

Department of Civil Engineering

Infrastructure

Details of Laboratory with Equipment facilities

WILLIAM LAMBTON SURVEYING LABORATORY

Surveying Laboratory provides students with hands-on experience to supplement instruction in surveying courses. The experiments include determination of distances using chain and tape, reduced levels and contours using level, bearing of lines using compass, horizontal and vertical angles using theodolite and graphical method using plane table. Use of modern equipment like total station will be demonstrated. This laboratory course will help the students to understand the theoretical concepts learned in the course surveying.

List of equipment:

1. Theodolite
2. Total station
3. GPS system
4. Plane table
5. Surveyor and Prismatic compass



Total station

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LARSEN & TOUBRO CADD LABORATORY

The Larsen & Tubro CADD laboratory is named after the founders of famous construction industry L & T. The laboratory aids to learn latest software such as Autocad, Staad.Pro, Revit Architecture and Revit Structure used in the field of civil engineering. Using Autocad-2D, architectural details of different types of buildings/structures shall be drawn and structural drawings shall be prepared with material specifications. AutoCAD 3D enhances drawing preparation in 3 dimensional rendered view. By using Staad.Pro software, the behavior of multistoried structures shall be analyzed for different types of loads and load combinations. In addition to that, design and detailing of structures also be done as per different codal recommendations. 3D rendered view with walkthrough, modelling of architectural and structural elements shall be done using the softwares Revit architecture and Revit Structures. On the above mentioned softwares Value Added Programs are being conducted for the students. The exercises carried out in CADD lab will develop the design skills in students and make the students more creative and the Value added courses lays a path for students to become a design engineer, Entrepreneur etc., in the construction industry.



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LEONHARD EULER STRENGTH OF MATERIALS LABORATORY

Strength of materials laboratory demonstrates the basic principles in the area of strength and mechanics of materials and structural analysis to students. This laboratory provides knowledge on material's strength, stress, hardness and modulus of rigidity. The laboratory is equipped with key machines such as the Universal testing machine, Torsion testing, and Brinell hardness etc.

List of equipment:

1. Universal testing machine
2. Torsion testing machine
3. Brinell Hardness Testing Machine
4. Rockwell Hardness Testing Machine.
5. Impact testing machine
6. UTM with double shear chuck
7. Spring testing machine
8. Compression Testing machine



Universal testing machine with double shear chuck

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Universal testing machine



Torsion testing machine

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DANIEL BERNOULLI FLUID MECHANICS AND MACHINERY LABORATORY

Fluid mechanics and machinery laboratory helps in determining the various parameters related to fluid flow in pipes and in open channels and to study the characteristics of pumps and turbines. The experiments include determination of friction factor, minor loss coefficients, and coefficient of discharge of constriction meters, orifices, mouth pieces, notches and weirs, characteristics of flow profiles and hydraulic jump and characteristics of pumps and turbines and verification of momentum theorem. This laboratory course will help the students to understand the theoretical concepts learned in the courses fluid mechanics and open channel flow and hydraulic machinery.



Kaplan Turbine



Venturimeter and Orificemeter

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Orificemeter and Orifice tank

KARL VON TERZAGHI SOIL MECHANICS LABORATORY

Soil Mechanics Laboratory facilitates high-level research and development work within the field of geotechnics and soil mechanics with emphasis on advanced soils laboratory testing and field testing. Physical properties include specific gravity, moisture content, density and consistency limits namely, liquid, plastic and shrinkage limits of soil. The engineering properties include permeability, consolidation, compressibility, shear strength and bearing capacity of soil. Testing of soil will increase the potential of the students to test the soil samples in the field conditions and interpret the results efficiently

List of equipment:

1. Hydrometer
2. Liquid and Plastic limit apparatus
3. Shrinkage limit apparatus
4. Proctor compaction apparatus
5. Unconfined Compression machine(UTM 20kN capacity)
6. Direct shear apparatus
7. Triaxial shear test apparatus
8. Soil permeability apparatus
9. Relative density apparatus
10. Infrared moisture meter

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Triaxial shear test apparatus



One Dimensional Consolidation Testing Machine

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Unconfined Compression machine

JOSEPH ASPDIN CONCRETE AND HIGHWAY ENGINEERING LABORATORY

Concrete Highway lab is designed to expose the students to the testing of construction materials. Some of the materials that can be tested in the lab include (i) Cement, (ii) Coarse Aggregates, (iii) Bitumen. The tests performed by the students include determination of specific gravity, fineness, normal consistency, setting times, workability and soundness of cement, fineness modulus of fine and coarse aggregate, strength of cement mortar, cement concrete and bricks, tensile test on steel rods, bending and flexural strength on concrete, bending test on wood, and non destructive test on concrete. The bitumen properties are also tested by the experiments such as tests for penetration, ductility, viscosity, softening point and flash and fire point for bitumen. The students will be able to infer the suitability of these materials for construction purpose.

List of Equipment:

1. Concrete mixer
2. Slump cone apparatus
3. Flow table apparatus
4. Vibrator
5. Compression testing machine

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6. V-bee consistometer
7. Aggregate impact testing machine
8. CBR apparatus
9. Blaine apparatus
10. Marshall stability apparatus
11. Flexural strength testing machine
12. Compaction factor apparatus
13. Ductility Testing machine
14. Bitumen penetration apparatus
15. Aggregate crushing value apparatus



Ductility testing Machine



Abrasion testing Machine



Compaction Factor Apparatus



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RACHEL CARSON ENVIRONMENTAL ENGINEERING LABORATORY

Environmental Engineering Lab is well equipped with sophisticated equipments to characterise water and waste water quality. The lab is equipped with equipments such as Gas Chromatography, Atomic absorption spectrophotometer, and flame photometer. The physical, chemical and biological characteristics of water and wastewater can be determined in this Lab. Apart from the conventional pollutants the presence of heavy metals, volatile organic compounds can also be tested in this Lab. The students also learn how to implement unit processes (sedimentation, filtration, flocculation/coagulation, and disinfection) to design water and wastewater treatment units.

List of Equipments:

1. Oxygen analyzer
2. UV Spectrophotometer
3. Ion selective electrode
4. Flame photometer
5. Gas chromatography
6. Atomic absorption spectrometer
7. BOD and COD analyzer
8. Digital conductivity meter
9. Jar test apparatus
10. pH-meter
11. Digital photo Calorimeter
12. Kjeldal digestion apparatus
13. Microscope
14. Jar tests apparatus

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Atomic absorption spectrometer