AICTE IDEALab

Idea Development, Evaluation & Application

IDEA202000244

SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTION)

Equipments With Specifications

ABOUT THE INSTITUTION

Sri Manakula Vinayagar Engineering College was established in the year 1999, which is located in a sprawling green campus of 125 acres, possessing all the state-of-the art infrastructure facilities with 23 years of academic excellence. UGC has granted Autonomous Status to the institution on September 2019 and it was approved by Pondicherry Central University. The standard of quality imparted by the institution is ascertained by the institution level accreditation from NAAC with "A" grade and all undergraduate and MBA programmes are accredited by NBA, New Delhi. In addition to its glory, IT Giant Tata Consultancy Services (TCS) also accredited the institution.

With the facilitation of the learning hub, the students of the institution have accomplished 118 University Gold Medals and 703 top ten-university ranks of Pondicherry University since 2003. Because of effective placement initiatives, 90% of students are placed in reputed MNCs for the past decade and more than 1015 students are placed in the academic year 2020. The institution is offering 14 Under Graduate, 8 Post Graduate and 11 Doctoral Programmes. To provide skill-based learning, the institution has established 17 Centre of Excellence to offer more than 90+ skill-oriented associate level International Certification Courses which are highly demandable and expectations of industries.

ACCREDITATIONS

NAAC Accreditation with "A" grade

NBA Accreditation

TCS Accreditation with "B" grade

SMVEC AICTE IDEA LAB

AICTE has launched a scheme to establish AICTE-IDEA (Idea Development, Evaluation & Application) Labs in its approved institutions to encourage students to apply Science, Technology, Engineering, and Mathematics (STEM) fundamentals for enhancing hands-on experience and learning by doing. The All-India Council for Technical Education (AICTE) announced the names of 49 institutions that were selected for establishing AICTE IDEA (Idea Development, Evaluation & Application) Lab in their campus. IDEA Labs are co-funded by AICTE and industry/institution under the Scheme.

Under this scheme, a grant of Rs. 1.23 Crore is sanctioned, of which Sri Manakula Vinayagar Engineering College received a grant of Rs. 47.7 lakhs from AICTE, and the remaining amount of Rs. 75.30 lakhs are contributed from the management to establish SMVEC AICTE-IDEA Lab. This IDEA Lab is a common facility of the institution that will make engineering graduates more imaginative and creative, besides providing training in 21st-century skills such as critical thinking, problem-solving, research, collaboration, communication, lifelong learning, etc. IDEA Lab can empower the students and faculty to “engage, explore, experience, express and excel”, addressing the need of new age learning. IDEA Lab would serve as an infrastructure for faculty to take up and promote multidisciplinary education and research. Accordingly, faculty would be encouraged to get trained in this Lab and strive for creating problems/ projects/ internships in their own subjects/ disciplines and mentor the students.

OBJECTIVE

- All facilities under one roof for the conversion of ideas into a prototype.
- Training in the 21st century skills- critical thinking, problem-solving, collaboration etc.
- Making engineering students more curious, imaginative and creative; engineering education more engaging.
- IDEA lab will be centered around activities and events to promote multidisciplinary education and research.

INFRASTRUCTURE FACILTIES

ELECTRONIC PRODUCT DESIGN LAB

Product Design Lab section is a dedicated space designed to foster innovation, practical learning, and research in electronics and embedded systems. This section provides student, researchers, and educators with the tools and environment needed to develop, test, and prototype electronic systems, bridging the gap between theoretical concepts and real-world applications.

***Equipments*:**

- *Basic Instruments:* Includes oscilloscopes, function generators, multimeters, and power supplies.
- *Advanced Instruments:* Features spectrum analyzers, logic analyzers, network analyzers, and signal generators.
- *Prototyping Tools:* Soldering and rework stations, and CNC machines for creating and testing PCB.

Components and Accessories:
A comprehensive inventory of passive and active components, connectors, cables, breadboards, and PCBs.

Software Tools:

- *Design and Simulation*: Tools like SPICE simulators, MATLAB, Simulink, and LabVIEW for system design and analysis.
- PCB Design: Altium Designer, KiCad, and Eagle for creating circuit boards.

