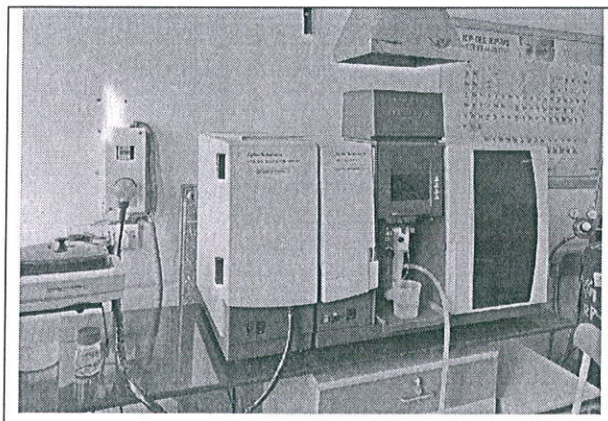
POLICY FOR CENTRAL RESEARCH FACILITY (CRF), NU

Research is the cornerstone of academic progress, and the proposed facility will be equipped with state-of-the-art resources from our existing labs which are housed in the different departments of NIIT University. This will foster an environment conducive to research in various disciplines. This facility will be accessible to undergraduate, postgraduate, and doctoral students, as well as faculty members. This inclusivity ensures that all members of our academic community have equal opportunities to engage in meaningful research. Students and faculty members will benefit from the resources and collaborative opportunities offered by the facility. It will enable them to pursue cutting-edge research projects, secure external funding, and publish in high-impact journals, thus contributing to the academic prestige of our university.

We have identified the following equipment from different labs of our University to include in the Central Research Facility and want to label these equipment as CRF_lab name_number. A brief description of each equipment is given below:

Equipment in BT&BI Lab:

 CRF_BT&BI_01	**An Atomic Absorption Spectrophotometer (AAS)** is a scientific instrument used to analyze the concentration of metals in a sample. It measures the absorption of light by free atoms or ions when they are in a ground state. This technique is commonly used in various fields such as environmental science, me dicine, and metallurgy for elemental analysis.

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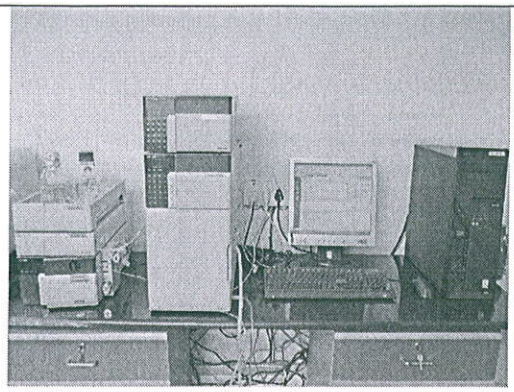
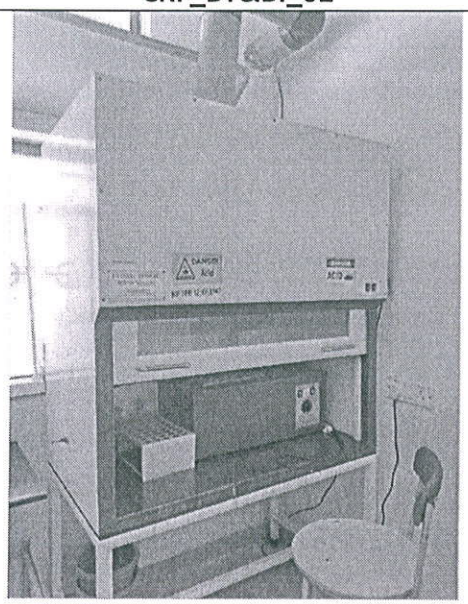
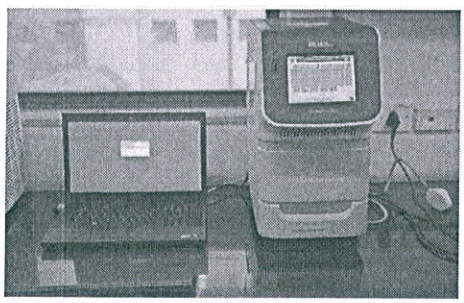
 **CRF_BT&BI_02**	**High Performance Liquid Chromatography (HPLC)** is a powerful analytical technique used to separate, identify, and quantify components in a mixture. It's commonly employed in pharmaceuticals, environmental analysis, food and beverage testing, and various other fields where precise separation and analysis of compounds are required.
 **CRF_BT&BI_03**	**A fume hood** is a ventilation system designed to limit exposure to hazardous or toxic fumes, vapors, or dusts. It is commonly used in laboratories to protect personnel and the environment from potentially harmful substances during experiments or procedures.
 **CRF_BT&BI_04**	**An RT-PCR (Reverse Transcription Polymerase Chain Reaction)** machine is used to amplify and detect specific RNA sequences, allowing for the identification and quantification of RNA molecules, such as those from viruses like SARS-CoV-2, making it essential in diagnosing infectious diseases, genetic research, and various applications in molecular biology.

