

**SCHOOL OF MECHANICAL ENGINEERING**



**ADDITIONAL LABORATORY FACILITIES**

**NOIDA INSTITUTE OF ENGINEERING &  
TECHNOLOGY  
GREATER NOIDA**

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## ADDITIONAL LABORATORY FACILITIES

### 1. FSP/FSAP/FSW

**Setup Name-** Friction stir welding.

**Setup established by-** Mr. Sanjay Kumar Maurya

**Objective-** Student will learn advance welding technique. Students as well as faculties can do their research work or project on this machine.

**Purpose-** To weld Aluminum, and other Aluminum based composite materials.

**Location-** Workshop lab, Ground floor B-Block

#### **Machine Specification-**

SN	Particular	Description
1	Motor	1 HP, 3 $\Phi$ Induction Motor, 1440 RPM
2	Table length	1016mm
3	Table width	241.3mm
4	Travel in X and Y Direction	609.6mm&88.9mm

**Outcome-** Several research papers have been published by Mr. Sanjay Maurya, Mr. Rakesh Kumar Singh and some students of UG and PG.



Figure 1 Vertical Milling Machine

## 2. MICROWAVE WELDING

**Setup Name-** Microwave welding

**Location -** Workshop , Ground floor, B-Block

**Setup established by-** Mr. Prateek Gupta

**Objective-** Student will learn Unconventional welding technique. Students as well as faculties can do their research work or project on this setup.

**Purpose -** To weld Steel or other composite materials.

**Setup specification-**

SN		
1	Microwave capacity	32L
2	Cavity Type	Stainless Steel
3	Control Type	Tactile/Dial
4	Dimensions (W x D x H) (mm)	527 x 480 x 392
5	Power Consumption( watt)	2350

**Outcome-** Five research papers have been published by till now by Mr. Prateek Gupta and some students of final year.



### 3. SINTERING FURNACE

**Setup Name-**Sintering Furnace.

**Location-** Workshop lab, Ground floor B-Block

**Objective-** Student will learn advance manufacturing technique. Students as well as faculties can do their research work or project on this machine.

**Purpose-** To use Steel or other composite materials.

SN	Items	Types
1	Tube	Abrostate Tub
2	Chamber size	50 diameter, 300 mm heating Zone
3	Total length	100 mm
4	Atmosphere	With Flange both side for vacuum or inert gas Atmosphere
5	Working Temp	1500 C
6	Maximum Temp	1600 C
7	Thermocouple	B type
8	Supply	230 V AC
9	Control panel	Control panel with PID programmable controller

**Outcome-** Currently faculties and students are doing their research work on this machine.



## 4. COMPUTERIZED TENSOMETER

**Lab Name** - Material science and testing

**Setup Name**- Computerized Tensometer

**Objective** -To check different material properties.

**Purpose**- To conduct tensile test.

**Location** - Material science and testing lab, Ground floor B-Block, Room No-021

### Machine Specification-

SN	Particular	Description
1	Model	PC-2000
2	Max load capacity	1900KN
3	Software	PC-2000
4	Computer RAM	3GB,500GB Hard Drive

