№	Subject	Equipment	Image	Description	Quantity
1	Fundamentals of industrial technical drawing and CAD	Computer workstation		video card: GeForce RTX 4060 CPU: Intel Core i5-13500 2500 MHz RAM: 32 GB DDR4 3600 MHz motherboard: Intel B760 SSD drive: 500 GB M.2 SSD power unit: 600 W, 80 PLUS Bronze WiFi: built-in Wi-Fi adapter Monitor: 24"" Full HD IPS LED operating system: Microsoft Windows 11 Pro OEM"	50
		Solidwork licence			50
2	Fundamentals of Business Information Systems and Internet of Things	Arduino board		Microcontroller: ATmega328P Operating Voltage: 5V Input Voltage (recommended): 7-12V Inout Voltage (limit): 6-20V Digital I/O Pins: 14 (of which 6 provide PWM output) PWM Digital I/O Pins: 6 Analog Input Pins: 6 DC Current per I/O Pin: 20 mA DC current for 3.3V Pin: 50 mA Flash Memory: 32 KB (ATmega328P) of which 0.5 KB used by bootloader SRAM: 2 KB (ATmega328P) EEPROM: 1 KB (ATmega328P) Clock Speed: 16 MHz LED_BUILTIN: 13 Length: 68.6 mm Width: 58.4 mm Weight: 25 g	30
3	Introduction to materials and technologies for the manufacturing industry	Tools for CNC machines			1
				Model: ST7090-2F Table Size: 700mm×900mm Working Area: 700mm×900mm×300mm X/Y/Z Axis Movement Accuracy: ±0.01/300mm X/Y/Z Axis Repetition Accuracy: 0.005mm Gantry Width: 820mm Max Loading Weight: 350kg Pressure Deformation of Working Table: <0.02mm (300kg) Spindle Power: 2.2KW (Optional 5.5KW) Tool holder: BT20 (Optional BT30) Spindle rotate speed: 3000-18000rpm Max movement speed: 12m/min Total power: 13.5KW Motor: Yaskawa Servo Motor Power supply: 380V ± 10%50Hz	1
		Ansys Granta EduPack			50
		3D printers		Model: ST7090-2F Table Size: 700mm×900mm Working Area: 700mm×900mm×300mm X/Y/Z Axis Movement Accuracy: ±0.01/300mm X/Y/Z Axis Repetition Accuracy: 0.005mm Gantry Width: 820mm Max Loading Weight: 350kg Pressure Deformation of Working Table: <0.02mm (300kg) Spindle Power: 2.2KW (Optional 5.5KW) Tool holder: BT20 (Optional BT30) Spindle rotate speed: 3000-18000rpm Max movement speed: 12m/min Total power: 13.5KW Motor: Yaskawa Servo Motor Power supply: 380V ± 10%50Hz	1

				Specification	
4	**Introduction to Mechanics**	**FL 100 Strain gauge training system**		**Specification** experimental unit investigating the fundamentals of strain gauge measurement tension, bending and torsion tests each with strain gauge measuring points in full bridge circuit	1
		FL 100.01		strain gauge application areas protected by Plexiglas cover steel test bodies measuring amplifier with 4-digit digital display frame to house the measuring	1
		FL 100.02		objects determination of modulus of elasticity on various materials using measuring objects FL 100.01, FL 100.02, FL 100.03 storage system to house the components	1
		FL 100.03.		**Technical data** Tension bar measuring length: 50mm cross-section: 2x10mm2 modulus of elasticity: 191000N/mm2 Poisson's ratio: 0,305 Bending bar length: 385mm cross-section: 5x20mm2 modulus of elasticity: 210000N/mm2 Torsion bar length: 500mm, Ø=10mm shear modulus: 80000N/mm2 Weights small: 10x 0,5N, 1x 1N (hanger) large: 1x 5N, 2x 10N, 1x 20N, 1x 5N (hanger) Strain gauge measuring point: full bridge, 350Ω Measuring amplifier measuring range: ±24mV resolution: 1µV zero balancing adjustment range: ±1mV supply voltage: 10VDC Frame opening WxH: 480x450mm 230V, 50Hz, 1 phase 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase UL/CSA optional	1
		Tm 150 vibration trainer		**Specification** vibration trainer with experiments on damping, resonance, dual-mass system and vibration absorption 6 pendulum oscillators, 2 bar-type oscillators and 1 spring-mass oscillator	1
		TM 150.20		electrical imbalance exciter control unit for the imbalance exciter with a digital frequency display and a TTL output for triggering external devices tuneable absorber with a leaf spring	1
		150.02.		adjustable oil damper electrically operated drum recorder for recording free vibrations polar chart recorder for determining the amplitude and phase of forced vibrations Technical data Beam, rigid: LxWxH: 700x25x12mm, 1,6kg Beam, elastic: LxWxH: 700x25x4mm, 0,6kg Tension-pressure springs 0,75N/mm 1,5N/mm 3,0N/mm Imbalance exciter 0…50Hz 100cmg Oil damper: 5…15Ns/m Absorber leaf spring: WxH: 20x1,5mm total mass: approx. 1,1kg tuneable: 5…50Hz Drum recorder: 20mm/s, width 100mm Polar chart recorder: Ø 100mm 230V, 50Hz, 1 phase 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase UL/CSA optional	1