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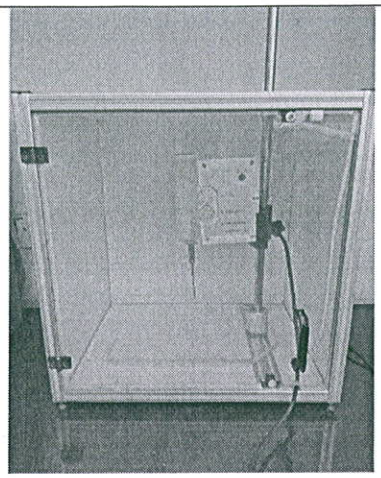
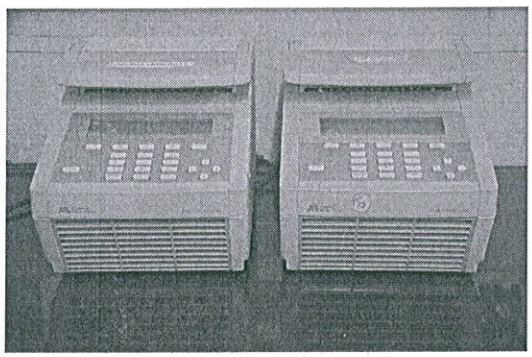
 **CRF_BT&BI_05**	**An ultrasonicator machine** is used to apply ultrasonic waves to samples for various purposes such as cell disruption, homogenization, emulsification, and dispersion. It helps in breaking down particles or cells into smaller sizes through the application of high-frequency sound waves.
 **CRF_BT&BI_06**	**A PCR (Polymerase Chain Reaction) machine or thermal cycler** is used to amplify small amounts of DNA, making it possible to produce millions of copies of a specific DNA sequence for analysis. It's a fundamental tool in molecular biology for various applications like genetic testing, DNA sequencing, and forensic analysis.
 **CRF_BT&BI_07**	**A lyophilizer machine, also known as a freeze dryer,** is used to remove moisture from substances while preserving their structure. It's commonly used in pharmaceuticals, food preservation, and research to extend shelf life, maintain potency, and facilitate storage.

