

Strength of Materials Lab (SOM)

About the Laboratory

The Strength of Materials Laboratory is equipped with state-of-the-art, computer-controlled testing systems for comprehensive mechanical characterization of engineering materials. The laboratory houses **100 kN servo-hydraulic**, **100 kN servo-electric**, and **2000 kN Universal Testing Machines (UTMs)** for evaluating the tensile, compression, flexural, and fatigue behavior of metallic and non-metallic materials under both ambient and elevated temperature conditions. Advanced **computer-controlled Brinell, Rockwell, and Vickers hardness testers** facilitate accurate determination of macro- and micro-hardness characteristics, while **computer-controlled Charpy and Izod impact testing machines** are used to evaluate the impact toughness of materials.

The laboratory also includes an **Erichsen cupping test machine** for assessing the formability of sheet metals, a **torsion testing machine** for determining torsional strength and rigidity, and dedicated **bending of a beam** and **buckling of struts apparatus** for investigating the structural response and stability of engineering members under various loading conditions. Equipped with modern instrumentation and data acquisition systems, the laboratory provides excellent facilities for undergraduate and postgraduate instruction, research, consultancy, and industrial testing in the fields of materials and mechanical engineering.

Faculty In-Charge

Dr. Satnam Singh

Staff

- Sh. Ved Ansal and Vishal Kumar

Laboratory Courses

S. No.	Course Code	Course Name	Programme (B.Tech./M.Tech./Ph.D.)
1	MEPC207	Strength of Materials (P)	B-Tech-2 nd Year
2	PIPC217	Strength of Materials (P)	B-Tech-2 nd Year

List of Major Equipment/Software

S. No.	Name of Major Equipment/Software	Quantity	Utilization (B.Tech./M.Tech.)
1	Computer controlled 100 KN Servo Hydraulic UTM	01	B-Tech, M-tech and Ph.D.
2	Computer controlled 100 KN Servo Electric UTM	01	B-Tech, M-tech and Ph.D.
3	Computer controlled 2000 KN UTM	01	B-Tech, M-tech and Ph.D.
4	Computer controlled Vickers Hardness Tester	01	B-Tech, M-tech and Ph.D.
5	Computer controlled Torsion Testing Machine	01	B-Tech, M-tech and Ph.D.
6	Computer controlled Brinell Hardness Tester	01	B-Tech, M-tech and Ph.D.
7	Computer controlled Rockwell Hardness Tester	01	B-Tech, M-tech and Ph.D.
8	Computer controlled Charpy and Izod Impact Tester	01	B-Tech, M-tech and Ph.D.
9	100 KN Erichson cupping testing machine	01	-Tech, M-tech and Ph.D.
10	Bending stress in a beam apparatus	01	B-Tech
11	Buckling of struts apparatus	01	-Tech

Laboratory Photographs



Servo Hydraulic Universal Testing Machine (UTM)

