

Mechanics & Graphics Lab



Mechanics and Graphics Lab was established in 2016 and is offered in the first year of B. Tech. programme. It is an interdisciplinary subject consisting of mechanics, engineering graphics, and computer-aided design (CAD). Students learn engineering graphics, instruments, lines, lettering, dimensioning, Technical representation of objects in the form of orthographic Projection of points, lines, planes & Solids. Development of surfaces of solids, digital 3D Isometric projections of real-life objects. Students use various CAD software's to draw plan, elevation and other views of different objects. Real life rendering, lighting, walkthrough videos, material and finishes and environment modelling in 3D are some interesting areas. Objective of Mechanics part of the lab is to impart practical knowledge on design and analysis of mechanisms for the specified type of motion in a machine. With the study of rigid body motion and forces for the transmission systems, machine kinematics and dynamics can be well understood.

The CAD introduces students to 2D and 3D modelling and simulation of objects and products, processes. Process planning is an engineering activity that determines the appropriate procedures for transforming raw materials into a final product as per engineering design specifications.

List of Major Equipment's Available in lab

- Parallel Force Systems Apparatus Simple Truss Model
- Friction (Sliding/Rolling/Rope-Pulley)
- Measurement Screw Jack
- Fly Wheel
- Law of Polygon of Forces
- Universal Vibration Machine
- Jib Crane apparatus
- Universal force table
- 20 computers with equipped software like AutoCAD, 3DS MAX, GNU Octave.

List of software

- AutoCAD
- 3 DS Max
- GNU OCTAVE
- MATLAB
- C & C++

Areas of Experiments

1. Verification of equilibrium equation for coplanar forces.
2. Verification of Lami's theorem.
3. Verification of Law of polygon of forces.
4. Determination of coefficient of friction.
5. Analysis of truss (Analytical / Graphical method).
6. Deflection of beam
7. Jib crane apparatus.
8. Support reactions of beams.
9. Development of solids
10. AUTOCAD 2D, 3D Modelling, editing, rendering etc
11. AUTOCAD IN Electronics engineering
12. Orthographic views/Projection using AUTOCAD
13. Isometric Projection using AUTOCAD
14. GNU Octave/MATLAB programming in Mechanics
15. C programming for scan converting Line, Circle etc.
16. C programming for 2D/3D transformation.
17. C programming for clipping & flood fill, scan fill algorithm.



