

ES 106 B: MANUFACTURING AND WORKSHOP PRACTICE

Indian Institute of Technology (IIT), Gandhinagar



PROJECT REPORT

Topic:

THE ALL ABLE TABLE

By: Group 10613

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PREFACE

The world of academics demands focus, dedication, and continuous learning to improve one's performance. However, studying in an unorganized and uncomfortable environment can lead to fatigue and hinder a student's progress. That's why we have developed a specialized study table, the **All Able Table**.

The table is designed to provide students with a well-organized and comfortable space to learn. With a focus on innovation and practicality, we have created a lightweight and aesthetically pleasing prototype that can make a significant impact on a student's study routine. Designing a study table that offers a range of features to enhance the study experience was a challenging task that motivated us to create this product. We firmly believe that our All Able Table has a practical application in the world of academics, as it can help students of all levels study efficiently, comfortably, and in style.

Our innovative product comes equipped with features such as an inclination adjustment feature for the laptop stand, a bottle holder, and a pen drawer, designed to cater to the diverse needs of students. We are excited about the potential impact of our product on the student community, and we believe that it can play a significant role in helping students achieve their academic goals.

INDEX

Sl. No.	Topic Number	Page number
1	A. DESCRIPTION OF THE PRODUCT	5
2	B. LIST OF COMPONENTS	6
3	C. DRAWINGS OF EACH COMPONENTS	7
4	D. INSTRUCTION FOR ASSEMBLING THE COMPONENTS	15
5	E. LIST OF GROUP MEMBERS AND THEIR CONTRIBUTIONS	17

A. DESCRIPTION OF THE PRODUCT

The All Able Table is a customized study table designed for students to have an ordered setting and study. It is intended that there are specific slots for things to be placed so that the table looks less messier. The laptop stand embedded on the table with the bottle holder and the pen drawer combined with the sleek design and waterproof vinyl coating caters most of the needs of a student to study on a table in a well organized manner. The positioning of various components are done in such a manner that the student would be comfortable in the arrangement and also yearning for maximum space utility.

Some of the salient features of our product are:

INCLINATION ADJUSTMENT FEATURE OF LAPTOP STAND: This innovative feature allows students to adjust the slope of the laptop stand to a comfortable angle that reduces strain on the neck and back, enabling them to study for longer periods without discomfort.

BOTTLE HOLDER: The bottle holder is another thoughtful addition to the table's design, providing a dedicated spot for students to keep their water bottle within easy reach while studying. This feature also minimizes the risk of water spills and damage to electronic devices.

PEN DRAWER : The slidable pen drawer helps in providing a designated space for pens, pencils, erasers, and other small stationary items. The drawer is slidable, allowing for easy access to the items and reducing the risk of items rolling off the table or getting lost.

AESTHETICAL BEAUTY AND STABLE DESIGN: The vinyl sheet stuck on the table and the well welded frames grants the table a sleek look and overall provides a good ambience to study. The water proofing nature of the vinyl sheet adds to the value.

LIGHT WEIGHT: Moreover, the table's weight is optimized for easy portability, making it easy to move and adjust the study area as needed. This feature is particularly useful for students who need to relocate their study space frequently.