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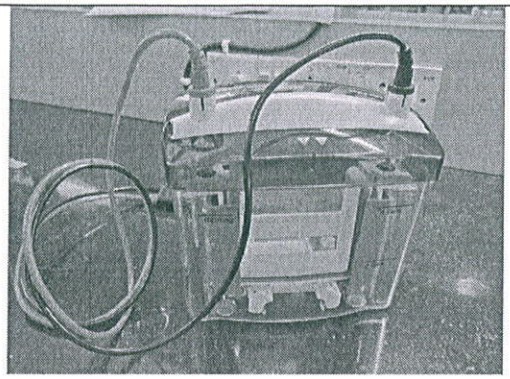
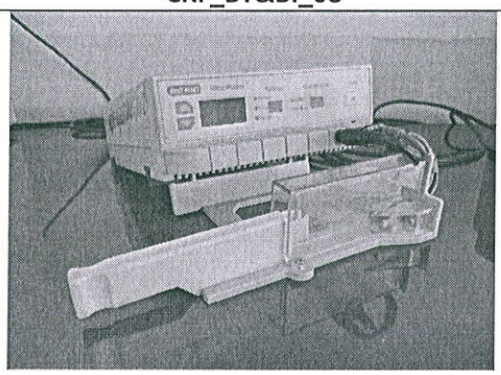
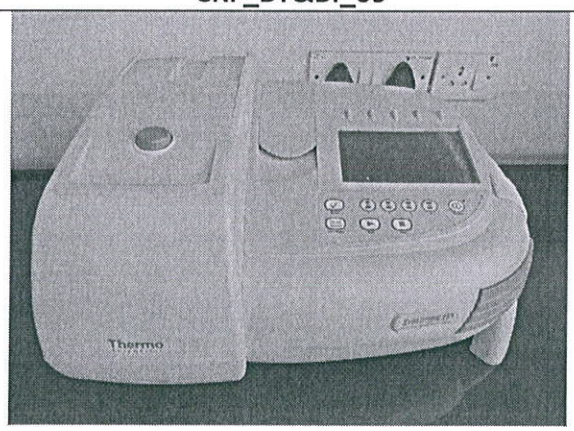
 CRF_BT&BI_08	**Polyacrylamide gel electrophoresis (PAGE)** is a technique used in biochemistry, molecular biology, and related fields to separate biomolecules such as DNA, RNA, and proteins according to their size and charge. In PAGE, a sample is loaded onto a gel matrix made of polyacrylamide, and an electric field is applied.
 CRF_BT&BI_09	**An electroporator machine** is used to facilitate the process of electroporation, which involves the application of electrical pulses to create temporary pores in cell membranes, allowing for the introduction of substances such as DNA, RNA, or other molecules into cells. This technique is commonly employed in molecular biology and biotechnology for various applications such as genetic transformation and drug delivery.
 CRF_BT&BI_10	**A spectrophotometer** is a scientific instrument used to measure how much a substance absorbs or transmits light at different wavelengths. It's commonly used in chemistry, biology, and physics for tasks like analyzing the concentration of a substance in a solution, determining the purity of a compound, or studying the properties of materials.

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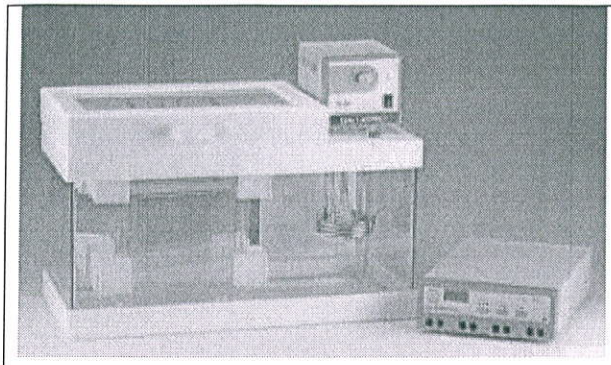
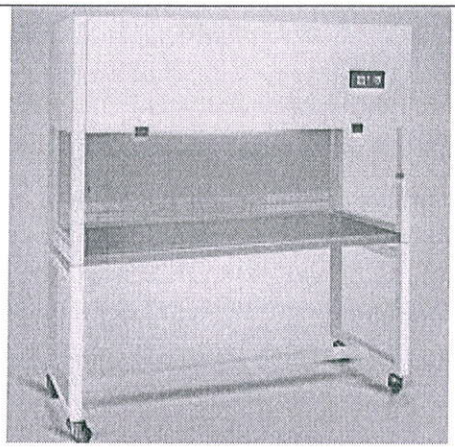
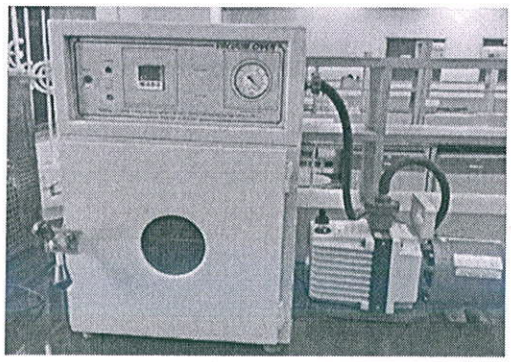
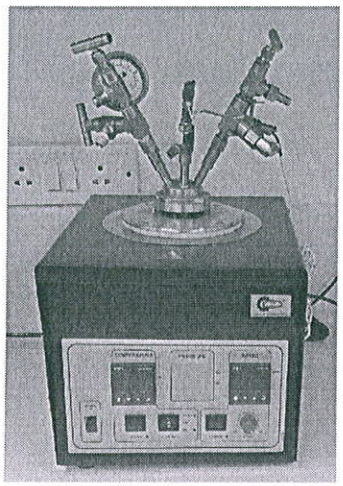
 CRF_BT&BI_11	**Denaturing Gradient Gel Electrophoresis (DGGE)** is a molecular biology technique used to analyze and separate DNA fragments based on their sequence differences. It's particularly useful for studying microbial communities and identifying genetic variations within populations.
 CRF_BT&BI_12	**A laminar hood**, also known as a laminar flow hood or clean bench, is a type of enclosed workspace used in laboratories, hospitals, and other settings to provide a sterile environment for working with sensitive materials or conducting experiments that require a controlled airflow to minimize contamination. It uses HEPA (High-Efficiency Particulate Air) filters to create a laminar flow of filtered air, which helps to maintain a sterile environment by directing airborne particles away from the work area.

