

## **The Department of Botany Deen Dayal Upadhyaya College Research Lab Facilities and Equipments**

The Department of Botany endeavors to promote and inspire students to pursue higher studies in plant sciences, orienting them towards learning and investigation. The department has well-equipped laboratories to carry out practical classes and research work, a museum and a botanical garden. The Department of Botany at Deen Dayal Upadhyaya College does have two labs, one research Lab and one Museum which are equipped with avant grade instruments and can be compared with any research lab and department provides them the stepping stone to reach higher heights in their careers. A unique feature of the department is its faculty members which include experts and active researchers from almost all areas of plant science. They publish quality research work in reputed national and international journals. The faculty members initiate innovative projects with the active involvement of students to instigate scientific temperament in them. Students are encouraged to enthusiastically participate in all the activities of the department throughout the year, thereby constantly evolving them as vibrant personalities. The sustained efforts of teachers bring students closer to Mother Nature through botanical excursions. Founded with a vision to empower our students in various upcoming thrust areas of basic and applied sciences viz. microbiology, plant biotechnology, molecular biology, bioinformatics etc.,



**Botany Laboratory – I**



**Botany Laboratory - II**



**BOTANY RESEARCH LABORATORY**



**BOTANY MUSEUM CUM LAB**

The facilities in various labs includes PCR, -20 C, Plant Growth Chamber, Kjeldahl Unit, Soxhlet Extraction Unit, Rotary Flask shaker, Autoclave, Gel Imaging workstation, Centrifuge, Glass distillation Unit, Spectrophotometer, Microtome, BOD incubator, Hot Air Oven.



**Hot Air Oven**



**PCR Unit**



**GEL Image Workstation**



**Autoclave**



**Cryocan**



**PCR Unit**



**Centrifuge**



**Water Bath**



**Microscope**



**Distillation Unit**



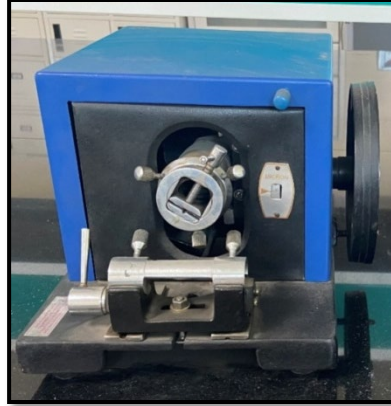
**Kjeldahl Digestion-Distillation Unit**



**Spectrophotometer**



Hot Air Oven



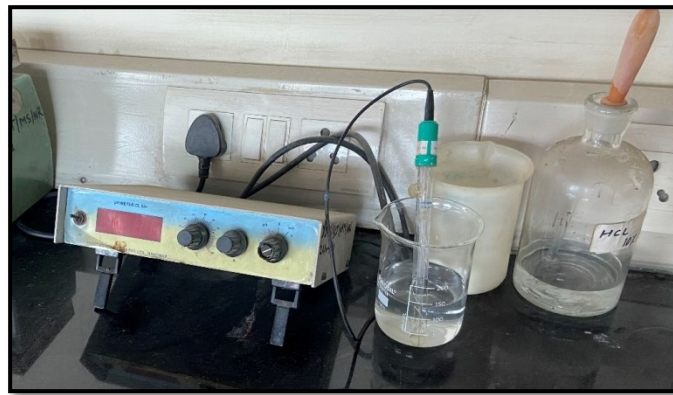
Microtone



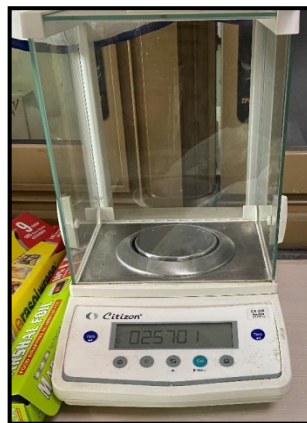
Digital Photo Colorimeter



Rotary Flask Shaker



pH Probe Meter



Magnetic Stirrer

Digital Micro Weighing Balance

Digital Weighing Scale

## FACILITIES IN RESEARCH LABS

### 1. Room No. 205

1. Autoclave
2. Digital photo colorimeter
3. Laminar Air flow
4. Plant growth Chamber
5. Spectrophotometer
6. Water Bath
7. Weighing Balance