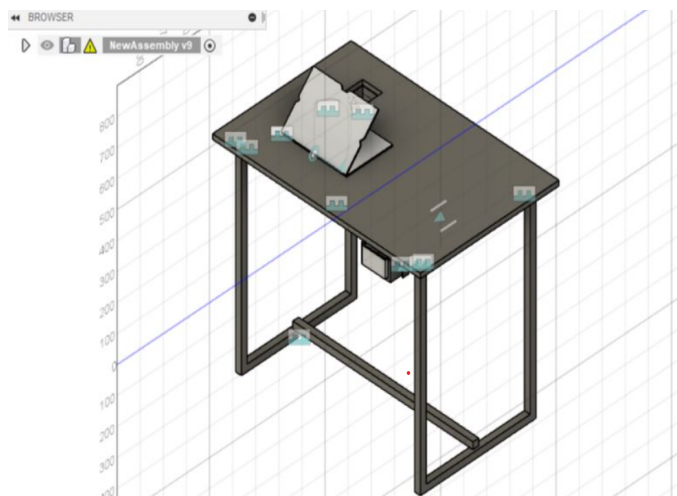
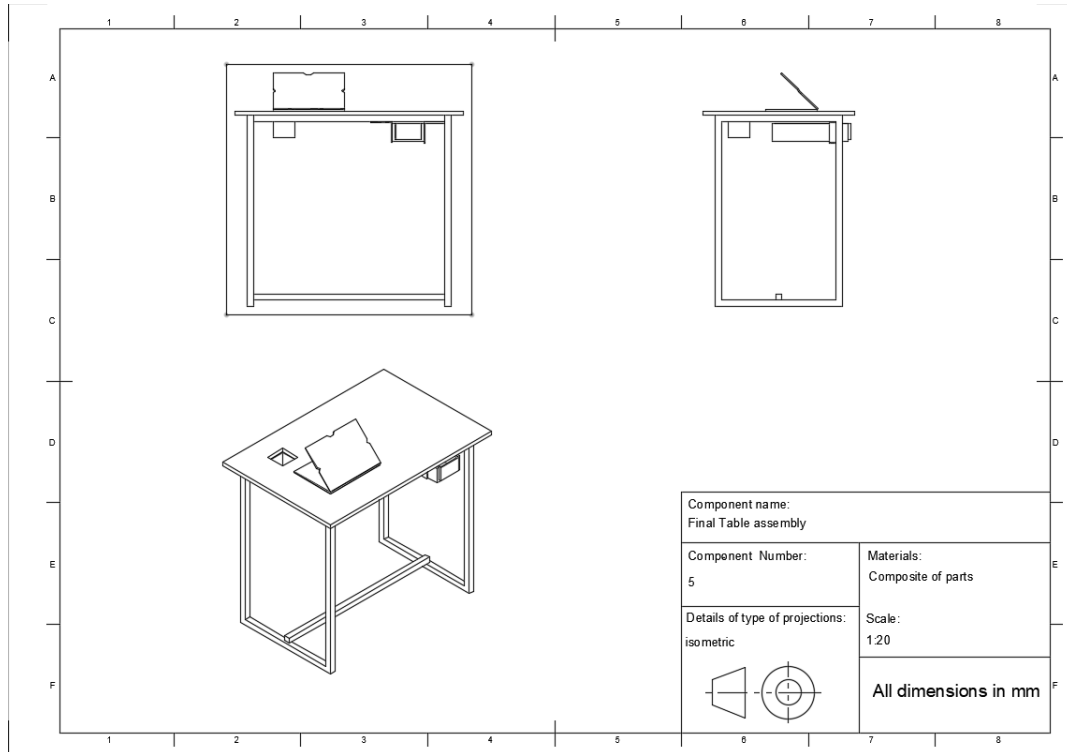
Overall, the All Able Table is a perfect study table that offers a range of features designed to enhance the study experience. It is a valuable investment for students seeking a practical, comfortable, and aesthetically pleasing study environment.