ADDITIVE MANUFACTURING LAB

An Additive Manufacturing Lab is a facility equipped for the production of components or products using additive manufacturing (AM) technologies, often referred to as 3D printing. AM labs often aim to advance the understanding and capabilities of additive manufacturing technologies. This may involve fundamental research into new materials, processes, and techniques, as well as applied research to solve specific challenges in various industries. AM labs serve as educational hubs where students, researchers, and industry professionals can learn about additive manufacturing through hands-on experience. : One of the primary applications of AM is rapid prototyping and iterative design. AM labs provide facilities for designers and engineers to quickly iterate through design concepts, produce prototypes, and test functional prototypes for form, fit, and function.

Equipments

FDM 3D Printer-Ender 3 V2, Thunder Pro, Creatbot | SLA 3D Printer | SLA Curing Machine | 3D Scanner

Softwares Used

Modeling software

- *Tinker Cad*
- *Onshape*
- *Fusion 360*
- *CATIA*
- *SOLID Works*

Slicing software

- Ultimaker Cura
- Simplify 3D
- Creatware
- PrusaSlicer

3D Scanning software

- Revo Scan
- Revo Studio

INTERNET OF THINGS LABORATORY

An IoT (Internet of Things) laboratory is a space within Idea Lab dedicated to researching, developing, and testing IoT devices and applications. It provides a unique opportunity to explore the possibilities of IoT technology and to develop new and innovative solutions that can make a positive impact on society.

MECHANICAL SECTION

Laser cutting is a highly precise manufacturing technology that uses a focused laser beam to cut materials with extreme accuracy. Create complex shapes and designs quickly and easily by using Inkscape software, it has become an essential tool for many industries and creative professionals. The process involves directing a high- powered laser beam onto the material, which melts, burns, or vaporizes the material, leaving a clean and precisecut.

Laser engraving and cutting Machine for, Non-Metal such as: Acrylic, Soft wood, Paper, Cardboard, Cloth, Leather, Plastic, PVC, Rubber, Ceramic, MDF Plywood, Flat Glass, ABS Sheet (Dual Color)

Software Used

- Inkscape
- Coreldraw
- Photoshop

CNC WOOD ROUTER

A CNC wood router lab is a specialized facility equipped with CNC (Computer Numerical Control) wood router machines for educational or research purposes. CNC wood routers can perform a wide range of tasks including cutting, carving, engraving, and shaping wood.

One of the primary advantages of CNC wood routers is their ability to produce highly precise cuts and intricate designs. This precision allows for intricate detailing and complex shapes that would be challenging to achieve manually. The lab should provide dedicated workspaces where students or researchers can set up their projects, prepare materials, and operate the CNC machines under supervision. CNC wood router labs provide hands-on learning opportunities for individuals interested in woodworking, manufacturing, engineering, or related fields.

Software

- Art CAM
- Edding CNC

SEMINAR HALL

AICTE-IDEA (Idea Development, Evaluation & Application) Lab “encouraging students for application of science, technologies, engineering and mathematics (STEM) fundamentals towards enhanced hands-on experience, learning by doing and product visualization”

Monitoring Process

The IDEA lab process is monitoring as follows

- 15-20 parameters
- Parameters: Input (Users / Equipment added / Investment), Process (Events / Utilization), Output (Prototypes / Patents / Revenue), Recognition (Award / Mentorship)
- Performance Monitoring by IDEA lab
- Monthly points, Cumulative Points
- Composite score-based performance on the Lead board of IDEANET website
- Light but Tight approach
  - Utilization by Students of Host Institute
  - Utilization by Students of Other Institute
  - Utilization by Faculty Members of Host Institute
  - Utilization by Faculty Members of Other Institute
  - Utilization by Alumni of Host Institute
  - Utilization by School Learners
  - Utilization by Entrepreneur / Start-up
  - Utilization by Industry
  - Patent Registered or Granted by utilization of AICTE – IDEA Lab
  - Awards received by utilization of AICTE – IDEA Lab
  - Projects completed by using AICTE – IDEA Lab
  - Handholding about AICTE – IDEA Lab in Network
  - Operational Hours of the AICTE – IDEA Lab (Every Day)
  - Investment in AICTE – IDEA Lab

By monitoring these aspects effectively, AICTE ensures that the IDEA Labs are functioning optimally, providing valuable learning experiences for students, and contributing to the overall goal of fostering innovation and creativity in technical education.

