IIMT University

Central Instrumentation Lab (CIL)

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Introduction

For the purpose of advancing the boundaries of scientific and technical research, the Central Instrumentation Facility at IIMT University is home to a wide range of high-quality instruments that are of the highest specialisation. Through the utilization of these tools and resources, researchers in the fields of fundamental, applied, and medical sciences are able to undertake research that is competitive on an international international level. When it comes to testing and analysing substances and materials, the facility's cutting-edge analytical equipment offers a wide variety of analytical techniques and procedures to choose from. As a consequence of this, researchers will have an easier time publishing their findings in journals that are subject to peer review and have high impact factors. When everything is said and done, the coordinated activities of the centre will contribute to the overall improvement of society. It is also the intention of the Centre to expand its facilities on an annual basis in order to become an important centre for the nation. We believe that if we are successful in obtaining CIL, our country will be able to establish a well-known centre for creative and collaborative research in the field of analysis. It is the responsibility of the university's Division of Research and

Development to administer CIL, which is required to produce its own money in order to maintain and repair the instruments. Therefore, customers will be required to pay a little price in order to have their samples tested and analysed. This facility offers its services to a variety of entities, including academic and research institutions, universities, enterprises, and non-governmental organizations (NGOs), in addition to the stakeholders of the Indian Institute of Management University (IIMTU).

Objectives:

• To offer facilities with cutting-edge analytical equipment to speed up basic and advanced research.

• To analyse samples obtained from IIMTU and other organisations' researchers.

• To deliver accurate analytical data that can be utilised for both patenting and publishing in journals with high impact factors.

• To offer people direction and training for data collection, advanced instrument operation, and maintenance.

• To establish centres of excellence with reputable worldwide partner firms.

• To formally ratify an agreement for joint analytical research (MoU).

• To plan practical workshops, seminars, conferences, and symposia in conjunction with business and governmental partners in the field of a certain instrument.

• To offer certification courses in cutting-edge instrumentation methods.

• To provide professional advice on equipment, funding possibilities, and data interpretation (difficult data) in accordance with industry experts.

• To establish networking between research institutions on particular instruments for synergistic development.

Within the framework of CIL, a centralised lab have been developed with all the sophisticated instruments that assist researchers in publishing their findings in peer-reviewed journals with high impact factors.

Sample Analysis

Sample Analysis and the list of instruments offered by CIL and their scope is provided in Annexure-I.

1. Samples analysis will only be conducted after the requisition is received by CIL from the user. If a special approval is needed for an emergency analysis, Head CIL must suggest it, and the head of CIL will make the necessary arrangements as soon as possible.
2. Faculty members leading initiatives with outside financing will be given preference.
3. Unless otherwise stated, all samples shall be kept for a maximum of 15 days at room temperature (or, if necessary, chilled at 0-10°C).
4. After the samples are analysed, users will be contacted by phone, email, or SMS.
5. The users are also given the opportunity to analyse and evaluate data using the software that is included with the instrument. For this purpose, a separate data processing lab is set up, and all of the high-end instrument software is placed on the PCs there. Per user, a maximum of one hour of time will be allotted for a log request on a first come, first served basis. If a user misses the session due to unavoidable circumstances, they are recommended to rebook the time slot and wait for their turn.
6. CIL will be required to regularly calibrate the devices using the firms' standards in consultation with them.

Reports

1. Analysis reports containing raw data will be emailed to users or can be picked up at CIL's front desk.

2. After examination, all of the records will be kept for not more than a year.

3. Details of the analytical instrumentation, calibration curves, computed concentrations, and library data matching may be offered.

4. CIL will make careful to protect user IPR and protect the privacy of their data.

Timings:

The facility is anticipated to operate every working day (from 9 am to 5 pm). However, users can drop in their samples at the CIL office from Monday through Friday (9 am to 1 pm). The facility will observe University holidays and be closed on certain days. Saturdays are set aside for system upkeep, meetings, and activities (workshops etc.). The CIL office is open Monday through Friday from 3-5pm for users to pick up their reports.