B. LIST OF COMPONENTS

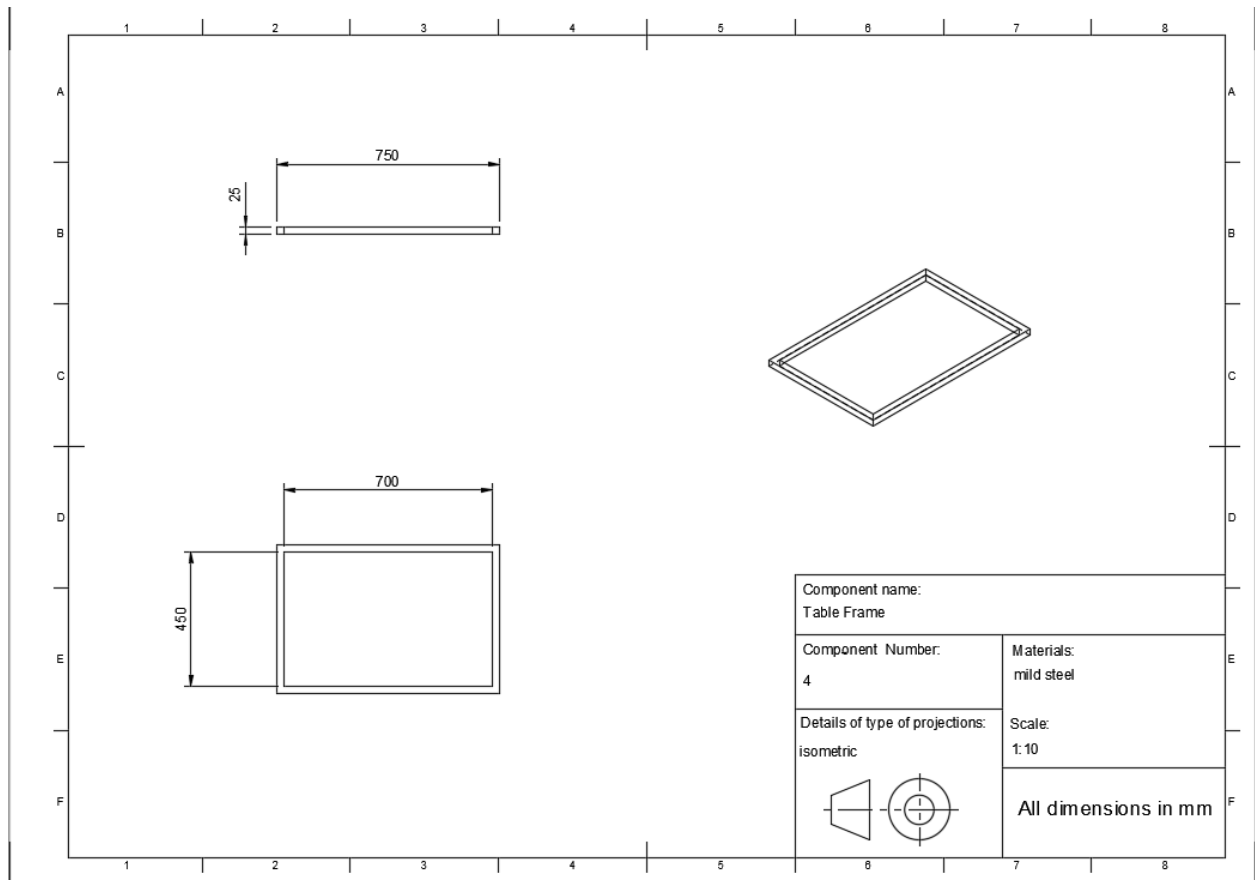
Sl. No.	Name of the component	Trades of Manufacturing included
1	Leg Frame	Welding
2	Table Top	Carpentry
3	Pen Drawer	Carpentry, Laser Cutting
4	Bottle Holder	Sheet Metal Operations
5	Laptop Stand	Rapid Prototyping(Laser Cutting)

C.DRAWINGS OF EACH COMPONENTS

OVERALL ASSEMBLY



1. LEGS



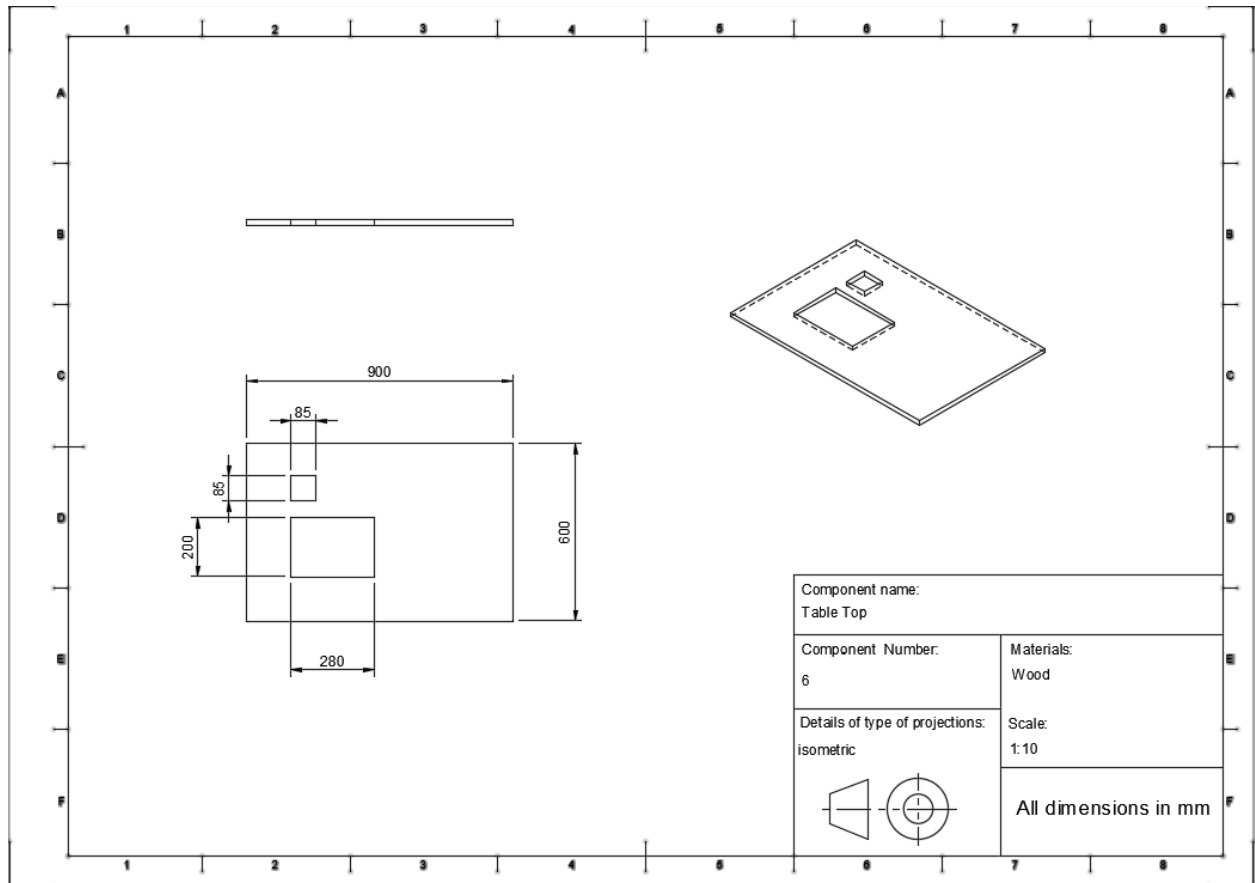
These represent the legs of the table, consisting of two vertically standing rectangular frames and connecting rods to connect in the middle.