				Specification	
		GL 140 Dynamic behaviour of multistage planetary gears		**Specification** investigation of the dynamic behaviour of a 2-stage planetary gear three planet gears per stage four different transmission ratios possible gear is accelerated via cable drum and variable set of weights weight raised by handwheel; ratchet prevents accidental release clamping roller freewheel enables free further rotation after the weight has been released shock absorber for weight safety devices: transparent protective cover with safety lock and protective grill for the set of weights force measurement on different gear stages via 3 bending bars, display via dial gauges inductive speed sensors GUNT software for data acquisition via USB under Windows 10 **Technical data** 2-stage planetary gear module: 2mm sun gears: 24-tooth, d-pitch circle: 48mm planet gears: 24-tooth, d-pitch circle: 48mm ring gears: 72-tooth, d-pitch circle: 144mm Drive set of weights: 5…50kg max. potential energy: 245,3Nm Load at standstill weight forces: 5…70N Measuring ranges speed: 0…2000min-1 230V, 50Hz, 1 phase 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase UL/CSA optional	1
6	Quality management and measurement Laboratory	**Matlab with Simulink licence**		Intended use: Academic. Licence term: Perpetual	50
		Analog Caliper		**Analog Caliper:** Units: Metric; Range: 0-150 mm ;Accuracy : ±0.05mm Mass: 143 g ;Graduation 0.05mm ; Order Number: 530-101 The Mitutoyo Vernier caliper features a 14-degree face angle for easier reading and helps prevent parallax error in the measurement. Link: https://www.mitutoyo.com/products/small-tool-instruments-and-data-management/calipers/vernier-calipers/vernier-scale-caliper/	15
		Digital Caliper		**Digital Caliper:** ABSOLUTE Digimatic Caliper Units: Metric; Range: 0-150 mm ;Accuracy : ±0.02mm Resolution: 0.01 mm, Repeatability: 0.01 mm; SPC Output: YES; Mass: 168 g ;Graduation 0.05mm ; Order Number: 500-151-30; Display: LCD; The Mitutoyo ABSOLUTE digital caliper delivers accurate, repeatable outside dimension, inside dimension, depth and step measurements with accuracy and unrestricted speed. Link: https://www.mitutoyo.com/products/small-tool-instruments-and-data-management/calipers/digimatic-calipers/absolute-digimatic-caliper/	15
		Analog Micrometer		**Analog Micrometer** – Ratchet Thimble Micrometer Units: Metric; Range: 0-25 mm ;Accuracy : ±2 μm; Graduation: 0.001 mm Resolution: 0.001 mm, Flatness: 0.6 μm; Paralelism: 2 μm or Less; Mass: 180 g ; Order Number:102-707; Link: https://www.mitutoyo.com/products/small-tool-instruments-and-data-management/micrometers/mechanical-micrometers/ratchet-thimble-micrometer/	15
		Digital Micrometer		**Digimatic Micrometer** – MDC Lite: Units: Metric; Range: 0-25 mm ;Accuracy : ±2 μm Resolution: 0.001 mm, Flatness: 0.3 μm; Paralelism: 2 μm or Less; Mass: 270 g ; Order Number:293-821-30; Display: LCD; Link: https://www.mitutoyo.com/products/small-tool-instruments-and-data-management/micrometers/digimatic-micrometers/digimatic-micrometer-mdc-lite-friction-thimble/	15
		Gauge block sets		**Metric Rectangular Gage Block Set**: Order No: 516-945-26 No Block per seat: 87 Material: Steel Grade: 00 Size: 1.01-1.49 Step: 0.01 Units: Metric; Shape: Rectangular The Mitutoyo Metric Rectangular 1mm Base Gage Block Sets are available in different grades, sizes and steps, offering exceptional precision and stability for calibration and manufacturing traceability. link: https://www.mitutoyo.com/products/small-tool-instruments-and-data-management/instruments-and-reference-gages/gage-blocks/metric-rectangular-gage-block-set-1mm-base-2/	2

			LVDT sensor		**LVDT sensor DAA:** Model : DAA 25 Inductive LVDT sensor Integrated electronics robust housing 25mm High quality linear bearings Measuring range 25 ... 1000 mm Supply 24 VDC Output 4...20mA / 0...20mA With free or guided Core rod Nominal Stroke: ±12.5 mm Mechanical Stroke: 27 mm Sensor weight: 240 g link: https://www.messotron.com/products/lvdt-lvit-sensors/lvdt-sensor-daa	1
			Load Cell		**Load Cell** Siwarex WL 280 Load Cell RN-S SA 60kg C3 - Rated Load 60kg - Accuracy class C3 according to OIML R60, - 3 m Cable length, 4 Wires - Made of Stainless steel - protection class IP68 link: https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10121226?tree=CatalogTree	1