Civil Engineering Department- Laboratories

The Civil Engineering Department of Gautam Buddha University, Greater Noida has the following laboratories:

1. CAD Lab
2. Surveying Lab
3. (a) Environmental Engineering Lab
   (b) Advanced Environmental Engineering Lab
4. Geotechnical Lab
5. Fluid Mechanics Lab
6. Hydraulic Mechine Lab
7. Transportation Engineering Lab
8. Structural Engineering Lab
9. Concrete Technology Lab
10. Material Testing Lab

Description

1. CAD Lab

The CAD (Computer-Aided Design) lab is a cutting-edge facility at our institution, dedicated to advancing students' proficiency in digital design and drafting. Equipped with powerful CAD software, this lab provides hands-on experience in creating detailed 2D and 3D models for various engineering and architectural projects. Under the guidance of skilled instructors, students learn to use CAD tools effectively, understand design principles, and develop the ability to transform concepts into precise technical drawings. The CAD lab fosters creativity and problem-solving skills, empowering students to excel in the ever-evolving fields of design and engineering.

2. Surveying Lab

The Surveying lab is an integral part of our academic curriculum, designed to impart practical skills and knowledge in land surveying and geospatial data collection. Equipped with advanced surveying instruments like total stations, GPS devices, and theodolites, students gain hands-on experience in measuring distances, angles, and elevations. In this lab, they learn to conduct precise topographic and boundary surveys, enhancing their understanding of land development and construction projects. The Surveying lab plays a crucial role in preparing students for careers in civil engineering, land management, and geospatial sciences by providing them with essential fieldwork experience and data analysis skills.

3. (a) Environmental Engineering Lab

The Environmental Engineering Lab is a pivotal facility dedicated to addressing pressing environmental challenges. Equipped with advanced instruments and testing equipment, students engage in hands-on experiments to analyze water and air quality, wastewater treatment processes, and environmental impact assessments. This lab enables students to gain practical insights into designing sustainable solutions for pollution control, resource

management, and environmental preservation. By conducting experiments and projects, students not only deepen their understanding of environmental engineering principles but also develop the skills required to contribute to a cleaner and more sustainable future. The Environmental Engineering Lab plays a critical role in preparing students for careers in environmental engineering, resource management, and sustainability consultancy.

(b) Advanced Environmental Engineering Lab

The objective of Advanced Environmental Engineering Laboratory is to expose the students about the advancements in the area of waste treatment with emphasis on domestic liquid waste, its treatment and disposal at industrial level to community level. To understand and interpret the weather data. To make student aware about sewage treatment plant and use of different software for the same. Upon successful completion of this course, it is expected that students will be able to: Determine phosphates; oil and grease in waste water used for industrial and rural applications; interpret the weather data; Determine soil pH, conductivity, cat ions exchange capacity etc and the heavy metals.

4. Geotechnical Lab

Our laboratory is a hub of learning and research, where we delve into the intricate behaviour of soils and their significance in civil engineering. Soil mechanics is a cornerstone of geotechnical engineering, focusing on the mechanical properties of soils and their interaction with structures. This knowledge is vital for designing stable foundations, embankments, tunnels, and other infrastructure projects.

At GBU's Soil Mechanics Laboratory, we boast a comprehensive array of advanced testing equipment and instruments. Our facility includes triaxial testing machines, consolidation apparatus, direct shear testers, and permeability setups, among others. These resources empower our students and researchers to perform a wide range of soil tests and experiments, elucidating critical aspects like soil strength, compressibility, permeability, and settlement behaviour.

5. Fluid Mechanics Lab

The Fluid Mechanics lab is a vital component of our engineering curriculum, focusing on the study of fluid properties and behaviours. Equipped with specialized apparatus such as flow meters, pumps, and manometers, students gain hands-on experience in conducting experiments related to fluid dynamics and hydraulics. In this lab, they learn to analyze fluid flow, pressure distribution, and turbulence, helping them apply these principles to real-world

engineering challenges. The Fluid Mechanics lab fosters a deeper understanding of fluid behaviour and equips students with the skills necessary for designing and optimizing systems in industries like civil engineering and mechanical engineering.

6. Hydraulic Mechine Lab

This state-of-the-art facility is used to conduct a variety of experiments pertaining to water. This laboratory provides a means of testing the hydraulic properties of submerged bridges and the hydraulic properties of highway drainage structures and stream crossings.