Material Used - Mild steel rods

Manufacturing Processes included - welding , cutting , grinding, fitting, sanding

Rectangular frames designed to help in increased stability and better weight distributions. The two frames were connected together by totally three rods of which one can be used as a footrest.

2. TABLE TOP



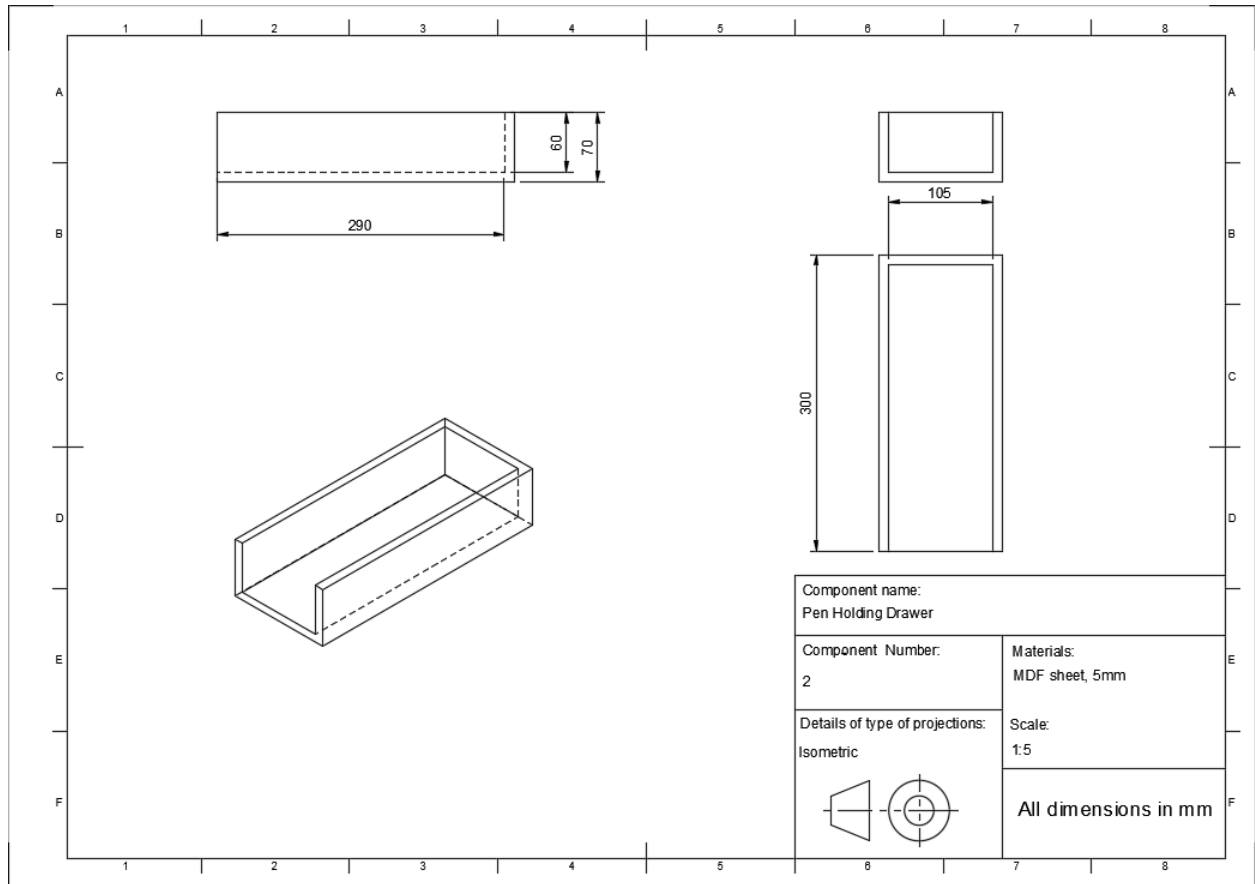
The tabletop is the top layer of the table where all the other parts are attached. The laptop stand is embedded on the table top by making it sit in a hole sized with its dimensions and then supporting it with a small ply from beneath. The bottle holder is inserted and screwed in a hole made on the tabletop.

