Estd. – 2009
A Government Engineering College
E-mail – teqipcell.pmec@gmail.com
Website – www.pmec.ac.in

TEQIP-3
Technical Education Quality Improvement Programme

PARALA MAHARAJA ENGINEERING COLLEGE

(A constituent college of Biju Patnaik University of Technology, Odisha, Rourkela)

SITALAPALLI: BERHAMPUR: DIST.: -GANJAM: PIN – 761003

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Equipment Specifications: TEQIP-III/OD/PMEC 10 & 11 & 02

3D Printer Specifications

Tech Specifications

- Print size (X Y Z) (Not less than) 600 x 300 x 300 mm
- Print Speed- Range 55 -75 mm/sec
- Layer Resolution (Not less than) 100 Microns
- Filament Diameter- Range 1.5mm - 3mm
- Nozzle Diameter (Not less than) 0.4 mm
- Filament Compatibility ABS & PLA
- Print Plate Size (Not less than) 600 x 300 mm
- Print in dual color

Mechanical Specifications

- Chassis Aluminum Extrusion and Metal
- 2 No of Extruders
- Print Plate (Build Platform) Glass fiber

Software Specifications

- 3D Printing Software Pronterface, Cura, STRATA
- Supported File Formats .stl, .gcode
- Operating System Windows, Linux, MAC

Electrical Specifications

- AC Input 12V, 30Amp
- Power Requirements 450 watt, 12V
- Connectivity (Interface) USB Cable, Micro SD Card
- Electronics Specifications
- Electronics (Motherboard) Print Board REV D

3D Scanner

Technical Specifications

- Scan technology DIY 3D rotational laser triangulation scanner
- Scan Area (Not less than) 250 (Rad)mm x205 (h)mm
- Scan speed Range 2-8 minutes
- Accuracy (Not less than) 0.5 mm
- Resolution (Not less than) 0.5 mm
- Triangles per 3d model Min 80 (variable by software)
- Turntable drive system Nema stepper motor (1.7 A 1.8 deg/step)
- Maximum weight on Turntable 3 kg and above.
- Exported file type- . ply (Horus open source). Export to. stl through open source software like Blender or MeshLab.

Software Specifications

- Operating System- Linux, Windows.

Other Specifications

- Connectivity (Interface)USB

EDM Machine

Specifications

Work Tank	mm	900 X 550 X 375 (Not less than)
Work Table	mm	600 X 400 (Not less than)
X Travel	mm	350 (Not less than)
Y Travel	mm	225 (Not less than)
Z Travel	mm	250 (Not less than)
Pulse Generator Current	Amps	50 (Not less than)
Input Power Supply	Volts	3 Phase AC , 415 V, 50 Hz (Minimum)
Avg Power Consumption	kVa	1.3-2.3 kVa or better

With Color Display, moving table type with work tank 900 X 550 X 375 AND PULSE GENARATOR CURRENT OF Min 50 Amps for heavy job capacity. Should have MOSFET controller.

DRILL TOOL DYNAMOMETER

Drill tool dynamometer for measurement of both the thrust force of the control and the torque produced on the work piece. Will be used to establish drilling force, study tool configuration and lubricant characteristics. DIGITAL MULTICOMPONENT FORCE INDICATOR (TWO CHANNEL)

Specifications:

- Force: Torque and Thrust.
- Range of force: Thrust Not Less Than 10 kgm ½ inch bolt mounting - 100kg – 500kg.
- Sensor: 4 arm bonded strain gauge Component Bridge for each force.
- Bridge resistance: 350 ohms typical.
- Bridge Voltage: 12 Volts Max.
- Linearity: ± 1% of full scale.
- Accuracy: ± 1% of full scale.
- Additional Facility: Self centering vise 3” size to hold the Specimen

LATHE TOOL DYNAMOMETER

The Lathe Tool Dynamometer should have been designed so that it can be directly fixed on to the tool post using the hole provided on the dynamometer. The dynamometer should measure 3 forces in mutually perpendicular directions, i.e. horizontal, vertical and thrust. It should have a temperature indicator.