Equipment in Chemistry Lab:

 CRF_CHE_01 High Vacuum Oven	**Vacuum Oven** A vacuum oven is a type of vacuum oven that can reach temperatures of up to 350°C (662°F). Vacuum ovens are used to dry heat-sensitive materials like powders by removing moisture and volatile substances at lower temperatures. They can also be used for: Determining moisture content, Dry sterilization, Purification, Out gassing of solids, Removing bubbles, Curing epoxies,

	Baking-out, Degassing liquids, Aging tests, and Heat treating.



CRF_CHE_02 High-Pressure Reactor

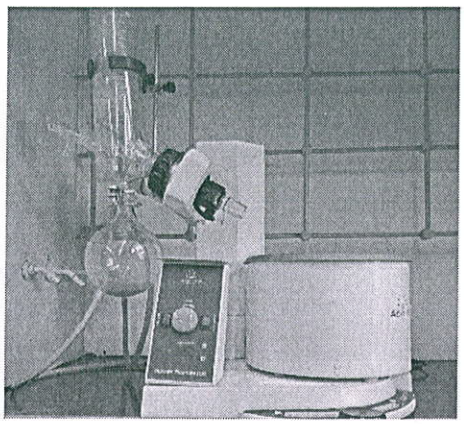
High-Pressure Reactor

A high-pressure reactor is a container that holds contents at high pressure while they undergo chemical reactions. They are used in both lab-scale and industrial syntheses.

CRF_CHE_03 Muffle Furnace

Muffle Furnace

A muffle furnace, also known as a retort furnace, is a laboratory instrument that heats materials to high temperatures while isolating them from the fuel and combustion byproducts. Muffle furnaces are used in many industries, including glass manufacturing, metalworking, and cement making. They are also used by scientists to determine the amount of non-combustible and non-volatile content in a sample.