Biosafety:

The facility will be managed in accordance with industry-standard biosafety regulations as per the guidelines of governing bodies.

Waste Disposal:

For the protection of the environment, the regulating authorities' standard waste disposal rules shall be strictly followed.

Terms and Conditions

1. The usage of the analytical services provided by the Central Instrumentation Facility (CIL), IIMT University, must be properly acknowledged in all publications of research activity (example: The services provided by the CIL, IIMTU, in the HPLC analysis are properly recognised).

2. The information in our study shall not be cited as a certificate to a third party or utilised in advertisements, litigation, or as proof.

3. Different samples have to be submitted for various analyses.

4. Materials that are unstable (or easily reactive in the environment) are not allowed for analysis (unless specifically asked). Since the study' findings depend on the stability of the material, CIL disclaims all liability for their interpretation.

5. Analyses on explosive compounds are not acceptable.

6. Sample vials must be appropriately labelled and sealed for reference.

7. The users are also expected to number the standards appropriately and indicate them wherever they need to be analysed as one of the samples.

8. Users will be assigned slots based on first come, first served. However, if a user requests several slots, the spaces will be allocated at CIL's discretion, taking into account the instruments' availability.

Annexure-I

List of instruments available at CIL.

S.No	Name of Instrument	SpeCILications	Scope
1	Microscope	nocular Microscope with camera (1.3 Megapixels) (Olympus). ɛ piece-10X, 15X, 20X. Objective lens-5X, 10X, 40X, 100X (Oil immersion lens).	Specialially designs that will enhance microscopy's capabilities and advance your research
2	Digital UV Vis Spectrophotometer (EduDAP)	Model: 118 Single Beam Digital Wavelength with 0.1 nm increments 200 – 1000 nm Range 2 nm Bandwidth Manual 4 position sample changer	UV-VIS Spectroscopy provides a simple and fast technique for qualitative and quantitative estimations covering a large number of application areas
3	Autoclave	ɡital Vertical Autoclave (120 Liter). Complete stainless steel.	*Waste is disinfected using an autoclave so that it may be securely disposed of as nonhazardous waste and become noninfectious.*
4	Incubator Shaker	Digital, Shaking Platform Size (22" × 22") Capacity (250ml to 1000ml). Speed range-20-300 rpm. Heating and cooling both functions. Temperature range- 5°C to 60°C.	It A slow, circular shaking action is characteristic of an orbital shaker (25-500 rpm). It is helpful for cleaning blots and cultivating microorganisms.
5	Bench Top Centrifuge	4000rpm.	sedimentation of suspended particles in samples is done using a centrifuge.
6	Digital Colony Counter	50 to 150 mm.	A colony counter is a device used to count bacterial or other microbe colonies that are developing on an agar plate.
7	BOD Incubator (Small)	nocular Microscope with camera (1.3 Megapixels) (Olympus). ɛ piece-10X, 15X, 20X.	To maintain temperature for test tissue culture development and preservation of

		Objective lens-5X, 10X, 40X, 100X (Oil immersion lens).	bacterial cultures, BOD Incubators (Bio-Oxygen Demand) are utilised.
8	Laminar Air Flow	ital (with wind shield). Accuracy (0.01gm to 100gm).	Microbial culture is transferred aseptically using laminar air flow. It is utilised for activities including sub-culturing, sterile medication manufacturing, inoculations, tests, and other aseptic procedures, offering a superior aseptic work station.
9	Refrigerated Centrifuge	Technical Data : C-24 Plus (Model) Max. Speed : 20000RPM Max. RCF : 37570g Max. Tube Size : 100ml Max. Capacity : 400ml Lowest Temp : – 8°C Noise : < 60 dB Supply: 220-240 Volts 50 Hz single Phase	Sedimentation of suspended particles in samples is done using a centrifuge.
10	PCR Thermal Cycler LA-949 (EduDAP)	Sample capacity: 96X0.2 ml Temp. range: 0-100°C Heating rate: 5 (°C/sec) Cooling rate: 4 (°C/sec) Control accuracy: ±0.1 Grading temp range: 30-100°C	The polymerase chain reaction is a technique that amplifies DNA and RNA materials using thermocyclers, also known as thermal cyclers.
11	BOD Incubator/ Cooling Incubator (EduDAP)	CI-10 plus Temp. range : 0-60 °C Adjustable 3 no. trays CLS (custom logical safe) control system with logical safety devices	To maintain temperature for test tissue culture development and preservation of bacterial cultures, BOD Incubators (Bio-Oxygen Demand) are utilised.
12	Universal Combined Kjeldhal Digestion and Distillation Unit (EduDAP)	consisting of a single, electrically heated MS tubular stand with two shelves and a glass fume duct. One heater box outfitted with a 500 watt heater and separate energy regulators in the distillation and digesting parts,	The Kjeldahl unit is made to measure the concentration of nitrogen, ammonia, and proteins. It consists of a single piece of equipment with a digestive and distillation unit.