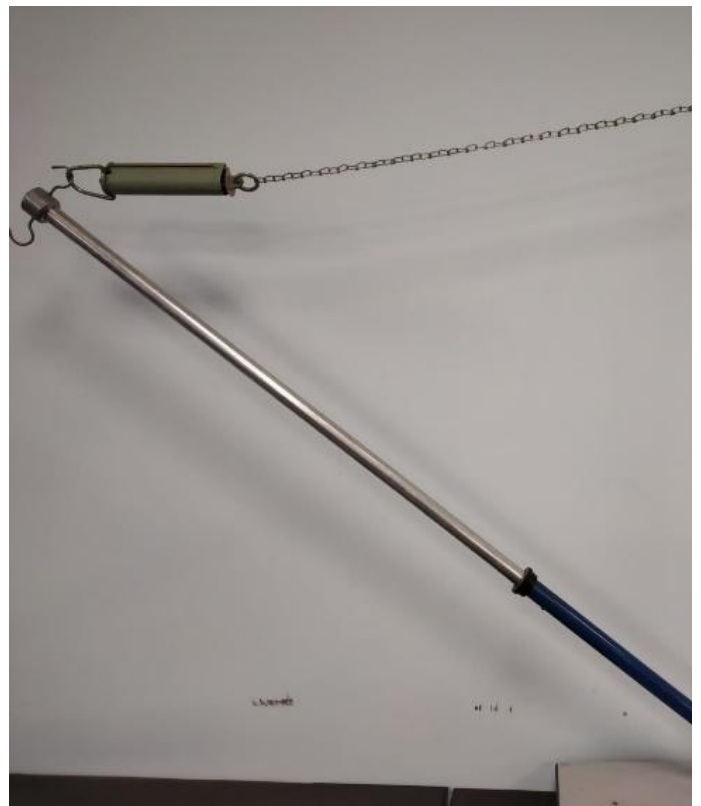
Friction in an inclined plane



Parallel Force Systems Apparatus



Rope belt friction apparatus



Jib crane apparatus



Reaction of forces in beam apparatus



Universal vibration Apparatus



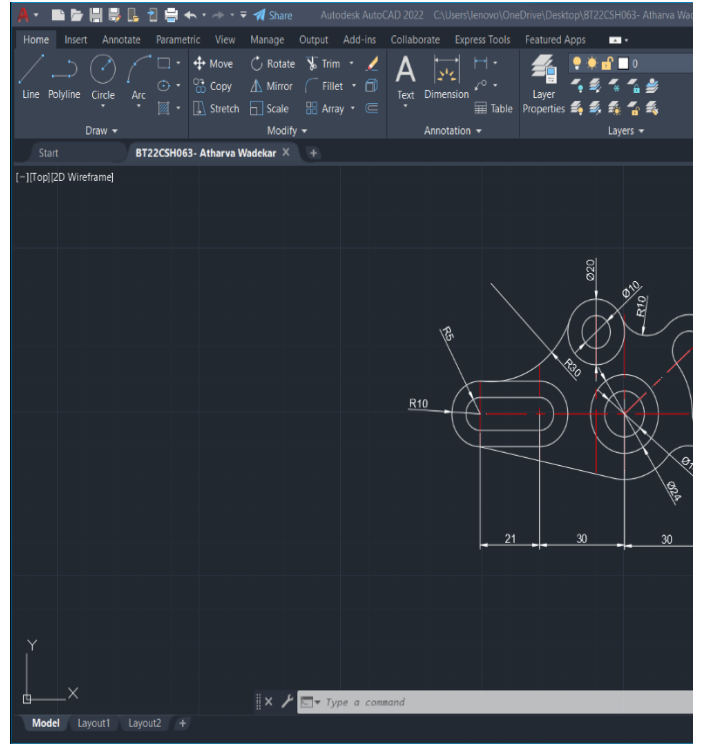
Universal Force table apparatus