Specification

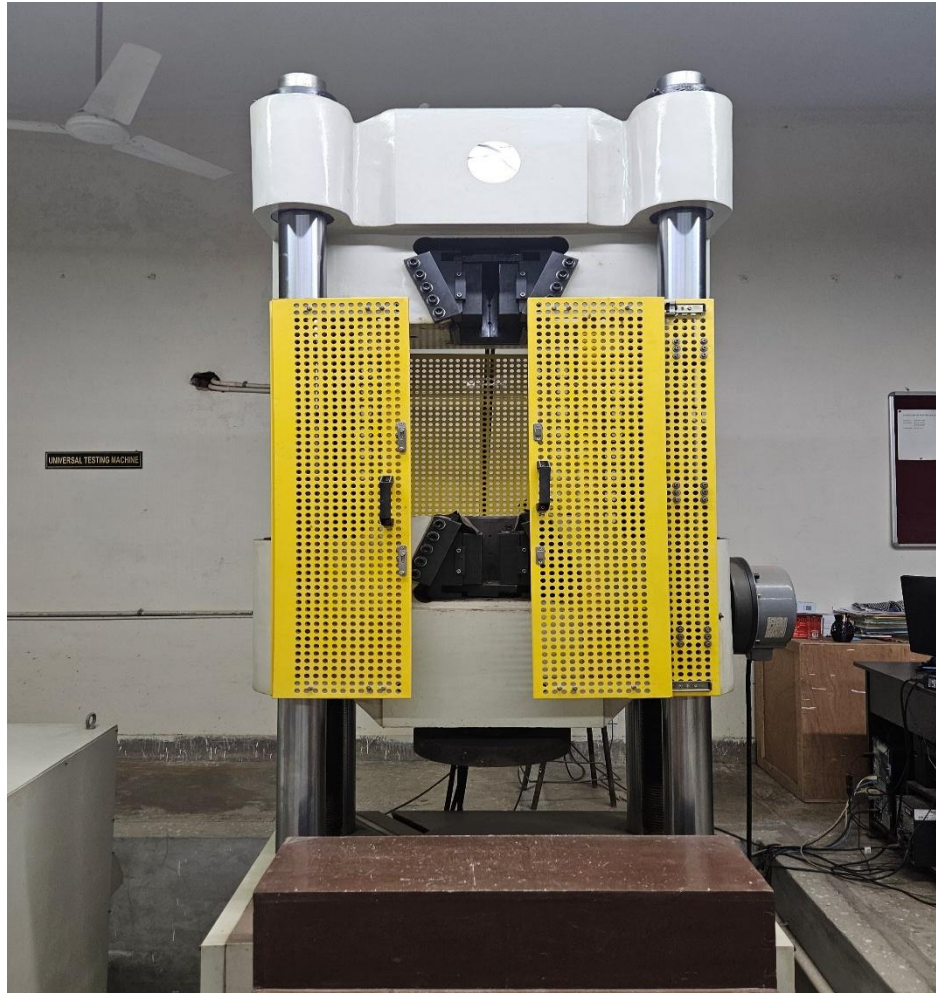
Max Load: 100KN



Servo Electric Universal Testing Machine (UTM)

Specification

Max Load: 100KN



2000KN Universal Testing Machine (UTM)

Specifications

Max Load: 2000 KN

Load and deformation enlargement multiple: 1, 2, 5, 10

Load measuring range: 2-100%Fs

Load accuracy: $\leq 0.5\%$



Vickers Hardness Tester

Specification

Max Load: 50 kgf
Diagonal measuring Range (mm): 0.05-0.4
Max. test height: 200
Deep of Throat: 135
Scale least: 0.001



Torsion Testing Machine

Specification

Max test torque: ± 1000 N.m
Measuring range of test load (Nm): 20-100
Relative error of torque display: $\pm 1\%$
Range of test speed: 3-360
Min. reading of torsion angle: 0.1°