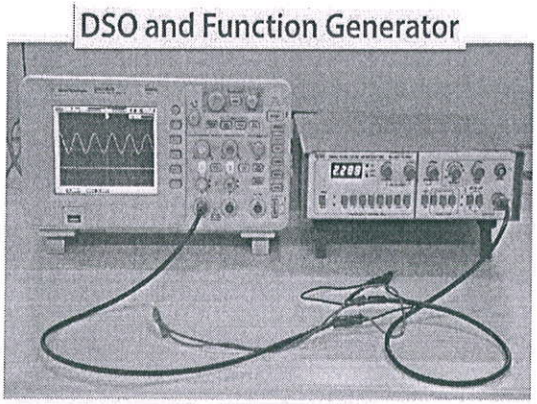


CRF_CHE_04 Rotary Evaporator

Rotary Evaporator

A rotary evaporator, also known as a "rotovap", is a device used in chemical laboratories to remove solvents from samples through evaporation. The process is one of the most common methods of solvent evaporation because of its optimal extraction and distillation performance.

Equipment in ECE lab:



CRF_ECE_01

DSO : A **digital storage oscilloscope (DSO)** is an oscilloscope which stores and analyses the input signal digitally rather than using analog techniques

Function Generator : **Function generator** is usually a piece of electronic test equipment or software used to generate different types of electrical waveforms over a wide range of frequencies. Some of the most common waveforms produced by the function generator are the sine wave, square wave, triangular wave and sawtooth shapes.

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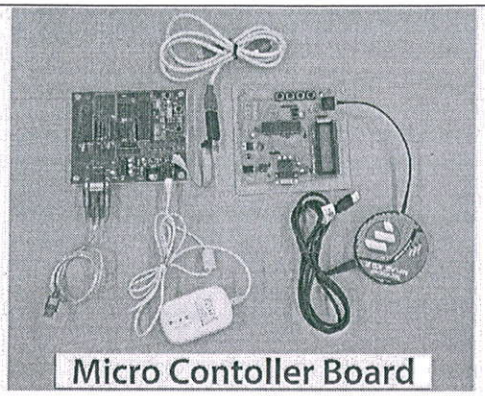
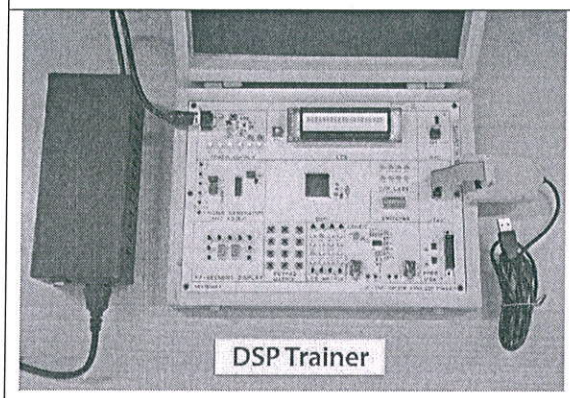
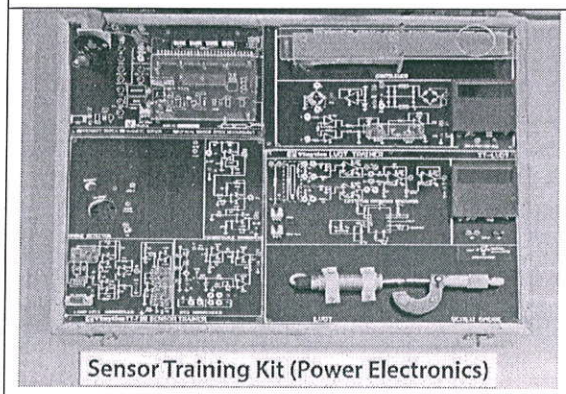
 CRF_ECE_02	**PIC16F877A based development Board** *Designed*, Developed, and Fabricated at NIIT University Workshop practice Lab for control and IOT related projects.
 CRF_ECE_03	**The DSP development board** is a Low-power digital signal processor based on C674x DSP core. It consumes significantly lower power than other members of the TMS320C6000™ Platform of DSP's. The C6745/6747 DSP core uses a two-level cache-based architecture. The C67xx Evaluation Board is a highly integrated, high-performance solution for demanding control applications and is the first 32-bit 150 MIPS DSP.
 CRF_ECE_04	**Sensor training kit** is designed to offer hands on experience to users about the various digital sensors which are used in the industrial automation sector.Various equipment such as power distribution box, patch chords, counter, vernier, digital multi meter are provided to measure the efficiency of the sensors