Material used: Wood

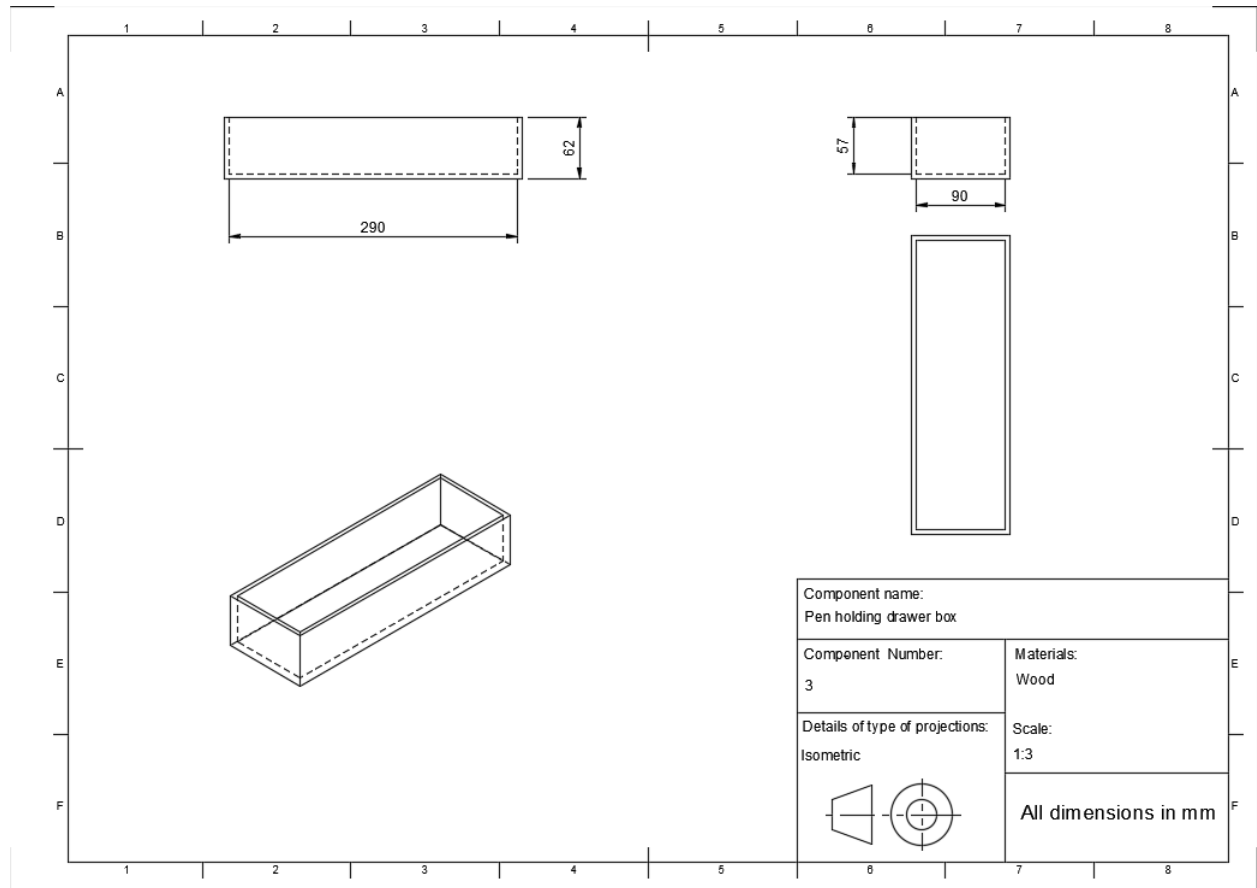
Manufacturing Processes used: Carpentry (dimensioning, cutting using machine, filing)

