MANUFACTURING PROCESSES LABORATORY

LIST OF THE EUIPMENTS

1) Wood Turning Lathe
2) Hydraulic Press
3) Injection Moulding
4) Arc- Welding
5) Permeability Meter
6) Sand Rammer
7) Universal Sand Strength Machine
8) TIG-Welding
9) Gas Welding
10) Spot welding

Name of the Equipment:	WOOD TURNING LATHE

Wood turning Lathe

Specifications:	Capacity: Light duty bench lathe Size: 4.5’ Length of the bed: 4’ Width of the bed: 150mm Height of the center: 7” Admit between centers: 3’ Power required: 1HP, 3-Ɵ Stroke length: 180mm Face plate: 200 X 15mm Grinding wheel: 200 X 125mm Speed of the motor: 1360RPM

Experiments that can be conducted:

1) Pattern making using wood turning lathe

Research work which can be done: Study of cutting parameters (speed ,feed, depth of cut) on surface finish and dimensional components of wooden components.

Name of the Equipment:	HYDRAULIC PRESS

HYDRAULIC PRESS

Specifications:	Capacity: 25 Tons Motor: 3HP Stroke length: 180mm

Experiments that can be conducted:

1) To cut the blanked object from the given G.I sheet
2) To perform piercing operation on the given blanked object

Research work which can be done : To study of the Effect of Pressure and Material Thickness on Forming Characteristics Using a Hydraulic press

Name of the Equipment:	INJECTION MOULDING

Specifications:	Short Capacity: 30 gms Injection Force: 2tons Heat Capacity: 1KW Motor Capacity: 2HP Die size: 75-200mm

Experiments that can be conducted:

1) To make air tight bottle cap by using Injection Moulding
2) To inject thermo plastic material in to mould for obtaining the desired article

Research work which can be done: Development of biodegradable polymer composites for sustainable manufacturing

Name of the Equipment:	ARC- WELDING

Specifications:	Open circuit voltage: 60 KVA :23KVA Welding Current: 50-350Amps Max Current at duty cycle:350Amps

Experiments that can be conducted:

1) To find effect of polarity on weld strength and identifying the heat affected zone.
2) To find effect of current on weld strength and identifying the heat affected zone.

Research work which can be done: To find heat affected zone for different material.

Name of the Equipment:	PERMEABILITY METER

Specifications:	Net weight: 15 Kgs Gross weight: 30 Kgs Dimensions: 8X8X28 cm Gross dimensions:75X26X23 cm

Experiments that can be conducted:

1) To determine permeability number of green sand

Research work which can be done: To determine the permeability of foundry sand and study how factors such as grain size, moisture content, and compaction affect the flow of gases through the sand mould.

Name of the Equipment:	SAND RAMMER

Specifications:	Net weight: 25 Kgs Gross weight: 40 Kgs Dimensions: 7X8X22 cm Gross dimensions:15X12X28 cm

Experiments that can be conducted:

1) To determine permeability number of green sand

Research work which can be done: To determine how the number and intensity of ramming strokes affect the density, strength, and permeability of moulding.