		respectively, on the top and lower sides. Additionally, a brass condenser rack with water circulation mechanisms and clamps is provided for the distillation section..	
13	Rotary Microtome (ERBA Type) (EduDAP)	Feed adjustment: 1 - 25 micron Minimum Thickness - 1micron Total Feed Excursions - 28 micron	It is a widely used, dependable, and contemporary sectioning tool for tissues with a thickness of up to one micrometre.
14	Ultrasonic Probe Sonicator (EduDAP)	Probe Sonicator Labman, Model PRO650Salient Features : Touchscreen display - 4.3 inches TFT Technical Data : Frequency : 20-25KHz - Automatic tracking Process capacity : 0.5-500ml (approx.) Probe Dia (Titanium Alloy) Standard : 6mm (1/4") Display Function : Temperature, Power, Time, etc. Temperature range(°C) : 0-99°C Timer (Selectable) : Yes Overload Protection :Yes Input method : Touch screen control, Data Memory : 20 groups Output Power : 6.5-650W (adjustable)	In the lab, sonication is frequently employed to spread nanotubes throughout the polymer matrix. It is used in emulsification study
15	Auto analyzer (EduDAP)	Auto Universal Titrator Make Systronics, Model No. 354- with Graphic LCD (Potentiometric / K.F. / pH / mV / Temp.)	An automated analyser is a piece of equipment used in medical labs to swiftly and with little help from humans measure various chemicals and other properties in a variety of biological samples.
16	Cell analyzer Cat.No. H-33S (EduDAP)	Counting time (sec): 10-30 Cell concentration range, cells/ml: 5 x 104–1 x 107 Optimal cell concentration range, cells/ml :1 x 105–5 x 106	Hematology analyzers are used to determine the total number of blood cells, identify blood cell illnesses, and keep track of the patient's health.

		Cell diameter range, µm: 6–50 Sample volume, µl: 10 Data storage, counts: 100 Printer connectivity: Yes Dilution calculator: Yes Image of cells available: Yes	
17	**HPLC** High-Performance Liquid Chromatography (HPLC) is an advanced form of liquid chromatography used to separate, identify, and quantify components **in a** mixture. It relies on a liquid mobile phase that carries the sample through a stationary phase (packed column) under high pressure	• Model: LI-6200 • Pump Type: Dual-piston reciprocating pump • Flow Rate Range: 0.01 to 10.00 mL/min • Pressure Limit: Up to 6000 psi (or ~400 bar) • Detector Options: UV-Vis detector (190-600 nm), optional RID, or PDA • Injection Volume: Variable, typically 1-100 µL • Precision: High flow rate precision (<0.1% RSD) • Control System: Microprocessor-based. • Communication: RS232 or USB for software control. Software: Compatible with chromatographic data analysis software.	pharmaceutical research, environmental monitoring, and food safety analysis.
18	**Double beam UV Vis Spectrophotometer**	• Model: LMSP-UV1900 • Double Beam • Wavelength Range: 190-1100 nm	quantifying biomolecules, analyzing organic and inorganic compounds, and detecting impurities

