LIST OF EQUIPMENT IN PROCUREMENT

No	Name	Specification	Picture	Amount	Functions and usability
1	Automatic Surface Grinding Type SGS 1020 AHD/SD	Specification Max Grinding Surface : 10" x 20" (254x508), Max Table Travel: 22,2" (565), Max Cross Travel : 10,4 (263) Distance between table surface and spindle center : 19,7 (500) Table Speed : AHD-240- 1000"/ min (6-25 M/mm), SD-80 - 1040"/ min (2-26 M/mm)		1	1. As a tool for smoothing the surface roughness of the workpiece after going through the machining process. 2. To improve the quality of product
2	Software Solidwork Education 2020	For 30 Computer Licenses, a training package for lecturers and certificates as a trainer for lecturers		1	Official license as the legality of using the software by lecturers and students
3	Hydro generation	Labtech model : LLC-MHY. This trainer is designed to study micro hydro development		1	As a visual media for the course of Energy Conversion
4	Solar and Wind Turbin energy Trainer	LABTECH Model: LLC-SWD-1, Can operate independently, equipped with programmable speed control.		1	As a visual media for the course of Energy Conversion

5	"Desktop Scanning Electron Microscope (SEM) Brand: Thermo Scientific Model: Phenom ProX Country of Origin: Holland"	Platform: Desktop SEM with : - Imaging module - Diaphragm vacuum pump - Power supply - Monitor : interactive Monitor for use purposes and a separate Monitor for Elemental analysis purposes. - System including min. 19" monitor with PC and network router mounted Imaging modes : Light Optical Magnification Range : 20 – 134x Electron Optical Magnification Range: 80 – 150000x Digital zoom max. 12x Illumination : Light optical : Bright field / dark field modes Electron Optical : - Long-lifetime thermionic source (CEB6) - Low, Imaging, Spot Analysis and Mapping mode, beam current selection Acceleration Voltages : - Default: 5kV, 10kV and 15kV - Advanced mode : adjustble range between 4.8kV and 15kV imaging and analysis mode Resolution : < 10nm (BSED) < 8nm (SED)		1	1. As a very high magnification tool. 2. To specify the element of the material / object 3. Indispensable for all fields of science, especially for Mechanical Engineering.
6	"Universal Testing Machine Floor 300 kN Brand: A & D TENSILON	Floor model Universal Testing Machine Loading system: Closed-loop microcomputer controlled digital servomechanism Maximum Capacity: 100 kN Effective test width: 590 mm Crosshead Stroke: 1160 mm Effective stroke: 720 mm Crosshead Speed: 0,0005 ~ 1000mm/min Crosshead speed accuracy: ±0.1% Crosshead random speed: 0.0001mm/min step in crosshead speed range Crosshead speed and load capacity: Maximum load capacity in full speed range		1	For material testing to obtain the tensile and compressive strength of materials in the course of Material Testing

		Crosshead return speed: 1000mm/min or 500mm/min Load measurement accuracy: ±0.5% of reading (within range of 1/1 - 1/500 of load cell rating) Load range: Fully automatic range switching (up to 128 folds) Load calibration: One touch operation load calibration with the calibration circuit embedded in the load cell. Equipped with a load cell rating discrimination function Sampling speed: 1msec Safety function for overload Stroke limiter: Upper/lower limit 2 points Power Consumption: 3,500 VA Input Channel: 13 channels			
7	Manual Milling Machine Merk : KentUSA Type : KTM-4VKF-E	Table size 12” x 50” Table travel (X-axis) 33” Saddle travel (Y-axis) 18” Knee travel (Z-axis) 17.25” Quill travel 5” Ram travel 22” Spindle motor 3 HP (Inverter duty) Spindle speed 60-550-4500 (2 range, Hi/Low) Spindle taper R-8 (NMTB-30 option available) Quill diameter 3.375” Quill feed rate 0.0015/0.003/0.006” per rev Drilling capacity (manual) 0.75” diameter Drilling capacity (power) 0.37” diameter Boring capacity 6.0” diameter Milling capacity 2.0 in3/min Maximum work load (center) 850 lbs Machine Net weight 3400 lbs Shipping Weight/Dimension: 3500 lbs 72” x 72” (skid) Power Requirements: 220 volts, 3 phase, 60 Hz, 10 Amp (optional 440v requires 5 Amp) AC-Frequency drive can also accept 220v, 1-phase power (15A) without a phase converter, ideal for customers with only 1-phase power		1	As one of the main machine tools in a machining workshop