Name of the Equipment:	UNIVERSAL SAND STRENGTH MACHINE

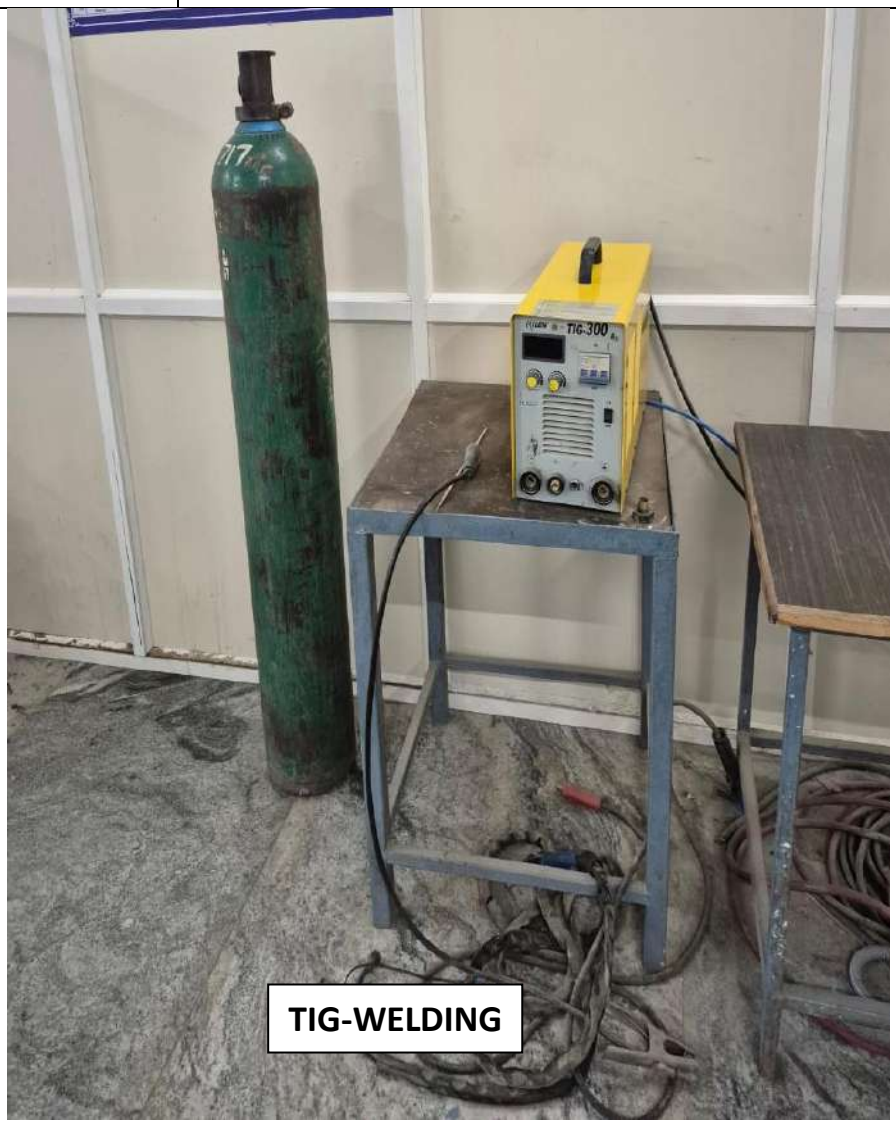
Specifications:	Net weight: 80Kgs Gross weight: 110Kgs Green Compression strength:1.3kg/cm^2 Capacity: 18.7lbs.per.Sq.Inch

Experiments that can be conducted:

1) To find the green compression strength of the given specimen at different percentage of clay and moisture

Research work which can be done: To determine the green, dry, and baked strength of moulding sand and study how variations in moisture content and binder percentage affect its strength characteristics.

Name of the Equipment:	TIG-WELDING



Specifications:	Input Power Frequency:50/60 Power Voltage:380-400 Fuse Current:10-300 Weight:19 kg

Experiments that can be conducted:

1) To prepare a V-butt joint using TIG welding

Research work which can be done: To study the effect of welding current, gas flow rate, and electrode type on the quality, appearance, and mechanical strength of TIG-welded joints.

Name of the Equipment:	GAS WELDING

Specifications:	Type: Double-stage Range: 0–10 bar for both gases Oxygen Cylinder: Working Pressure: 150–200 bar Acetylene Cylinder: Working Pressure: 15–20 bar

Experiments that can be conducted:

1) To prepare a Butt/Lap joint with mild steel strips using gas welding

Research work which can be done: To study how variations in flame type (neutral, carburizing, and oxidizing) and welding parameters such as gas pressure, flame temperature, and welding speed influence the quality and strength of welded joints.

Name of the Equipment:	SPOT WELDING

Specifications:	PR Volts: 220-440 KVA: 10

Experiments that can be conducted:

1) To prepare the Lap joint on the given work pieces using spot welding

Research work which can be done: To study the influence of welding current, electrode pressure, and welding time on the strength and quality of spot-welded sheet metal joints.