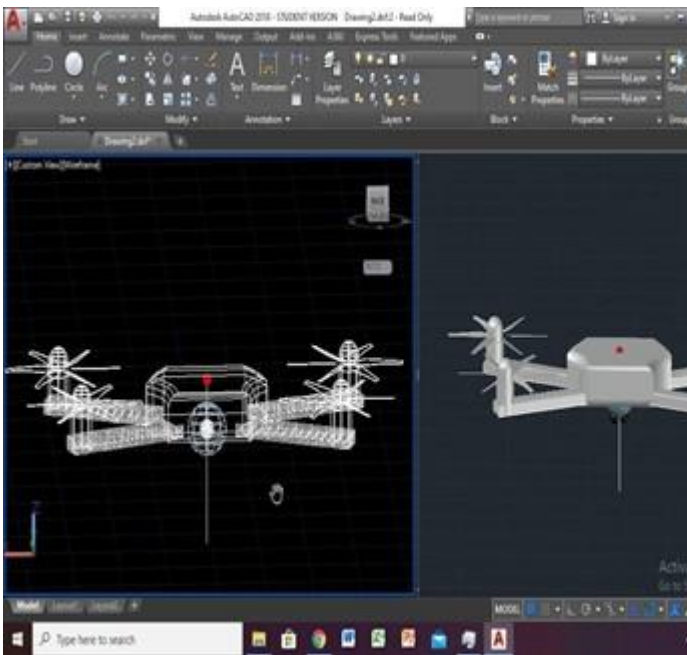
Screw jack apparatus



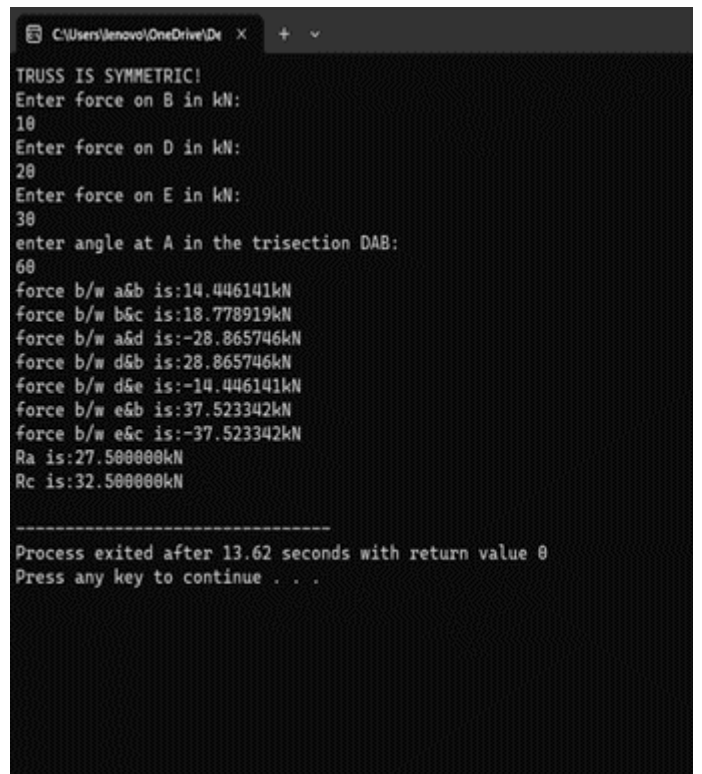
Parallel force apparatus



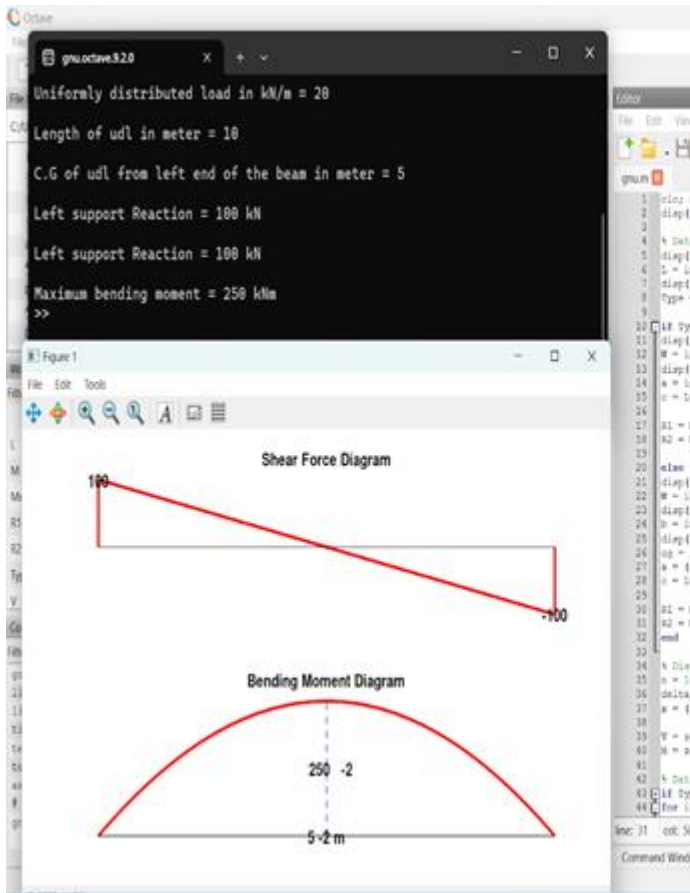
2D modelling in AutoCAD



3D Design of Drone in AutoCAD



Force analysis in Truss member using C++



SFD-BMD using GNU Octave