### 2. Room No. 217

1. (-) 20 C
2. BOD incubator
3. Centrifuge
4. Gel Imaging workstation
5. Glass distillation Unit
6. Hot Air Oven
7. Kjeldahl Unit
8. Microtome
9. PCR
10. Rotary Flask shaker
11. Soxhlet Extraction Unit
12. Spectrophotometer
13. Water Bath
14. Cryocan
15. Refrigerated water Bath
16. Magnetic stirrer
17. Autoclave

### Facilities these different instruments provides:

- **Plant growth chamber** : A plant growth chamber provides a controlled environment in which plants can exist. These chambers make it possible to measure the effects of various environmental characteristics, such as light, temperature, humidity, and other atmospheric conditions, on plant growth and function. These chambers are used in biotechnology, seed

germination, agricultural research, and the development of products and organisms. In addition, plant growth incubators are used for standard plant production.

- **Minus 20 freezer (-20C to -40C Freezers):** In laboratory and clinical environments, it is important to keep perishable samples at a consistent temperature well below freezing. Minus 20 degrees Celsius is a commonly accepted baseline temperature at which to store perishable, flammable, or hazardous material, and so the freezers listed below for the most part reach -20 °C. Some freezers have -20 °C as their only setting, while other freezers are capable of different temperature ranges from -13 °C to -40 °C. Operation voltages range from 115 to 230 V, depending on temperature range and sample capacity. A minus 20 freezer can have an under-counter, chest or upright orientation. Various proprietary foam insulation types provide good Energy Star ratings, and manual defrost systems with special thawing tubes help protect against thaws and dehydration.
- **Kjeldahl Unit** – This unit is designed to determine protein, nitrogen and ammonia content from plant and soil samples. It is a single equipment combined with digestion and distillation unit fitted in single metallic frame. Each unit has 6 heating mantles with individual energy regulators, supporting rods and clamps and a fume duct.
- **Soxhlet Extraction Unit** – This unit is a fully automated system for fast and safe extraction. This unit process ensures intimate contact of the sample matrix with the extraction solvent. This method is applicable to the isolation and concentration of water-insoluble and slightly water-soluble organics in preparation for a variety of chromatographic procedures.
- **Rotary Flask shaker** – This shaker is ideal for mixing and development of cultures, chemicals, solvents, etc. and for production of basic chemicals, pathological work, and various other applications.
- **Autoclave** – This is used to decontaminate certain biologicals waste and sterilize media, instruments and lab ware. Regulated medical waste that might contain bacteria, viruses and other biological material are recommended to be inactivated by autoclaving before disposal.
- **Gel Imaging workstation** – This is used to record and measure labeled nucleic acid and protein in various types of media such as agarose, acrylamide or cellulose.
- **Centrifuge** – This is used in various laboratories to separate fluids, gases, or liquids based on density. In research and clinical laboratories centrifuge is often used for cell, organelle, virus, protein, and nucleic acid purification.



- **Glass distillation Unit** – This unit is used for separating mixtures based on differences in volatilities of compounds in a boiling liquid mixture. Instead of removing contaminants from water sample, a distiller reverses the equation and removes the water from the contaminants.
- **Spectrophotometer** – This machine is used to quantify concentrations of compounds, determination of the structure of a compound, finding functional groups in chemicals, to determine the molecular weight of compounds.
- **PCR unit** – This machine is used for replications of DNA, detecting DNA sequences, carrying out DNA fingerprinting, forensic analysis and molecular cloning.
- **Microtome** – This is a cutting tool used to produce extremely thin sections of material/specimens.
- **BOD incubator** – This unit is useful for determining levels of organic matter and nitrogen in waste samples. This incubator is also used to provide the required temperature for the growth of microorganisms and allows to perform the BOD testing. This unit has an orbital shaker also.
- **Hot Air Oven** – This is used for sterilizing the samples, chemicals. This is also used to heat a sample at a particular temperature.

Dr Reeta Kumari  
 Teacher-In Charge  
 Assistant Professor  
 Department of Botany