		• Spectral Bandwidth: 1.0 nm • Wavelength Accuracy: ±0.3 nm • Wavelength Repeatability: ±0.1 nm • Photometric Range: -0.3 to 3.0 Abs • Light Source: Deuterium (UV) & Tungsten Halogen (Visible) lamps • Detector: Silicon photodiode • Scanning Speed: Fast scanning (up to 4000 nm/min) • Display: High-resolution LCD/Touchscreen • Data Output: USB, RS232, and printer compatibility □ Applications: Quantitative analysis, wavelength scanning, kinetics, and multi-wavelength testing	
19	**ELISA Micro Plate Reader**	• Model: RT-600 Microplate Reader • Measurement Range: 0.000–4.000 Abs (Absorbance) • Wavelength Range: 400–750 nm • Filters: Standard: 405, 450, 492, 630	allows for the detection and quantification of various substances, including antigens, antibodies, proteins, and nucleic acids.

		nm (optional filters available) • Accuracy: ±0.005 Abs (0.000–1.000 Abs) • Precision: ≤0.2% • Light Source: LED with long lifespan • Microplate Compatibility: 96-well plates • Reading Speed: <5 seconds per 96 wells • Display: LCD screen for data visualization • Data Output: USB and RS232 for data export • Software: Built-in or PC-compatible software for analysis Applications: ELISA assays, protein quantification, and enzyme activity studies	
20	**Gel Electrophoresis (Vertical& Horizontal)**	• Model: Vertical Gel Electrophoresis System • Dimensions (lwh) 150x180x150 mm • Gel size (max) 70x50 mm • Buffer required 200 ml • Electrodes Platinum • Combs - Teflon 5 well, 1.0 mm thick Spacers - Acrylic 1.0 mm	For Analysis of Protein and DNA Samples

List of instruments available at CIL and the Analysis Cost

S.No	Name of Instrument	Specification's	Analysis cost
1	Microscope	nocular Microscope with camera (1.3 Megapixels) (Olympus). e piece-10X, 15X, 20X. Objective lens-5X, 10X, 40X, 100X (Oil immersion lens).	Rs. 50 per sample
2	Digital UV Vis Spectrophotometer (EduDAP)	Model: 118 Single Beam Digital Wavelength with 0.1 nm increments 200 – 1000 nm Range 2 nm Bandwidth Manual 4 position sample changer	Rs. 100 per sample
3	Autoclave	gital Vertical Autoclave (120 Liter). Complete stainless steel.	Rs. 300 per Kg
4	Incubator Shaker	Digital, Shaking Platform Size (22" × 22") Capacity (250ml to 1000ml). Speed range-20-300 rpm. Heating and cooling both functions. Temperature range- 5°C to 60°C.	Rs. 100/ day/ sample
5	Bench Top Centrifuge	4000rpm.	Rs. 50 per sample
6	Digital Colony Counter	50 to 150 mm.	Rs. 50 per sample
7	BOD Incubator (Small)	nocular Microscope with camera (1.3 Megapixels) (Olympus). e piece-10X, 15X, 20X. Objective lens-5X, 10X, 40X, 100X (Oil immersion lens).	Rs. 100/ day/ sample
8	Laminar Air Flow	gital (with wind shield). Accuracy (0.01gm to 100gm).	Rs. 100/ day/ sample
9	Refrigerated Centrifuge	Technical Data : C-24 Plus (Model) Max. Speed : 20000RPM Max. RCF : 37570g Max. Tube Size : 100ml Max. Capacity : 400ml Lowest Temp : – 8°C Noise : < 60 dB Supply: 220-240 Volts 50 Hz single Phase	Rs. 100 per sample
10	PCR Thermal Cycler LA-949 (EduDAP)	Sample capacity: 96X0.2 ml Temp. range: 0-100°C Heating rate: 5 (°C/sec) Cooling rate: 4 (°C/sec) Control accuracy: ±0.1	Rs. 500/ sample

