Contribution of Research Innovation, Incubation & International Linkage (RIIIL)

Research Instruments in number:

Number of Research Instruments				
Sr. No.	**Faculty**	**School**	**No. of Instrument/System Name**	**Total**
1	**Faculty of Science and Technology**	**School of Mechanical and Manufacturing Sciences**	**5**	**5**
2	**Faculty of Science and Technology**	**School of Civil and Environmental Sciences**	**1**	**1**
3	**Faculty of Health Sciences**	**School of Pharmaceutical Science**	**20**	**20**
Total				**26**

Details: List of Research Related Instruments

List of Research Related Instruments					
Sr No	**Faculty**	**Name of School**	**Instrument/ System Name**	**Specifications**	**Application**
1	Faculty of Science and Technology	School of Mechanical and Manufacturing Sciences	AI Based Six DOF Articulated Robot	230V 6 Amp power supply (3 qty), Proper Earthing (≤2Vac between Neutral and Earth, 2 separate preferred), Entrance door ≥1.2m wide, Table size approx. 1060mm x 1000mm x 1630mm, Extension board (if needed), LAN cable 3m (1 qty)	Automated manipulation, assembly, welding, painting, pick and place operations, research in robotics and AI. Six degrees of freedom allow for complex movements.
2	Faculty of Science and Technology	School of Mechanical and Manufacturing Sciences	AI Based Four DOF SCARA Robot Cell	230V 6 Amp power supply (3 qty), Proper Earthing (≤2Vac between Neutral and Earth, 2 separate preferred), Entrance door ≥1.2m wide, Extension board (if needed), LAN cable 3m (1 qty)	High-speed, precise pick-and-place operations, assembly, material handling, particularly suited for planar movements. SCARA (Selective Compliance Assembly Robot Arm) robots are efficient for tasks in a plane.
3	Faculty of Science and Technology	School of Mechanical and Manufacturing Sciences	Motion Control Experimental Setup	230V 6 Amp power supply (3 qty), Proper Earthing (≤2Vac between Neutral and Earth), Extension board (if needed), LAN cable 3m (1 qty)	Investigation and experimentation with different motion control techniques, including servo motors, stepper motors, and various control algorithms. Learning about feedback systems and automation.

Sr No	Faculty	Name of School	Instrument/ System Name	Specifications	Application
4	Faculty of Science and Technology	School of Mechanical and Manufacturing Sciences	IOT, PLC & Manual based Electro-Pneumatic System	230V 6 Amp power supply (3 qty), Proper Earthing (≤2Vac between Neutral and Earth), Extension board (if needed), LAN cable 3m (1 qty)	Learning the principles of pneumatics, PLC control, and IoT integration in automated systems. Combines manual control with automated sequences using PLCs and incorporates IoT for monitoring and data acquisition.
5	Faculty of Science and Technology	School of Mechanical and Manufacturing Sciences	IOT, PLC & Manual based Hydraulic System	230V 6 Amp power supply (3 qty), 230V Single Phase 16A power socket (1 qty), Proper Earthing (≤2Vac between Neutral and Earth), Extension board (if needed), LAN cable 3m (1 qty)	Similar to the electro-pneumatic system, but uses hydraulics instead of pneumatics. Hydraulic systems are used for applications requiring higher forces and power. Learning about hydraulic principles, PLC control, and IoT integration.
6	Faculty of Science and Technology	School of Civil and Environmental Sciences	e-Builder Small	Gantry Based 3D printer; X-1000mm x Y-1000mm x Z-1000mm print volume; 3 axis; Two Interchangeable sliding pellet bed platform; +/- 0.5mm precision; 0.2mm position repeatability; 10-50mm layer resolution; 10-150mm/sec print speed; X-150mm/sec, Y-150mm/sec, Z-60mm/sec max movement speed; Hybrid Stepper Motors; Low Backlash planetary Gearbox; 25mm width Linear Guides; Racks and Pinions; Interchangeable nozzles; Screw Extruder with 10-15kg hopper capacity; Metered Pumping System; Prints Concrete/Mortar/Clay/Ceramic Paste, etc.; 1-year	Laboratory scale concrete 3D printing, prototyping, research, testing, and in-house production.