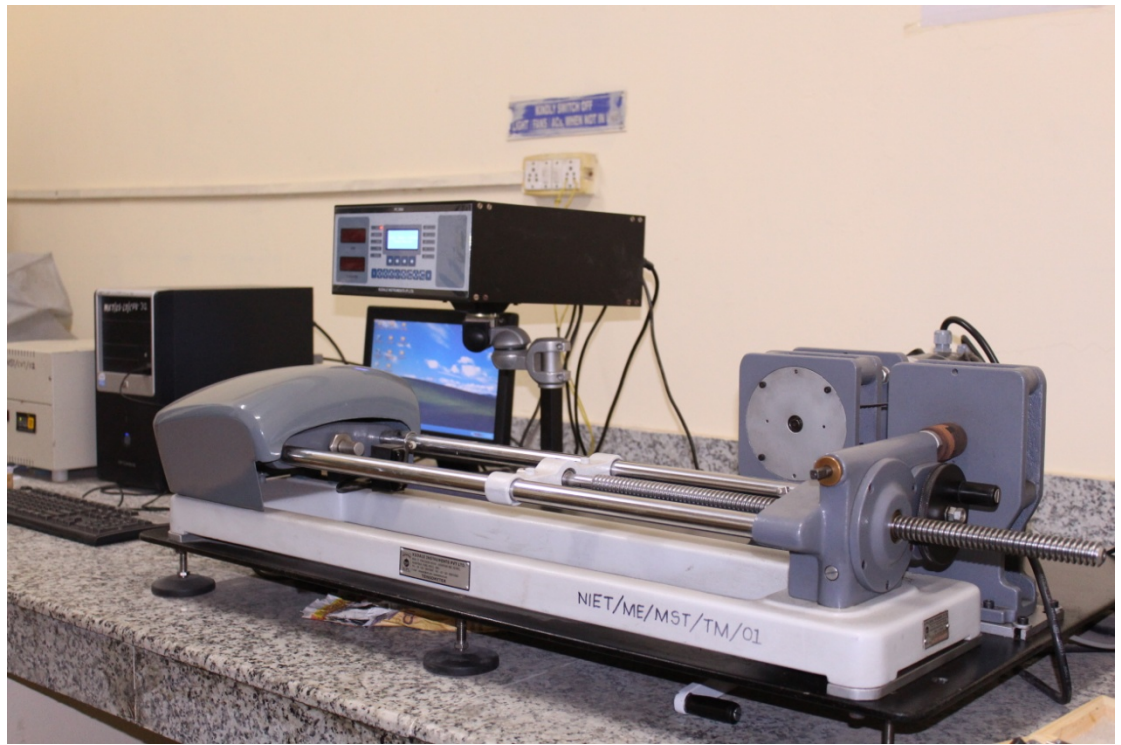
### Machine consists of

- Straining Unit.
- Control Panel Power Pack.
- Hydraulic Controls.
- Load Indicator System.
- Motorized loading and unloading cycle.
- Automatic Continuous Roll Load - Elongation Recorder .

### Software Features

- High speed Data acquisition & Interface card.
- Windows based Software.
- Software can run tests like Tensile, Compression, Bending, Shear.
- Software is easy to navigate through all tests.
- Test report and graphs are printable in hard copy.
- Storage and Retrieval of Data with RDBMS support.
- Online graph is viewable while test is running.
- Data and Result Units selectable.
- Auto detection and built in Safety Protection for over load and over travel.
- Provision for Calculating

**Outcome**- Final year students have done their project work on this machine under the guidance of Mr. Sandeep Chauhan.





## 5. ELECTROCHEMICAL SPARK MACHINING

**Lab Name** - Workshop

**Setup Name**- Electrochemical Spark Machining

**Objective** -Understanding the Machining process.

**Purpose**- Machining

**Location** - Workshop, Ground floor B-Block, Room No-008

Electrochemical spark machining, a manufacturing process employed to intricately shape materials through controlled electrochemical reactions, was developed by students under the guidance of Mr. Rakesh Kumar Singh. The setup utilized an Old CNC milling structure for its framework.

## 6. ELECTROMAGNETIC STIR CASTING

**Setup Name-** Electromagnetic Stir Casting Setup

**Setup established by-** Dr. S L Verma

**Objective-** Student will learn advance stir technique. Students as well as faculties can do their research work or project on this machine.