FACILITIES CREATED

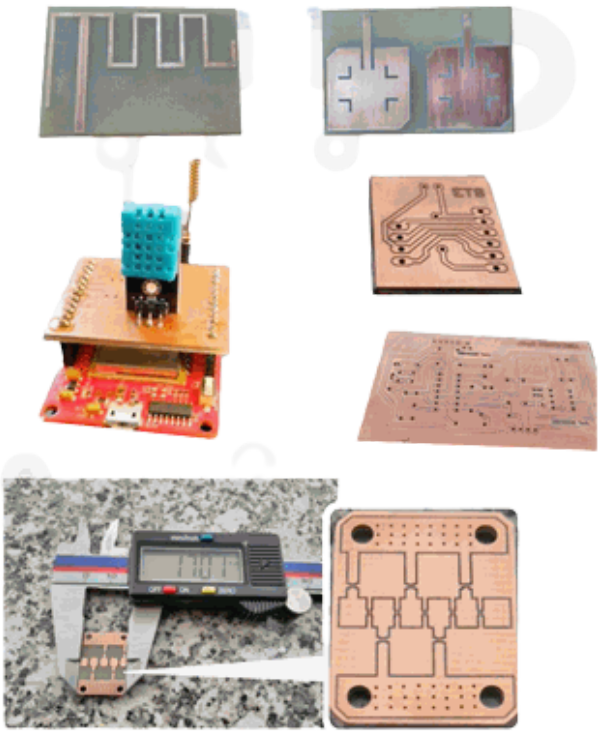
CO2 TIL6090 LASER ENGRAVING MACHINE

Laser Engraving Machines are specifically designed for cutting, engraving non-metals such as Lather, acrylic, Paper, softwood, rubber, plastic ,cloth, etc, and can engrave some metalic material like anodised or powder coated metal sheet.

Model Number/Name	TIL6090
Laser Type	CO2
Automation Grade	Automatic
Cooling Mode	Industrial Chiller
Industrial Chiller	Max 1-300 mm/s
Cutting Thickness	0.1-25mm

PCBMATE® - 300W

The PCBMATE 300 watts Prototype & Antenna fabrication machine is used to make a prototype PCB board. We can make Engraving, Hatching, Milling, Drilling, and Cutting. In this machine tools are changed by manual only. It's available in two various communication modes (Parallel port / USB mode). This machine is controlled by the CNC controller with Mach3 CNC software. Its working area is 220x330x120 mm and its resolution is 3.125 Micrometers.



WOOD ROUTER

CNC routers are machines used to cut many types of materials, such as wood, plastic, aluminum, and high-density foam.

X-Y Axis Working Area	1300 x 2500 mm
Model	ET1325
Job Material	Wood, Acrylic, Alumnium
Driven Motor	Servo Motor

POWER TOOLS - BOSH

SOLDERING STATION

3 D PRINTER

Print Technology	Fused Deposition Modeling
Number of Nozzles	Double
Filament Diameter	1.75 mm
Filament Compatibility	PLA, ABS, Carbon Fiber, Wood, Nylon, PC, PETG, HIPS, PP, Flexible, TPU, PVA, PEEK, etc.
Nozzle Diameter	0.4mm (0.3 0.5 0.6 0.8 1.0mm)
Print File Type	STL, OBJ, AMF, Gcode