				warranty	
Sr No	**Faculty**	**Name of School**	**Instrument/ System Name**	**Specifications**	**Application**
7	Faculty of Health Sciences	School of Pharmaceutical Science	Fourier Transform Infrared Spectrophotometer (FTIR)	Wavelength range: 4000-400 cm^{-1}, Resolution: 0.5 cm^{-1}	Chemical analysis, material identification
8	Faculty of Health Sciences	School of Pharmaceutical Science	High Performance Liquid Chromatography (HPLC)	Flow rate: 0.001-10 mL/min, Pressure limit: 6000 psi	Separation, identification, and quantification of components in a mixture
9	Faculty of Health Sciences	School of Pharmaceutical Science	UV-Visible Spectrophotometer	Wavelength range: 190-1100 nm, Bandwidth: 1 nm	Quantitative analysis of solutions
10	Faculty of Health Sciences	School of Pharmaceutical Science	Dissolution Test Apparatus	Speed: 25-250 rpm, Temperature control: 25-45°C	Testing drug release from pharmaceutical dosage forms
11	Faculty of Health Sciences	School of Pharmaceutical Science	Abbe's Refractometer	Refractive index range: 1.3000-1.7000, Accuracy: ±0.0002	Measuring refractive index of liquids
12	Faculty of Health Sciences	School of Pharmaceutical Science	Colorimeter	Wavelength range: 400-700 nm, Accuracy: ±1 nm	Color measurement and analysis
13	Faculty of Health Sciences	School of Pharmaceutical Science	Polarimeter	Angle range: -180° to +180°, Accuracy: ±0.01°	Measuring optical rotation of chiral compounds
14	Faculty of Health Sciences	School of Pharmaceutical Science	Analytical Digital Balance	Capacity: 200 g, Readability: 0.0001 g	Precise weighing of small samples
15	Faculty of Health Sciences	School of Pharmaceutical Science	Brookfield Viscometer	Speed range: 0.01-250 rpm, Torque range: 0.1-100%	Measuring viscosity of fluids
16	Faculty of Health Sciences	School of Pharmaceutical Science	Biochemistry Analyzer iCHEM168	Multiple test panels, Throughput: up to 200 tests/hour	Clinical diagnostics and biochemical analysis

17	Faculty of Health Sciences	School of Pharmaceutical Science	Digital pH Cum Potential Meter	pH range: 0-14, Accuracy: ±0.01 pH	Measuring pH and potential of solutions
Sr No	**Faculty**	**Name of School**	**Instrument/ System Name**	**Specifications**	**Application**
18	Faculty of Health Sciences	School of Pharmaceutical Science	Digital Conductivity Meter	Conductivity range: 0-200 mS/cm, Accuracy: ±1%	Measuring electrical conductivity of solutions
19	Faculty of Health Sciences	School of Pharmaceutical Science	Nepheloturbidity Meter	Range: 0-1000 NTU, Accuracy: ±2%	Measuring turbidity in liquids
20	Faculty of Health Sciences	School of Pharmaceutical Science	Digital Turbidity Meter	Range: 0-1000 NTU, Resolution: 0.01 NTU	Measuring turbidity in water and other liquids
21	Faculty of Health Sciences	School of Pharmaceutical Science	Flame Photometer	Detection range: 0-1000 ppm, Accuracy: ±1%	Measuring concentration of metal ions in solutions
22	Faculty of Health Sciences	School of Pharmaceutical Science	Photo-Fluorimeter	Excitation wavelength: 250-700 nm, Emission wavelength: 280-800 nm	Fluorescence analysis of samples
23	Faculty of Health Sciences	School of Pharmaceutical Science	Digital pH meter	pH range: 0-14, Resolution: 0.01 pH	Measuring pH of solutions
24	Faculty of Health Sciences	School of Pharmaceutical Science	Sonicator	Frequency: 20 kHz, Power: 100-500 W	Cell disruption, mixing, and degassing
25	Faculty of Health Sciences	School of Pharmaceutical Science	Digital pH meter	Chemiline (Make)	Measures the pH of a solution. It is used in chemical analysis and environmental monitoring.
26	Faculty of Health Sciences	School of Pharmaceutical Science	Sonicator	Rolex (Make)	Uses ultrasonic waves to agitate a sample. It is used to disrupt cells, dissolve substances, and degas liquids.