		Grading temp range: 30-100°C	
11	BOD Incubator/ Cooling Incubator (EduDAP)	CI-10 plus Temp. range : 0-60 °C Adjustable 3 no. trays CLS (custom logical safe) control system with logical safety devices	Rs. 100 per sample
12	Universal Combined Kjeldhal Digestion and Distillation Unit (EduDAP)	consisting of a single, electrically heated MS tubular stand with two shelves and a glass fume duct. One heater box outfitted with a 500 watt heater and separate energy regulators in the distillation and digesting parts, respectively, on the top and lower sides. Additionally, a brass condenser rack with water circulation mechanisms and clamps is provided for the distillation section..	Rs. 200 per sample
13	Rotary Microtome (ERBA Type) (EduDAP)	Feed adjustment: 1 - 25 micron Minimum Thickness - 1micron Total Feed Excursions - 28 micron	Rs. 100 per sample
14	Ultrasonic Probe Sonicator (EduDAP)	Probe Sonicator Labman, Model PRO650Salient Features : Touchscreen display - 4.3 inches TFT Technical Data : Frequency : 20-25KHz - Automatic tracking Process capacity : 0.5-500ml (approx.) Probe Dia (Titanium Alloy) Standard : 6mm (1/4") Display Function : Temperature, Power, Time, etc. Temperature range(°C) : 0-99°C Timer (Selectable) : Yes Overload Protection :Yes Input method : Touch screen control, Data Memory : 20 groups Output Power : 6.5-650W (adjustable)	Rs. 150 per sample
15	**HPLC** **High-Performance Liquid Chromatography (HPLC)** is an advanced form of liquid chromatography used to **separate, identify, and**	• Model: LI-6200 • Pump Type: Dual-piston reciprocating pump • Flow Rate Range: 0.01 to 10.00 mL/min • Pressure Limit: Up to 6000 psi (or ~400 bar) • Detector Options: UV-Vis detector (190-600 nm), optional RID, or PDA	Rs. 1500 per sample

	quantify components in a mixture. It relies on a liquid mobile phase that carries the sample through a stationary phase (packed column) under **high pressure**	• Injection Volume: Variable, typically 1-100 µL • Precision: High flow rate precision (<0.1% RSD) • Control System: Microprocessor-based. • Communication: RS232 or USB for software control. Software: Compatible with chromatographic data analysis software.	
16	**Double beam UV Vis Spectrophotometer**	• Model: LMSP-UV1900 • Double Beam • Wavelength Range: 190-1100 nm • Spectral Bandwidth: 1.0 nm • Wavelength Accuracy: ±0.3 nm • Wavelength Repeatability: ±0.1 nm • Photometric Range: -0.3 to 3.0 Abs • Light Source: Deuterium (UV) & Tungsten Halogen (Visible) lamps • Detector: Silicon photodiode • Scanning Speed: Fast scanning (up to 4000 nm/min) • Display: High-resolution LCD/Touchscreen • Data Output: USB, RS232, and printer compatibility □ Applications: Quantitative analysis, wavelength scanning, kinetics, and multi-wavelength testing	Rs. 150 per sample
17	**ELISA Micro Plate Reader**	• Model: RT-600 Microplate Reader • Measurement Range: 0.000–4.000 Abs (Absorbance) • Wavelength Range: 400–750 nm • Filters: Standard: 405, 450, 492, 630 nm (optional filters available) • Accuracy: ±0.005 Abs (0.000–1.000 Abs)	Rs. 400 per plate

		• Precision: ≤0.2% • Light Source: LED with long lifespan • Microplate Compatibility: 96-well plates • Reading Speed: <5 seconds per 96 wells • Display: LCD screen for data visualization • Data Output: USB and RS232 for data export • Software: Built-in or PC-compatible software for analysis Applications: ELISA assays, protein quantification, and enzyme activity studies	
18	**Gel Electrophoresis (Vertical& Horizontal)**	• Model: Vertical Gel Electrophoresis System • Dimensions (lwh) 150x180x150 mm • Gel size (max) 70x50 mm • Buffer required 200 ml • Electrodes Platinum • Combs - Teflon 5 well, 1.0 mm thick Spacers - Acrylic 1.0 mm	Rs 500 per sample