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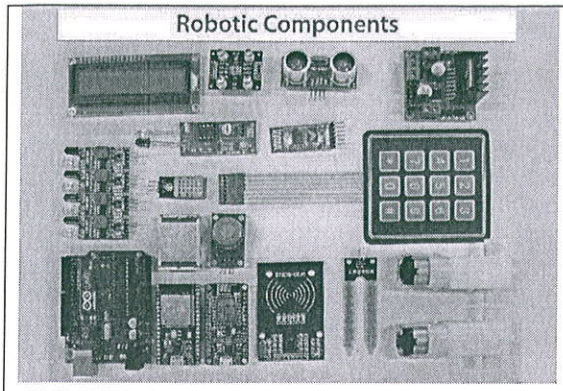
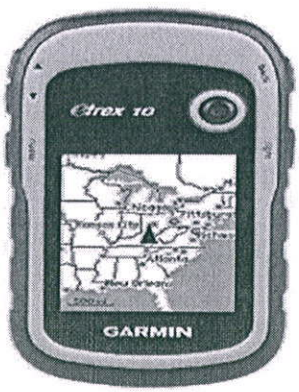
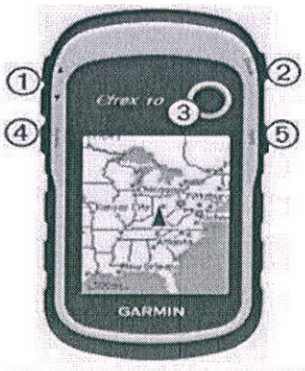
 CRF_ECE_05	The **Arduino Sensor Kit** is made for Makers who have just started using Arduino to explore the vast space of electronics and programming. This kit teaches how to connect and program basic Grove modules that includes both sensors and actuators.

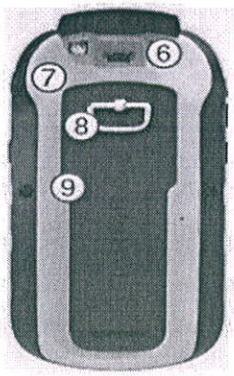
Equipment in GIS lab:

GARMIN GPS (Ctrex 10) [Handheld GPS]

The etrex® 10 (or Garmin Oregon ® 600t) allows for the transfer of waypoint and track data between the GPS and the computer. This function can be used to transfer downloaded waypoints and tracks onto the GPS. For example, the location of a geocache can be uploaded onto the GPS as a waypoint.







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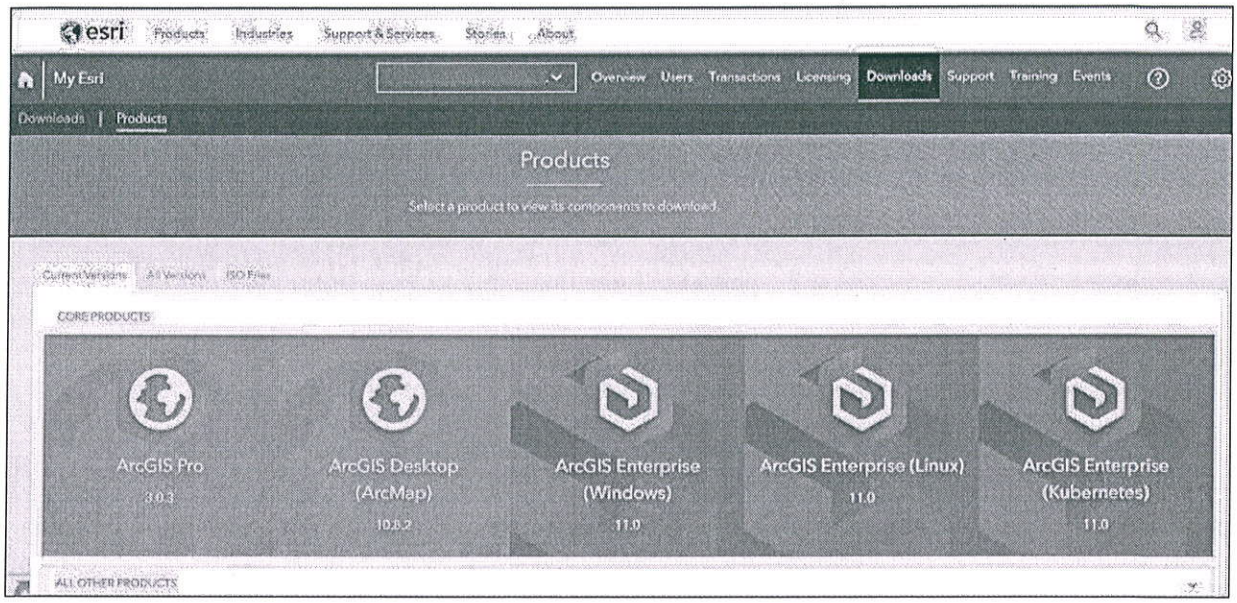
ARCGIS Pro