AEROPRO AIRLESS PAINT SPRAYER

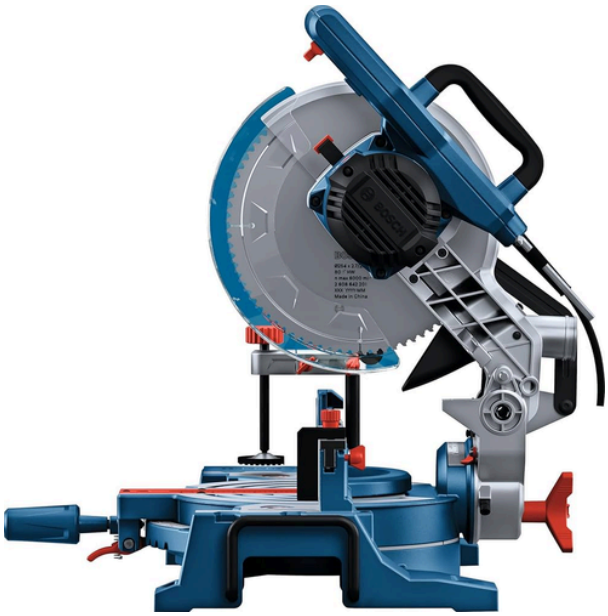
Description

- Aeropro 900 W Paint Sprayer Machine
- 3000 Psi Max Pressure
- 15 m Hose Pipe

BOSCH MILTER SAW MACHINE

Description

- Surface Recommendation : Wood
- Power Source : Corded Electric
- Included Components
- 1 Mitre Saw
- Product Dimensions
  57.5L x 40W x 41H Centimeters
- Item Weight : 11.26 Kilograms
- Speed : 5000 RPM
- Blade Length : 57.5 Centimetres
- Cutting Angle : 45 Degree



BLACK HAWK CLAMPING KIT 16-12MM

MAF PRO BAND SAW

MAF PRO TABLE SAW

Cutting Blade Size	10 Inch
No Load Speed	4200rpm
Brand	MAF India
Model Name/Number	M1YD-ZB-2541
Bevel Angle Range	0-45 Degree
Dust Collection	Yes
Frequency	50Hz
Voltage	110 V,220 V
Power Input	1800W
Country of Origin	Made in India
Extractor Socket	35mm

MSI AIR COMPRESSOR 2HP 50L

Tank Capacity	50 L
Pressure	8 Bar
Type of Product	Lubricated Air Compresssor
Power	2 HP

BULLWARK PIPE VICE SELF-LOCKING HINGED 2"

REX BENCH GRINDER 1/2 HP SINGLE PHASE

3M NOSE MASK 6200

BOSCH CIRCULAR SAW MACHINE 7 GKS140

BULLWARK C-CLAMP-DROP FORGED 6"CARBON STEEL POWDER

BOSCH DIE GRINDER

BOSCH SANDER ELECTRIC 5", 250WATTS

FORE IMPACT WRENCH PNEUMATIC 1/2"

CROS CABLE CUTTER

BOSH DRILLING MACHINE GSB 13RE KIT

BOSCH SANDER ELECTRIC 5", 250WATTS

BOSH ORBITAL SANDER GSS2300

BOSH IMPACT DRILL ELECTRIC 10 CAPACITY 450 WATTS

BOSH JIG SAW MACHINE GST650

BOSH MARBLE CUTTER - ELECTRIC GDC120

X DISTANCE METER 40 MTR

MTECH CLAMP METER AC 1000 AC AMPS 750 VOLTS

BOSH BLOWER ELECTRIC 620 WATTS

BOSCH ANGLE GRINDER ELECTRIC 4"