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<td>Kent USA KUM-2500UM Universal Milling Machine</td>
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<tr><th colspan="2">SPECIFICATIONS</th><th>KUM-2500UM</th></tr>
<tr><td rowspan="5">TABLE</td><td>Working Surface</td><td>13.7" x 72.8" (Opt. 13.7" x 59")</td></tr>
<tr><td>Maximum Load</td><td>1540 lbs (700 kgs)</td></tr>
<tr><td>Number of T-Slots</td><td>5</td></tr>
<tr><td>Distance between T-Slots</td><td>60 mm</td></tr>
<tr><td>Maximum Swivel Angle of Table</td><td>45 degrees</td></tr>
<tr><td rowspan="4">TRAVELS</td><td>Longitudinal (Auto) X Axis</td><td>46" (1150 mm)</td></tr>
<tr><td>Cross (Auto) Y Axis</td><td>15 3/4" (400 mm)</td></tr>
<tr><td>Vertical (Auto) Z Axis</td><td>20" (550 mm)</td></tr>
<tr><td>Distance from Spindle to Overarm</td><td>6" (155 mm)</td></tr>
<tr><td rowspan="5">SPINDLE</td><td>Taper</td><td>ISO 50 (Opt. ISO 40)</td></tr>
<tr><td>Speed Range (RPM)</td><td>40 ~ 1800</td></tr>
<tr><td>Number of Speeds</td><td>12</td></tr>
<tr><td>Milling Arbor Diameter</td><td>1" or (27 mm)</td></tr>
<tr><td>Main Shaft Nose Diameter</td><td>88.88 ~ 128.57 mm</td></tr>
<tr><td rowspan="4">FEEDS</td><td>Longitudinal and Cross</td><td>0.4" ~ 47" (10 ~ 1208 mm)</td></tr>
<tr><td>Vertical</td><td>0.2" ~ 23" (5 ~ 604 mm)</td></tr>
<tr><td>Rapid Traverse for X & Y Axis</td><td>47"/min (1208 mm/min)</td></tr>
<tr><td>Rapid Traverse for Z Axis</td><td>23"/min (604 mm/min)</td></tr>
<tr><td rowspan="3">MOTOR</td><td>Spindle</td><td>10 HP</td></tr>
<tr><td>Feed</td><td>2.5 HP</td></tr>
<tr><td>Coolant Pump</td><td>1/8 HP</td></tr>
<tr><td rowspan="4">MOTORIZED OVERARM</td><td>Spindle Taper</td><td>ISO 50 (Opt. ISO 40)</td></tr>
<tr><td>Number of Speeds</td><td>12</td></tr>
<tr><td>Speed Range (RPM)</td><td>35 ~ 1600</td></tr>
<tr><td>Power HP</td><td>5.5 HP</td></tr>
<tr><td rowspan="3">DIMENSION & WEIGHT</td><td>Packing Dimension</td><td>70" x 89" x 88" (1.8 x 2.3 x 2.3 m)</td></tr>
<tr><td>Gross Weight</td><td>7770 lbs (3500 kgs)</td></tr>
<tr><td>Net Weight</td><td>7040 lbs (3200 kgs)</td></tr>
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<td>As one of the main machine tools in a machining workshop</td>
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<td>Manual Lathe Machine Merk : KentUSA Type : SSM-1340BV</td>
<td>Machine Capacity
Swing over bed 13” (330 mm)
Swing over cross slide 8-1/4” (210 mm)
Swing over gap 18-1/2” (470 mm)
Width of bed 7-1/2” (190 mm)
Distance between
centers
40” (1000 mm)
Cross slide travel 6-3/4” (170 mm)
Top slide travel 3-1/2” (90 mm)
Main Spindle
2 Speeds ranges 40-365 & 218-2000RPM
Through hole diameter 1-9/16” (40 mm)
Spindle nose ASA D1-4 camlock
Spindle bore taper MT #5
Threads
Standard (Whit-worth) 34 (2-56) TPI
Metric pitch 33 (0.5-12) MM
Module (mm)
Diametral</td>
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<td>As one of the main machine tools in a machining workshop</td>
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		Feeds Longitudinal feed range 0.0016”-0.046” Cross feed range 0.0005”-0.015” Leadscrew Leadscrew diameter 7/8” (22 mm) Thread pitch 8 TPI Tailstock Quill travel 4” (100 mm) Quill diameter 1-9/16” (40 mm) Quill bore taper MT #3 Power Main motor 3 HP (infinitely variable speed, 3-phase or single phase, 60 Hz) Coolant pump motor 1/8 HP (3-phase or 1Ø)			
10	Acoustic Emission sensor	Tipe 8152C0050000, brand KISTLER. Frequency range 50-400 kHz. Sensitivity 57 dBref 1V/ m/s		1	To monitor the plastic deformation of materials during the machining process
11	Zener Barrier	Tipe 5252A, Brand KISTLER. Conforms to ATEX Directives 94/9/EC & 2014/34/EU II 1GD IEC/EN60079-11; CSA Class I, Zone 0 & Class I, Zone 20. 6 MHz cut-off frequency		1	To monitor the plastic deformation of materials during the machining process
12	Piezotron AE coupler	Tipe 5125C, brand KISTLER. IP57 protection. conforming to EC ATEX Directive 94/9/EC ll 1GD & II 3G EN 60079-11 ia IIC T6 & EN 60079-15 Ex nA llC T6. Selectable gain: x1, x10, x100, x1 000. Selectable filters: 1 ... 1 000 kHz		1	To monitor the plastic deformation of materials during the machining process

13	Data Acquisition	Tipe KiDaq module 5512A, Brand KISTLER. 4 channel analog input. A/D conversion 100 kSps sampling rate per-channle, 24 bit resolution. Frequency range (-3dB) [Hz]: 0…23000.		1	To monitor the plastic deformation of materials during the machining process
14	Forces in Various Single Plane Trusses (Gaya pada truss)	[1] Investigation of bar forces in a statically determinate truss [2] Construction of various trusses possible [3] 2 supports with node discs [4] Load application device with force gauge mountable on different node discs [5] Strain gauge to measure force on each bar		1	As one of the topics in practicum of Machine Basic Phenomenon
15	Interactive Smart Board	Type : 7286 serie, Brand : SMART		1	As a tool / visual media in Micro Teaching class for lecturers and students
16	Bomb Calorimeter, Brand : IKA, Model : C 3000 isoperibol Package 1/12	Country of Origin: German Easy handling by touch screen operation or a standard USB mouse Two different starting temperatures to choose from (22°C, 30°C) Automatic ignition, automatic water filling and draining, automatic oxygen filling Several interfaces: Ethernet, RS 232, USB, SD card slot Six temperature sensors to monitor all temperatures allowing best analyses		1	As a measuring tool in the courses of Thermodynamics and Heat Transfer