Specification:

Force: XYZ direction.
Range of force: For force in XYZ direction Model 100kg - 500kg.

Sensor: 4 arm bounded strain gauge Component Bridge for each force.

Bridge resistance: 350 Ohms typical.

Bridge voltage: 12 volts Maximum.

Linearity: ±1% of full scale

Accuracy: ±1% of full scale.

Tool post diameter: 20mm (any other size required to be indicated) Center height: To be indicated.

CNC MILLING MACHINE

Sl. No.	Description	Dimension
1.	Details Specification	
a	Table size	Not less than 1060 X 315mm
b	Table Traverse	Not less than
	X-Axis	800mm
	Y-Axis	350mm
	Z- Axis	380mm
c	Spindle speed	
	Maximum speed	Not less than 6000 rpm
d	Spindle power (Cont./15min. rating)	3.7/5.5KW
e	Tool holder taper	BT 40
2.	Desirable Specification:	
a	Feed rate	1-5000 mm/min or more
b	Accuracy	
	Positioning	0.01 mm or better
	Repeatability	0.005 mm or better
	Rapid Travers XYZ	Not less than 10m/min
3.	Standard Machines Acessories along with machine:	
a	Coolant Tank,Chip Tank,Safety Guard,Pneumatic Tool, Clamp/De-clamp, CNC systems FANUC (Latest), Standard work Lams, Manual Pulse Generator, Graphic with tool path verification, Panel cooler AC, DNC Drip feed facility, Rigid tapping, RS 232c serial interface, Flood coolant around spindle, Maintenance tool kit.	
b	Instruction manual (2 nos)	
4.	Accessories (Additional)	
a	Dia 1 mm – 20mm colet with variation of 1 mm	1 set
b	Drill chuck with adopter	2 nos
c	Hydraulic system for tool clamp/unclamp	
	(Alternative to pneumatic systems)	
d	Collet adopter	1 no
e	Stub arbor (sk22,sk27,sk32,sk40)	1 each
f	Morse taper adopter for fitting drill	1 no
5.	Specification for CNC control	
6.	Armless disc type automatic tool changer	
	No of tools	10
	Maximum tool diameter	Not less than 80mm
	Maximum tool length	Not less than 200mm
	Maximum tool weight	6kg

ALL GEARED CONVENTIONAL LATHE ESSENTIAL SPECIFICATION

CAPACITY	
Height of Centers	Not less than 180 mm
Swing over bed	Not less than 360 mm
Swing over cross slide	Not less than 200 mm
Distance between center	Not less than 750 mm
Bed Width	Not less than 250 mm
MAIN SPINDLE	
Type & Size spindle nose	A/2 Camlocck-4
Taper bore in Centre Sleeve	MT-4
Spindle Bore	42 mm
TAIL STOCK	
Taper bore in spindle sleeve	MT-3
Spindle Travel	Not less than 140 mm
CARRIAGE	
Cross slide travel	Not less than 240 mm
Top Slide Travel	Not less than 120 mm
Tool Shank Section	Not less than 20x20 mm
SPEEDS	
No. of Speeds	Not less than 9
Range	60-2000 or better
FEEDS	
No of feeds	24 or better
Range: Longitudinal/rev	0.05-0.75 or better
Transverse/rev	0.025-0.375 or better
THREAD/NO. RANGE	
Metric	0.5 – 7.5
Inch	4-60 TPI
D. P.	8-120 DP or better
Module	0.25 -3.75 MOD or better
ELECTRICALS	
Main Motor	3.0 Kw -4Kw
Coolant Pump	0.06Kw