STANLEY HOT AIRGUN ELECTRIC 2000 W

STAR POP RIVETER BOLT CUTTER TYPE, HEAVY DUTY

HTC INFRARED THERMOMETER 50 TO 550 DEGREE

RESIN PRINTER AND ENDER3V2

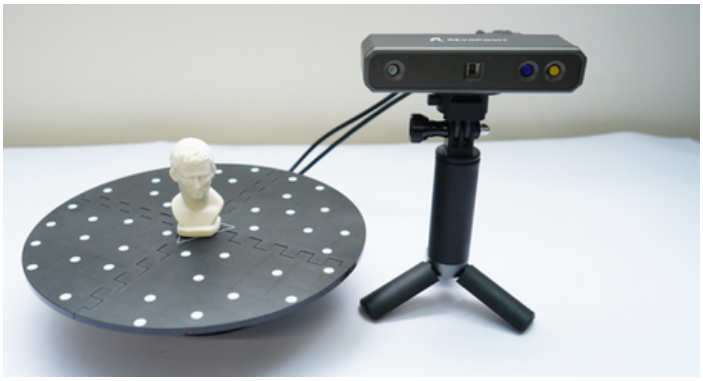
SUBLIMATION, VINYL PRINTING MACHINE

SUBLIMATION PRINTER

echnology	Color
Connector Type	Wi-Fi
Model Name	SureColor SC F130
Sheet Size	A4 Millimeters
Colour	Color
Printer Output	Colour

BENCH TOP MULTIMETER

REVOPOINT MINI 3D SCANNER



DUAL REGULATED POWER SUPPLY

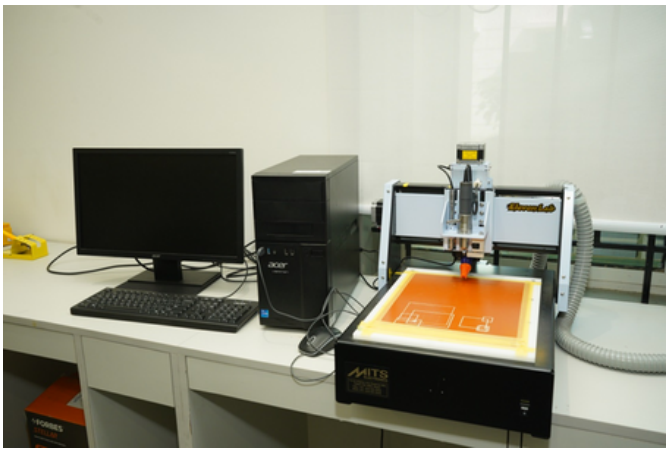
DIGITAL STORAGE OSCILLOSCOPE 100MHZ

MULTI OUTPUT POWER SUPPLY

MULTI OUTPUT POWER SUPPLY

PCB DRILLING MACHINE WITH STAND

PCB AND ANTENNA FABRICATION MACHINE



VINYL PRINTING AND CUTTING MACHINE

Printing Technology		Drop-on-demand, Piezo electric inkjet
Print Heads		Micro Piezo Print Heads
No. of Print Heads		2
Media	Width	1850 mm
	Thickness	Maximum 3.0 mm with liner
	Roll Outer Diameter	Maximum 250mm
	Types	SAV, PVC Banner, Backlit Film, Window Film, Fabric (Eco-Solvent Base)
Printing Width		Maximum 1800mm
Inks	Types	Eco-solvent Ink
	Color	4 Colors (CMYK)

Declaration

This is to certify that the equipment and specifications detailed in the document titled "Major Equipment Specifications for SMVEC AICTE IDEA Lab" have been prepared with due diligence and are in accordance with the requirements and objectives of the AICTE IDEA Lab project.
We confirm that the information provided in the document is accurate and complete to the best of our knowledge and has been compiled by the authorized representatives of Sri Manakula Vinayagar Engineering College (SMVEC).

All highlighted major equipment items have been identified and proposed to support the intended academic, research, and development activities of the AICTE IDEA Lab, ensuring adherence to the guidelines prescribed by AICTE.

We declare that the funds allocated for this project will be utilized judiciously, strictly for the purchase and installation of the specified equipment and to support the lab's operations as per the project's objectives.

We undertake full responsibility for ensuring compliance with AICTE norms and for the proper implementation of this project.

Dr.V.S.K. Venkatachalapathy
Director cum Principal
Chief Mentor - SMVEC AICTE IDEA LAB

Dr. K. Velmurugan
Dean Research
Coordinator - SMVEC AICTE IDEA LAB

Dr. P. Raja
Professor and Head / ECE
Co- Coordinator - SMVEC AICTE IDEA LAB

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