Major Instruments in Lab No. 3 of Botany Department

Name of Instruments	Brief Description of Instruments	Image of Instruments
Lab No. 3		
Microwave-Ultraviolet-Ultrasonic Synthesis /Extraction System with Pressurised Reactor	This advanced system integrates microwave, ultraviolet (UV), and ultrasonic energy for efficient chemical synthesis and extraction processes. The combination of these energy sources enhances reaction kinetics, reduces processing time, and improves yield. The pressurized reactor allows reactions to occur at elevated temperatures and pressures, optimizing extraction efficiency for bioactive compounds, pharmaceuticals, and material synthesis. This system is widely used in green chemistry, natural product extraction, nanomaterial synthesis, and pharmaceutical development.	
Refrigerated Centrifuge	Refrigerated centrifuge is a laboratory instrument used to separate components of a mixture based on density while maintaining low temperatures to prevent sample degradation. It spins samples at high speeds with cooling to separate components by density. It is essential in biological and biochemical research, clinical diagnostics, and pharmaceutical applications, where temperature-sensitive samples such as blood, proteins, enzymes, and cell cultures require precise separation. This instrument is crucial in DNA/RNA extraction, plasma separation, and pharmaceutical formulations.	

UV-VIS Spectrophotometer	A UV-VIS spectrophotometer is an analytical instrument that measures the absorbance or transmittance of light in the ultraviolet (UV) and visible (VIS) regions of the spectrum. It is widely used for quantitative and qualitative analysis of chemical substances, determining concentration, purity, and reaction kinetics. Common applications include pharmaceutical quality control, environmental analysis (e.g., water and air pollutants), food and beverage testing, and biochemical research for protein and nucleic acid quantification.	
Potentiometric titrator	A potentiometric titrator is an automated titration system that measures the potential (voltage) of an electrode to determine the endpoint of a chemical reaction. It is highly precise and eliminates subjective errors associated with visual indicators. This instrument is commonly used in pharmaceuticals, food and beverage industries, and environmental analysis for acid-base, redox, and complexometric titrations. Applications include determining the purity of drugs, monitoring water quality, and quality control in chemical manufacturing.