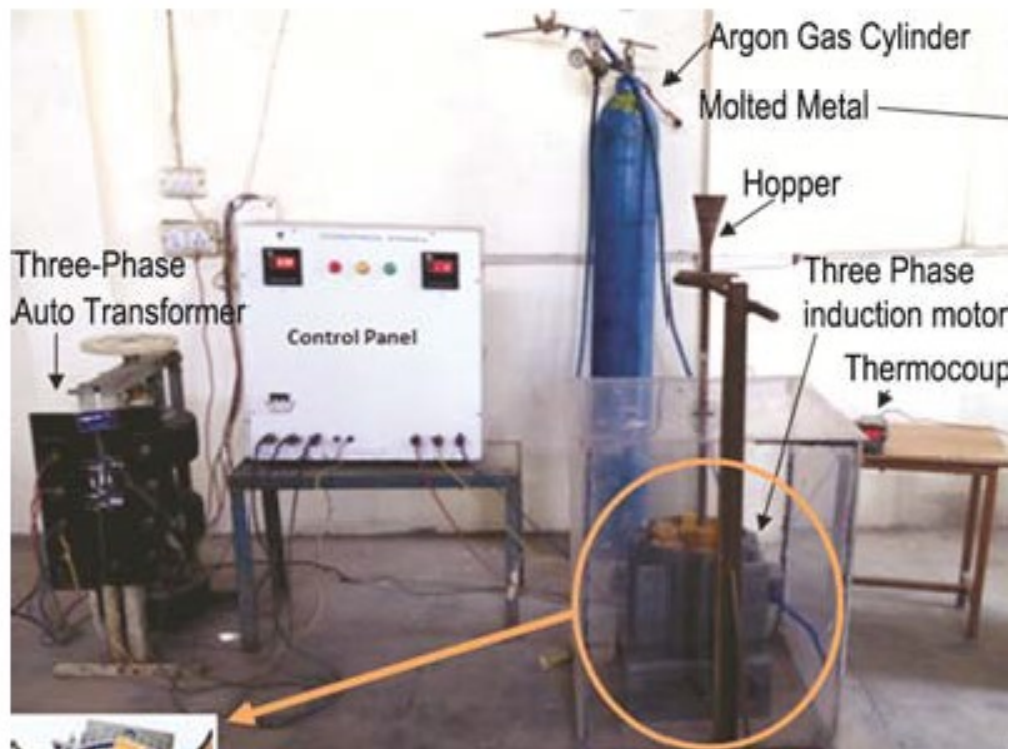
**Purpose -** To stir liquid metal.

**Location-** Workshop lab, Ground floor B-Block

**Machine Specification-**

SN		
1	Motor type	3- $\phi$ induction motor
2	RPM range	250-350
3	Supply type	3- $\phi$ AC
4	Thermocouple type	K Type

**Outcome -** More than 5 research papers have been published by till now by Dr. S L Verma, Dr. Shudir Kumar, Mr. Sanjay Maurya and some students of final year.



# 7. FSP/FSAP ON VMC

**Machine Name-** Jyoti VMC PX-20

**Objective-** PG Students can do FSP/FSAP/FSW on wide variety of materials.

**Purpose-** To perform FSP/FSAP/FSW and different machining operations on material.

**Location-** Smart Manufacturing Lab, Ground floor

## Machine Specification-

S.No.	Particulars	Specifications
1	table size	660 X 360mm to 915 X 460mm
2	X-axis travel range	from 510mm to 760mm
6	Spindle Drive	AC motor rated power 7.5 Kw
7	Speed range	50-7000 RPM
8	Accuracies	X – axis +- 0.005 mm Z – axis +- 0.0075
9	Repeatability	X – axis +- 0.002 mm Z – axis +- 0.003
12	Power supply	3 Phase, 415V, 50Hz

## Safety Precautions while working on Machine:

- 1) Do not alter or modify any machinery, tooling or accessory unless you contact an instructor and obtain permission.
- 2) Review all CNC set up and operating procedures provided.
- 3) Review all CNC programming instructions provided.
- 4) Prepare and review your program carefully.
- 5) Edit your program for safety, format, correctness and clarity.
- 6) It is highly recommended that all programs be verified before the actual trial on the machine.
- 7) Wear safety glasses.
- 8) Wear safety shoes.
- 9) Wear safety gloves.