HORIZONTAL SURFACE GRINDING MACHINE

Sl. No	SPECIFICATION	REQUIREMENT
TABLE		
1	Working Area	Not less than 460x200MM
2	Longitudinal Table travel automatic Hydraulically operated	Not less than 540mm
3	Cross feed table travel	Not less than 540 mm
4	Distance spindle centre to table	Not less than 475 mm
WHEEL HEAD		
5	Spindle Speed	2850 RPM or Better
6	Wheel Dimension	180 x 13 x 31.75 or Better
FEEDS :-		
7	Vertical Feed Manually	0.01 mm or Better
8	Longitudinal Speed	25-May
9	Cross Feed on Hand Wheel	4 mm /Rev
MOTORS :-		
10	Spindle Motor	1.5kx or better
11	Coolant Motor	0.95kw or better
12.	Parallelism	0.008 MM per entire working area
13	Flantness	0.02 MM on entire working area
14	Spindle run out	0.005 MM or better
15	Roughness value	0.02 to 0.08 microns
16	Elevation least count	0.001

STANDARD ACCESSORIES REQUIRED

1. Precision static wheel balancing unit with mandrel
2. Micro feed on vertical mechanism
3. Micro feed on cross mechanism
4. Coolant system with magnetic separator
5. Lighting equipment with low volt transformer
6. Precision vice 100mm opening

UNIVERSAL MILLING MACHINE

TECHNICAL SPECIFICATIONS	
Type	Knee type with all three feed auto
Working Table	Not less than 1300 mm X 275 mm
Table T Slots (No./Width/Distance)	Not less than 3 nos. X 14 mm X 60 mm
Table Swivel	±45°
Spindle Nose	ISO-40
Spindle Speed Range	50 to 950 RPM (8 steps)
Longitudinal traverse	Not less than 650 mm
Cross Traverse	Not less than 230 mm
Vertical traverse	Not less than 350 mm
No. of feed	Not less than 12
Longitudinal feed range	16 to 400 mm / min
Cross feed range	16 to 400 mm / min
Vertical feed range	4 to 100 mm/min
Rapid traverse	Not less than 1000 mm/ min
Main motor	3 HP/950 RPM
Feed motor	2 HP / 950 RPM
Coolant Motor	0.1 HP/2800 RPM
Approx. Weight	2000 kg
STANDARD ACCESSORIES	
Complete electricals (Motor, Starter, Fittings, control panel)	Coolant Systems
Long Arbour 25.4 mm	Lubrication Pump
Chip Tray	Vertical Milling Attachment
Machine Lamp	Service tool kit
Milling cutters (face cutter, side & Shoulder, End Mill) 1 each	Milling Vice with Swivel Base 125 mm
Operational Manual Book	Set of Foundation Bolts
ADDITIONAL ACCESSORIES	
Self-Centering Vice 100 mm	Rotary Table 250 mm
115 mm Dividing head with tailstock	Slotting attachment
100 mm true chuck for dividing head	Collet chuck ISO-40
Set of collets (10 nos) 4 to 25 mm	Stub Arbour ISO-40

Electro chemical Machining Setup

Technical Specifications

- Tool area – (Not Less Than) 30 mm^2.
- Cross head stroke - (Not Less Than) 150 mm.
- Job holder - 100 mm opening X 50 mm depth X 100 mm width.
- Tool feed motor - DC Servo type.

Control Panel Technical Specifications

- Electrical Out Put Rating - 0-300 Amps. DC at any voltage from 0 - 20 V.
- Efficiency - Better than 80% at partial & full load condition.
- Power Factor - Better than 85.
- Protections - Over load, Short circuit, single phasing.
- Operation Modes - Manual / Automatic.
- Timer - 0 - 99.9 min.
- Tool Feed - 0.2 to 2 mm / min.
- Z Axis Control - Forward, reverse, auto forward / reverse, through micro controller.
- Supply - 415 v +/- 10%, 3 phase AC, 50 Hz.

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Procurement Co-ordinator TEQIP Cell

/ Workshop Superintendent

PMEC BAM

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HOD Production Engineering

PMEC BAM