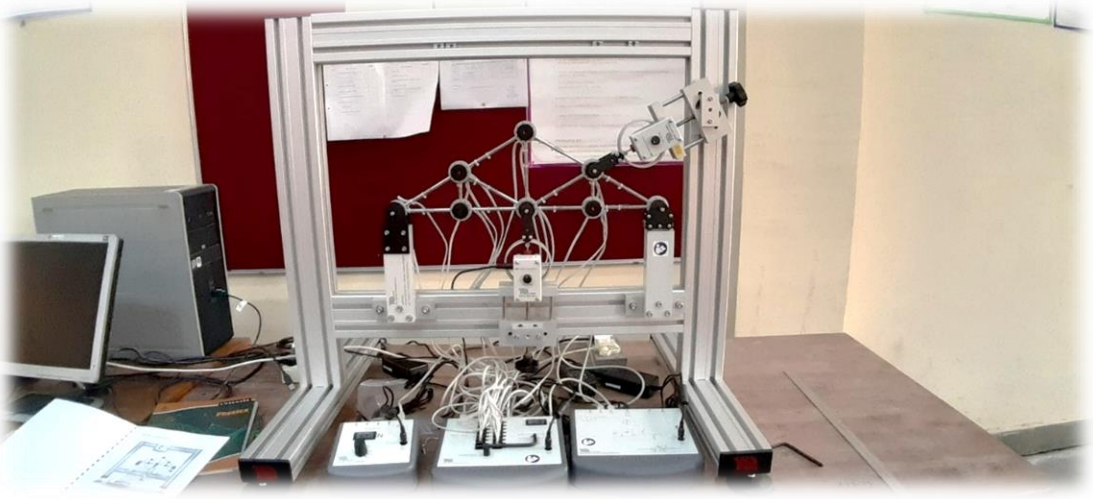
7. Transportation Engineering Lab

The Transportation Engineering Lab is a specialized facility designed to provide students with practical insights into the planning, design, and analysis of transportation systems. Equipped with state-of-the-art models, this lab allows students to simulate and study traffic flow, road design, and transportation network performance. Through hands-on experiments and projects, students gain a comprehensive understanding of traffic engineering principles, traffic management strategies, and sustainable transportation practices. The lab plays a crucial role in preparing students for careers in transportation engineering, urban planning, and traffic management by providing them with the skills and knowledge needed to address the complex challenges of modern transportation systems.

8. Structural Engineering Lab

The Structural Engineering lab serves as a critical hub for hands-on learning and experimentation in the realm of structural analysis and design. This state-of-the-art facility is equipped with advanced testing equipment and models that allow students to explore the behaviour of materials and structural elements under various loads and conditions. Through practical experiments, students gain insights into concepts like stress, strain, deformation, and load-bearing capacity, which are fundamental to structural engineering. The lab not only

enhances their theoretical knowledge but also equips them with the skills required to design safe and resilient structures, preparing them for careers in civil engineering and construction industries.



9. Concrete Lab

The Concrete Lab is a dedicated facility where students can gain hands-on experience in the preparation, testing, and analysis of concrete and related materials. Equipped with specialized equipment for mixing, casting, and curing concrete specimens, this lab enables students to explore the properties and behaviours of concrete under various conditions. Through experiments, they learn about concrete's strength, durability, workability, and other critical characteristics essential for construction projects. The Concrete Lab not only reinforces theoretical knowledge but also equips students with practical skills for quality control, concrete mix design, and construction practices, making them well-prepared for careers in civil engineering and construction management.

10. Material Testing Lab

Material Testing Laboratory is a well-equipped laboratory which provides ideas on the practical knowledge of test several properties of material like ductility, surface roughness, malleability, hardenability etc. The Material testing laboratory provides the basic Knowledge of material strength and the students can perform different tests on different materials. The objective of the Material testing laboratory is to demonstrate the basic principles in the area of strength and mechanics of materials to the undergraduate students through a series of experiments.This laboratory is scheduled for 3rd semester Civil engineering students. Apart from curriculum, some additional experimental setups are there which helps the students to enhance their knowledge. Students also get opportunity to implement their ideas through various application oriented micro projects.


Tinius Olsen