## 8. REVESE ENGINEERING

**Setup Name-** 3D Scanner

**Setup established by-** Centre of Excellence PTC and NIET.

**Objective-** Student will learn latest technology used in scanning which can be further used in rapid prototyping of products.

**Purpose** – 3D Scanning of different product.

**Location-** Ground floor E-Block Room No. 003

S.NO	NAME OF EQUIPMENTS	DESCRIPTIONS	No. of Units
1.	Computer	OS: Windows 7, 8.1 or 10, 64 bit USB Port: 2 USB ports available (USB 2.0 or USB 3.0) Graphics Card: NVIDIA GTX series graphic card, 660 or higher CPU: Dual core processor (I5) or higher is recommended Display memory: 2GB Memory Storage: 8GB	01

**Outcome-** Students use this facility to scan and 3d printing the product.

## Additional Laboratories

### 9. PLM-PTC CREO LAB

**Lab Name-** PLM

**Setup established by-** Centre of Excellence PTC and NIET.

**Objective-** PLM, an integral component of the PTC Center of Excellence, provides comprehensive training to students in diverse modules of PLM supported by PTC technology. The curriculum for this training program is meticulously crafted by Capgemini, ensuring relevance and depth. Sessions are conducted for students utilizing the extensive infrastructure of the PTC Center of Excellence, which boasts 40 computing facilities along with a dedicated server. Following the training period, students are seamlessly integrated into roles within Capgemini, leveraging their acquired skills and knowledge..

**Purpose** – learning about Product life cycle management.

**Location-** Ground floor E-Block Room No. 003

**Machine Specification-**

SN		
1	Number of computers	40
2	RAM	8GB
3	HDD	500GB
4	Processor	Intel Xenon E3-1226, 3.7 GHz
5	Window	Window 10, 64 bit

**Outcome-** After Training more than 30 students are placed in Capgemini.

# Instructor Certification

THIS AFFIRMS THAT

**Sanjay Kumar**

OF: Noida Institute of Engineering & Technology

IS CERTIFIED TO TEACH Creo for Design Engineers

ON BEHALF OF PTC UNIVERSITY, EFFECTIVE : 29-Apr-2016



*Rajal Batta*  
PTC University  
Authorized Signatory

*Matt Cohen*  
Matt Cohen  
VP, PTC University

**PTC<sup>®</sup> University**

## 10. AUTOMATION LABORATORY

**Lab Name-** Automation Laboratory

**Setup established by-** Centre of Excellence PTC and NIET.

**Objective-** Student will learn the latest technology used in automation and can use it for their projects.

**Purpose** – Automation of different tasks.

**Location-** Ground floor E-Block Room No. 002

S.NO	NAME OF EQUIPMENTS	QUANTITY
1	Pneumatics Trainer KIT (Basic)	1
2	Pneumatics Trainer KIT (Advanced)	1
3	Electropneumatic Trainer KIT (Basic)	1
4	Electropneumatic Trainer KIT (Advanced)	1
5	Modular Manufacturing System (Feeder Station)	1
6	Modular Manufacturing System (Inspection Station)	1
7	Modular Manufacturing System (Sorting Station)	1
8	Magnetic Symbols Box	1
9	Transparent Kit	1
10	Cut Section Kit	1
11	SMPS	2
12	Janatics Animation Software	1

Outcome-

## 11. IDEA LAB

1. **Lab Name-** IDEA Lab
2. **Setup established by-** NIET & AICTE
3. **Objective-** students will go through product development.
4. **Purpose** – learning different skills.
5. **Location-** Ground floor E-Block Room No. 002

List of Major equipment's.