ArcGIS offers unique capabilities and flexible licensing for applying location-based analytics to your business practices. Gain greater insights using contextual tools to visualize and analyze your data. Collaborate and share via maps, apps, dashboards and reports.



We have also identified the following faculty members for smooth functioning of the Central Research Facility.

1.Dr. Utkarsh Raj (Biotechnology)

2. Dr. Thota Sivasankar (GIS)

3. Mr. Jetendra Joshi (ECE)

4. Dr. Vivek Shrivastava (Chemistry)

To process further, we need to keep the record of utilization of the facility. The SOP and the form for requesting to use the ULRF is attached below.

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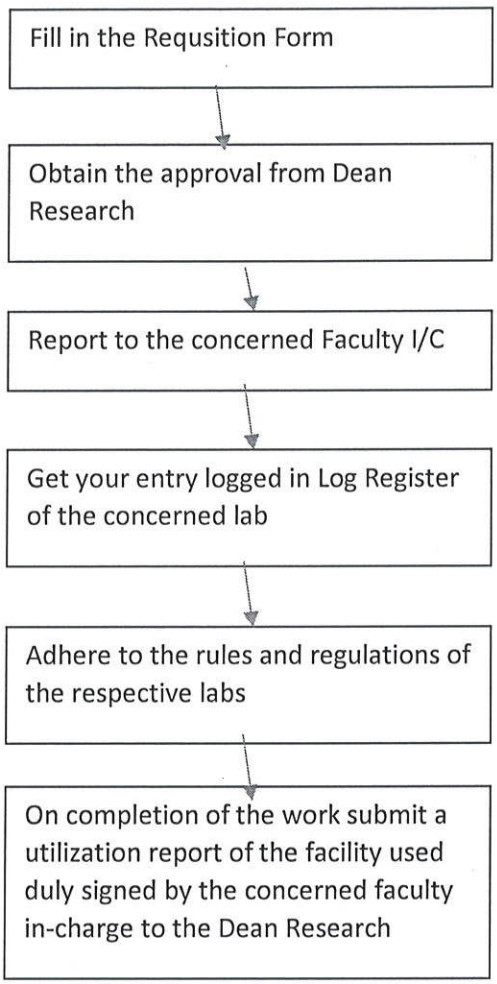
SOP of Central Research Facility



Step I: Fill in the Requsition Form

Step II: Obtain the approval from Dean Research

Step III: Report to the concerned Faculty I/C

Step IV: Get your entry logged in Log Register of the concerned lab

Step V: Adhere to the rules and regulations of the respective labs while working in the lab.

Step VI: On completion of the work submit a utilization report of the facility used duly signed by the concerned faculty in-charge to the Dean Research.

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Dean Research Office, NIIT University

Request to grant permission to use "University Level Research Facility"

Name _____ **Area** _____

Email ID _____ Contact No_____

Name of the facility required:

Purpose:

Duration:

From.....To.....

Signature

Dean Research's comments and signature

Faculty In-Charge's comments and signature