out the task of inspection and ensures quality control of the final product.
- ◆ Other equipment in the Manufacturing facility includes High Temperature Furnace, Chemical Vapour Deposition Unit, TIG & MIG Welding units etc.,

6 Axis Robot With Software and Controller (lightweight Torque Compliant Robotic Arm)



The six-axis robot is a lightweight, 6 DOF manipulator with higher payload capacity which can be used for pick & place and liquid handling applications with appropriate software and accessories.

The robot can also be used to automate applications throughout the production line to save time and money. A detailed forward - inverse kinematics and dynamics study will be helpful for the researchers to understand the motion planning of the automated system.

6 Axis Robot With Software and Controller (ABB Industrial Robot)

The six-axis robot is a industrial, 6 DOF manipulator with higher payload capacity which can be used for pick & place and welding applications with appropriate software and accessories.

The robot can also be used to automate applications throughout the production line to save time and money.

Automated MIG welding can be performed with the above robot. Simple machining applications can also be performed with appropriate tools



CNC Power Press Brake

For forming the sheet metals to make the outer frame, inner stacks, of the Antibioqram device.

All sheet metals up to 4mm and plates up to 12mm can be bent into desired shape and angle

Tig Welding Machine



This TIG Welding machine is used to weld Mild steel, Stainless steel, Aluminium, Magnesium, Brass and Copper. All the structures fabricated for the Antibioqram device are welded using the TIG Welding Unit

Non-contact Surface Roughness Tester

The machine is a 3D non-contact type, Ultra-high precision machine which can analyze roughness, form, step height, thick films, stitching, etc. For Testing the surface roughness/Smoothness of the various machined Components of the Bactibiogramoscope.



Ultrasonic Drilling Machine



Ultrasonic Drilling Machine is used for drilling of materials by high-frequency ultrasonic acoustic vibrations locally applied to work pieces. It is commonly used for drilling brittle materials like ceramics, glass, etc.

End Effector



The sense of touch provides a rich variety of information about the hardness, softness, malleability, or rigidity of these objects, and helps us identify the effort needed to manipulate them.

The haptic device provides force feedback and allows you to enhance scientific or medical simulations, increase productivity with interactive training, and easily manoeuvre mechanical components to produce higher quality designs.

Ultrasonic Welding Machine

Ultrasonic machines are used to produce deep holes with a high level of precision. Using an acidic solution, such as hydrofluoric acid, machining characteristics such as material removal rate and surface quality can be improved greatly compared to pure ultrasonic machining. Ultrasonic machining is precise enough to be used in the creation of microelectromechanical system components such as micro-structured glass wafers.



CNC Turning Centre



Turning is a machining process in which a cutting tool, typically a non-rotary tool bit, describes a helix tool path by moving more or less linearly while the work piece rotates.