S. No.	Name of Major Equipment	S. No.	Name of Major Equipment
1	Laser Cutter	28	Ratchet Set
2	Vinyl Cutter	29	Router Bit Starter kit
3	3D Printer	30	Scroll Saw
4	3D Scanner	31	Hot Air Blower With Soldering Iron
5	CNC Router	32	Tin Cutter with Spring
6	Drilling M/c 1 HP Motor	33	Centrifugal Blower
7	Handheld High Speed Drilling M/c- 15000 RPM with accessories	34	Vacuum Cleaner
8	Benchtop Grinder Machine	35	Hot Air Gun
9	Advanced, motorized Sewing Machine	36	Micrometer
10	Power Tools	37	Glue Gun
11	Portable Welding M/c	38	Air Compressor
12	Digital Microscope	39	Coil Winding Mic motorized
13	PCB Milling Machine*	40	Plotter -Printer
14	Computer Workstation in networking- 5 Nos	41	HAM Radio transceiver, antenna, and related equipment
15	Scroll Saw Machine	42	Relevant Software (Academic Licenses)
16	Tool Wall covering Perforator	43	Sensor set including sensors for Home/ Industry/ Agriculture Automation, Medical diagnosis
17	Dremel Moto Saw	44	Arduino UNO boards ( 10 sets including USB A to B cable+ male —male connecting wires+ female to female connecting wires-I- male —female connecting wires)
18	Bench Grinding Machine	45	NodeMCU (ESP8266) boards (10 sets ( 10 sets including USB A to B cable+ male —male connecting wires-I- female to female connecting wires+ male —female connecting wires)
19	Power Return Measuring Tape	46	Raspberry Pi 4 boards (05 sets



			including HDMI — mini-HDMI connector, Memory card of 8 GB, adaptor, casing)
20	Tri Square 8"	47	BeagleBone AI for Artificial Intelligence based applications (5 sets)
21	Stainless Steel Ruler	48	BeagleBone -Black-Wireless 5 sets)
22	Digital Vernier Caliper	49	Peripheral sets for Arduino/ NodeMCU/ Raspberry Pi (10 sets)
23	Spirit Level	50	ESP32 CAM Development Board WiFi -I- Bluetooth with OV2640 Camera Module (5 sets)
24	Dremel Cordless Rotary Tool	51	Solnoi Electronics Raspberry Pi 3 Camera Module Night Vision Camera (5 sets)
25	Power Router	52	Flex printing machine
26	Sewing Machine	53	Pallet
27	Impact Drill		

## 12. ROBOTICS LAB

**Lab Name-** Robotics Lab

**Objective-** Robot programming Training, Students can do MIG welding on wide variety of materials. Students as well as faculties can do their research work or project on this machine.

**Purpose-** Training and welding on different materials.

**Location-** B- Block extension, Ground floor

**Machine Specification-**

S.No.	Particulars	Specifications
1	Maximum reach	1101mm
2	Maximum payload	10 Kg
6	Pose repeatability (ISO 9283)	$\pm 0.03$ mm
7	Number of axes	6
8	Mounting position	Floor
9	Footprint	320 mm x 320 mm
12	Weight	approx. 55 kg

**Axis data -Motion range**

A1  $\pm 170^\circ$

A2  $-190^\circ / 45^\circ$

A3  $-120^\circ / 156^\circ$

A4  $\pm 185^\circ$

A5  $\pm 120^\circ$

A6  $\pm 350$

**Operating conditions**

Ambient temperature during operation 5 °C to 45 °C (278 K to 318 K)

Protection rating

Protection rating (IEC 60529) IP54

Protection rating, in-line wrist (IEC 60529) IP54

## **Control**

Controller KR C4 smallsize-2;

KR C4 compact

Teach pendant

Teach pendant KUKA smartPAD

## **Safety Precautions while working on Machine:**

1. Do not alter or modify any machinery, tooling or accessory unless you contact an instructor and obtain permission.
2. Review all robotics set up and operating procedures provided.
3. Review all Robotics programming instructions provided.
4. Edit your program for safety, format, correctness and clarity.
5. It is highly recommended that all programs be verified before the actual trial on the machine.
6. Wear safety glasses.
7. Wear safety shoes.
8. Wear safety gloves.