Brinell hardness Testing Machine

Specifications

Total Load: 250 to 3000 in stages of 250 kgf

Max. Test Height: 380

Deep of Throat: 200

Max. depth if elevating screw below base (mm): 180



Digital Hardness Tester



Charpy and Izod Impact Testing Machine

Specifications

Impact energy: 250J, 500J

Impact velocity: 505 m/s

Raised Angle: 150°



Erichson Cupping Testing Machine

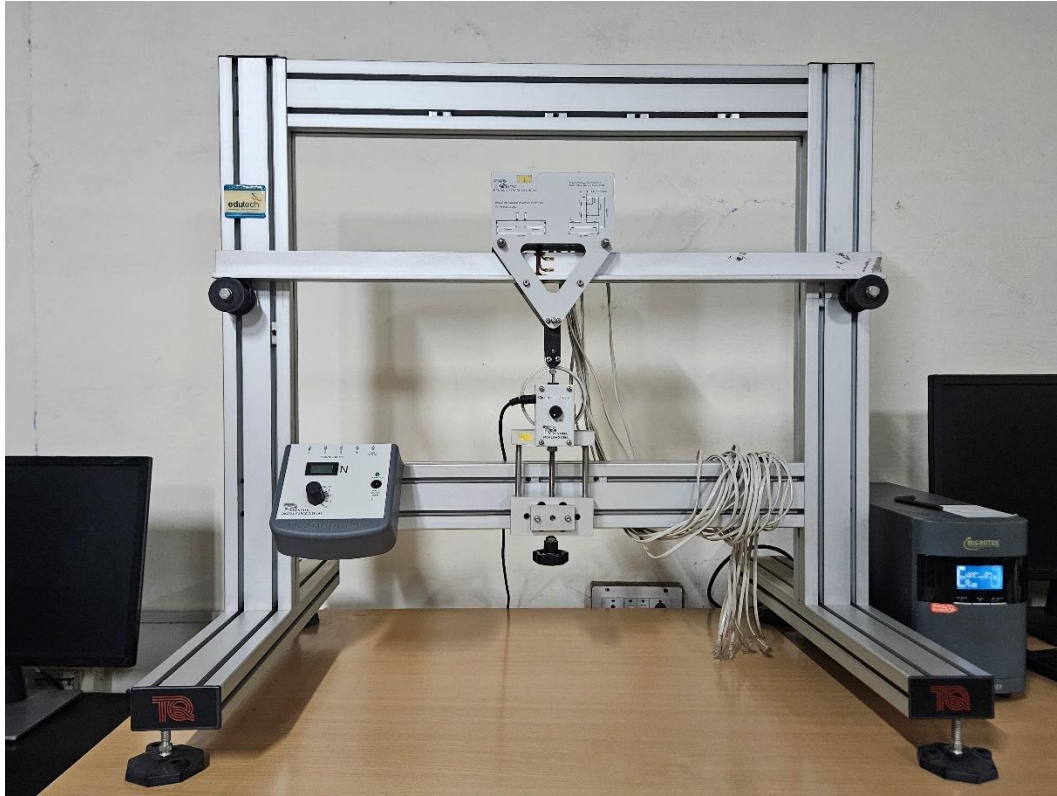
Specifications

Capacity: 100 KN

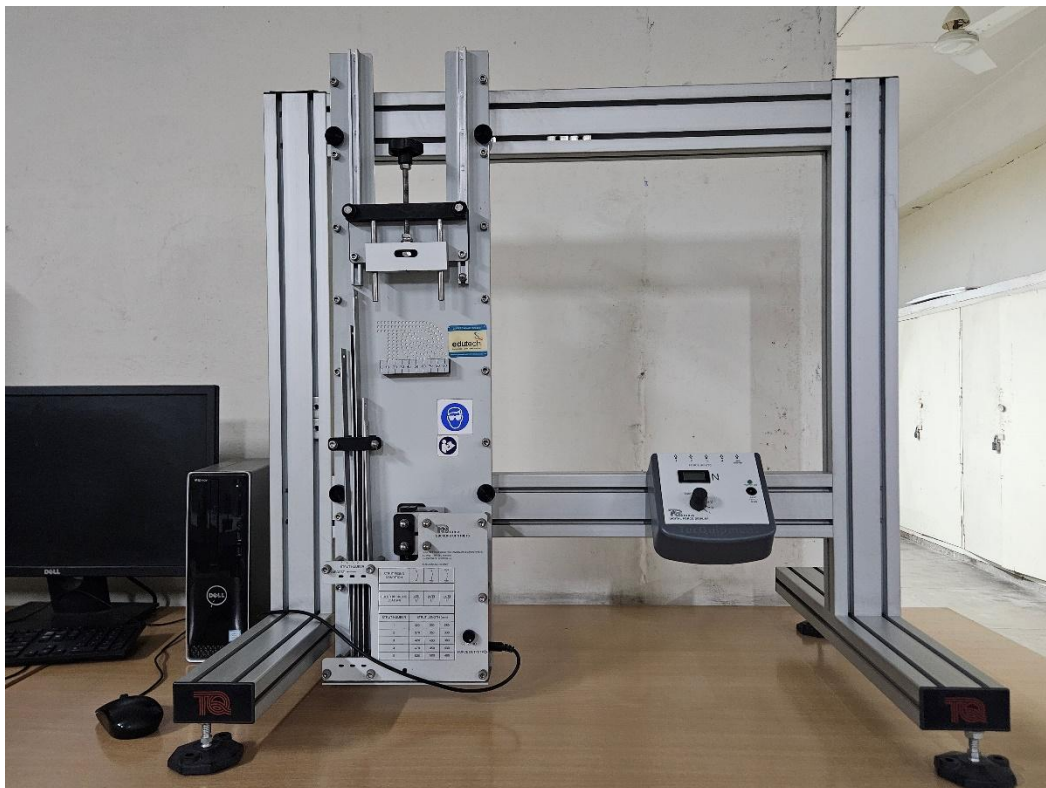
Load Accuracy: $\pm 0.5\%$

Stroke Speed: 0.005 to 250 mm/min

Max. width of sheet: 110 mm



Bending Stress in a Beam Apparatus



Buckling of Struts Apparatus