Equipment and Instruments Inventory Available in the Department of Chemistry (IUST)

UV-visible spectrophotometer (Shimadzu)	
UV-visible Spectrophotometer Double Beam (Orion Thermoscientific)	
A **UV-Visible spectrophotometer** is a high-precision analytical instrument used to measure the absorbance or transmittance of light in the ultraviolet (200–400 nm) and visible (400–800 nm) regions of the electromagnetic spectrum. It is widely used in chemistry, biochemistry, environmental science, and pharmaceuticals for **quantitative and qualitative analysis** of substances.	
Fluorescence Spectrophotometer (Shimadzu)	
A **fluorescence spectrophotometer** (or spectrofluorometer) is an analytical instrument used to measure the **fluorescence intensity** emitted by a sample upon excitation with light of a specific wavelength. It is highly sensitive and suitable for detecting trace amounts of fluorescent molecules	

FTIR Spectrophotometer Shimadzu	
A **Fourier Transform Infrared (FTIR) Spectrophotometer** is an analytical instrument used to obtain an **infrared spectrum of absorption or emission** of a solid, liquid, or gas. It identifies and quantifies functional groups in organic and inorganic compounds by measuring how molecules absorb infrared light at different wavelengths	
High Performance Liquid Chromatograph (HPLC)	
A **High Performance Liquid Chromatograph (HPLC)** is a powerful analytical instrument used to **separate, identify, and quantify** components in a mixture. It operates by passing a liquid sample through a column packed with a stationary phase, using a high-pressure pump to deliver the mobile phase	

Rheometer (Anton Par)	
A **rheometer** is a scientific instrument used to measure the **rheological properties** of materials—specifically, how a substance **flows and deforms under applied forces**. It is essential for analyzing the **viscosity**, **elasticity**, and **viscoelastic behavior** of complex fluids and soft solids.	
Rotatory Vacuum Evaporator	
Rotatory Vacuum Evaporator	
A **Rotary Vacuum Evaporator** (commonly known as a **Rotavap**) is a laboratory device used for the **gentle and efficient removal of solvents** from samples by evaporation under **reduced pressure**. It is especially useful for concentrating solutions or recovering solvents	

in chemical, pharmaceutical, and biological laboratories	
Freeze Dryer	
freeze dryer, also known as a **lyophilizer**, is a laboratory or industrial device used for the **removal of water or solvents from samples through sublimation**—the process of converting ice directly into vapor under low pressure and temperature. This technique is ideal for preserving heat-sensitive biological and chemical materials	
Horizontal Laminar Air flow and BOD incubator	
A **Horizontal Laminar Air Flow Cabinet** is a contamination-control device that provides a **clean, particle-free working environment** by directing **HEPA-filtered air horizontally** across the work surface. It is primarily used in laboratories for aseptic procedures that require a **sterile and dust-free atmosphere**.	
Flame Photometer	

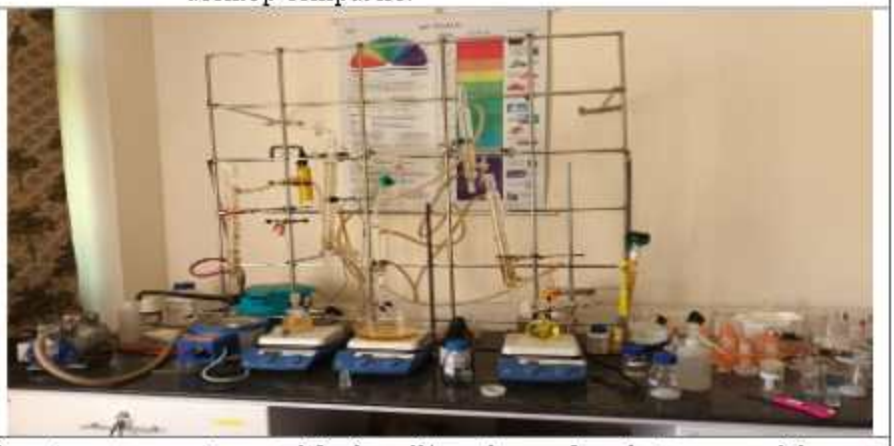
A **Flame Photometer** is an analytical instrument used to determine the **concentration of specific metal ions**—especially **alkali and alkaline earth metals** like sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), and lithium (Li^+)—in a solution. It operates on the principle that **metal ions emit light at characteristic wavelengths** when introduced into a flame.

Water and Soil Analyzer Kit

A **Water and Soil Analyzer Kit** is a portable, user-friendly analytical system designed for the **rapid testing of key chemical parameters** in water and soil samples. It is commonly used in environmental monitoring, agriculture, and field-based studies to assess **nutrient levels, contamination, and overall quality**

Brookfield viscometer

A **Brookfield Viscometer** is a widely used instrument for measuring the **viscosity** of liquids and semi-solids. It operates by determining the **torque required to rotate a spindle** at a constant speed in a fluid, which correlates directly to the fluid's resistance to flow

HPC Cluster with add Ons	
An **HPC Cluster** (High Performance Computing Cluster) is a powerful computing system that links multiple individual computers (**nodes**) to work together as a unified system for performing **complex, large-scale computational tasks**. It is designed to **process, analyze, and simulate massive datasets or intricate calculations** at high speeds, far beyond the capacity of standard desktop computers.	
Schlenk Line	
A **Schlenk Line** is a laboratory apparatus used for handling **air- and moisture-sensitive chemicals** under an **inert atmosphere** (typically nitrogen or argon) or under **vacuum**. It is essential in **synthetic chemistry**, particularly **organometallic and coordination chemistry**, where many reagents and products are highly reactive to oxygen or water	

Millipore Water Purification System	

The **Millipore Water Purification System** is a high-quality laboratory system designed to produce **ultrapure water** (Type I) and **pure water** (Type II or III) for sensitive scientific applications. Manufactured by **MilliporeSigma (part of Merck)**, these systems ensure the removal of **ions, organics, particulates, bacteria, and pyrogens** to meet strict analytical and biological requirements.

General Laboratory Instruments

- pH Meter = 13
- Conductivity Meter= 13
- Digital Balance = 06
- Magnetic Stirrer with Hot Plate = 12
- Centrifuge Machine = 02
- Melting Point Apparatus = 04
- Vacuum Pump = 03
- Potentiometer = 07
- UV-TLC Chamber = 02

Synthesis and Reaction Setup

- Rotary Evaporator = 02
- Reflux Condenser = 20
- Heating Mantle = 5
- Fume Hood = 04
- Oil Bath = 10
- Hot air oven = 05
- Muffle Furnace = 02
- Ultrasonic Bath Sonicator = 03
- Water Bath = 06