### 13. RAPID PROTOTYPING LAB

#### Lab Name- Rapid Prototyping Lab

**Objective-** 3D printing of the components.

**Purpose-** Training and 3D printing.

**Location-** E- Block extension, Ground floor

The Rapid Prototyping Lab serves as a dynamic space for students to explore and master emerging technologies. Within this lab, students engage in hands-on learning experiences, particularly focusing on 3D printing techniques. Both B.Tech and M.Tech students leverage this facility extensively for their project work, harnessing its resources to bring their ideas to life through tangible prototypes.

S.NO	NAME OF EQUIPMENTS	SPECIFICATION	QUANTITY
1	Mark forged Onyx pro 3D printer	<b>BUILD VOLUME:</b> 320 mm X 132 mm X 154 mm, <b>Machine wt-16 kg</b> <b>Technology-</b> Fused Deposition Modeling <b>Layer thickness</b> 100, 125, 200 microns <b>Power requirements:-</b> 100–240 V 1.5 A 50/60 Hz, 150 W	1
2	Form labs form 2 3D printer	<b>BUILD VOLUME:</b> 145 mm × 145 mm × 175 mm <b>Layer thickness</b> 25, 50, 100 microns <b>Laser spot size-</b> 140 microns <b>Technology –</b> SLA <b>Power requirements:-</b> 100–240 V 1.5 A 50/60 Hz 65 W <b>Weight-</b> 14 kg	1
3	Delta wasp 2040 turbo 2 3D printer	<b>Base diameter -</b> 20 cm, h-430 mm <b>Layer resolution-</b> 50 microns <b>Weight-</b> 20 kg <b>Power requirements:-</b> 220–240 V, 50/60 Hz, 50 W	1
4	Pratam 3D printer	Filament Sensor, High Speed, Auto Bed Level, Power Failure Protection	1
5	Computer	Intel - 7, RAM -8 GB, 64-bit operating system	4

## 14. ADAM LAB

**Lab Name- ADAM Lab**

**Objective-** Training in Automotives.

**Location-** B & E- Block extension, Ground floor

S No	Lab	Equipment	Specifications	Quantity
1	Engine & Accessories Lab	Petrol Engine	MB M274	1
		Diesel Engine	MB OM642	1
			MB OM651	1
		Automatic Transmission	722.9	1
		Torque Converter		1
		Engine Stand		1
		Engine Crane	Blue Point YA12AP	1
		Bench Vice		1
		Transmission Stand		1
		Tool Trolley		2
		Smart TV	LED TV	1
		Differential		1
		Manual Transmission	TATA	2
		Flywheel		1
		Clutch Plates		3
2	Electrical & Electronics Lab	Electronics Work Bench	XPO-WB	6
3	Workstation	Desktop Lenovo	8 GB Ram, 4 GB integrated Graphics, 2 GB Dedicated Graphics, i7 Processor	6
4	Panel	Panel	XPO- CAT	6
5	Car Bay	Training Car	Mercedes Benz C220 CDI	1
		2 Post Lift	Ravaglioli 4.5T	1
		Compressor with Air Dryer	Chicago Pneumatic 5.5 HP	1
		Battery Charger	Deutronic DBL 1200-14	1
		Diagnosis Kit 3	Mercedes Benz - Xentry	1
		Automatic Tire Inflator	E-012-OD	1

## 15. METAVERSE LAB

**Lab Name- Metaverse Lab**

**Objective-** Training in Metaverse

**Location-** 006 E

The Metaverse Centre of Excellence in AR/VR is a hub for pushing the boundaries of immersive technology. It brings together experts, creators, and learners to innovate and explore the possibilities of augmented and virtual reality. Through collaborative projects and cutting-edge research, it aims to advance AR/VR for innovation, education, and entertainment, shaping the future of immersive computing.

### List of equipment's

- HTC vive cosmos
- VR Headset VIVE Pro – 2
- Camera
- Meta Quest -2
- LAPTOP
- DELL -System
- Samsung TV