3. PEN DRAWER

OUTER CASE



INNER SLIDABLE PART

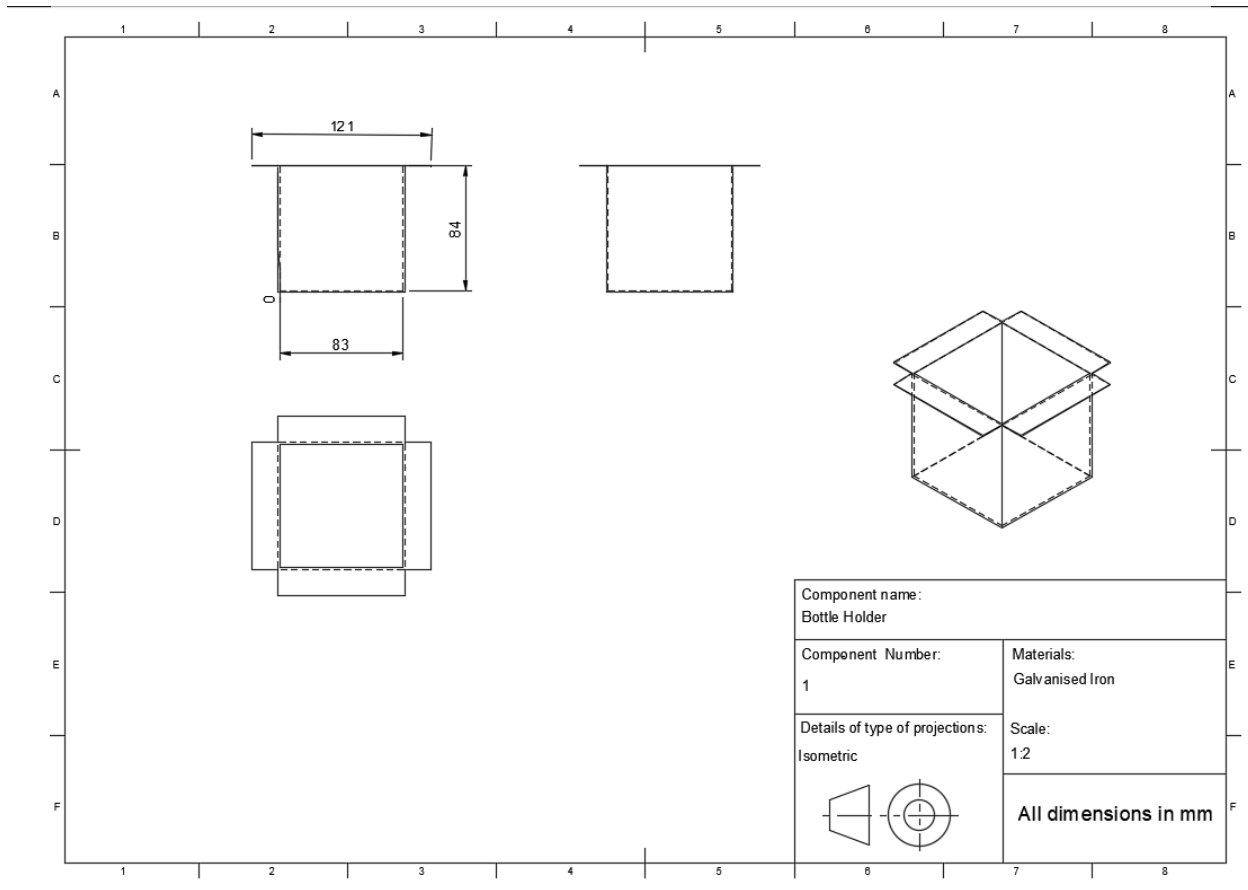


The Pen drawer is a slidable component that is attached to the bottom part of the tabletop. It consists of two parts, the fixed outer case attached to the beneath of the table by the L clamps we made and the inner drawing part fully interlocked by laser cutting on mdf.

Material used - wood and mdf

Manufacturing processes involved - Carpentry (Dimensioning, Cutting, Planing, Filing) , Rapid Prototyping (laser cutting) and Cutting and Fitting

4. BOTTLE HOLDER

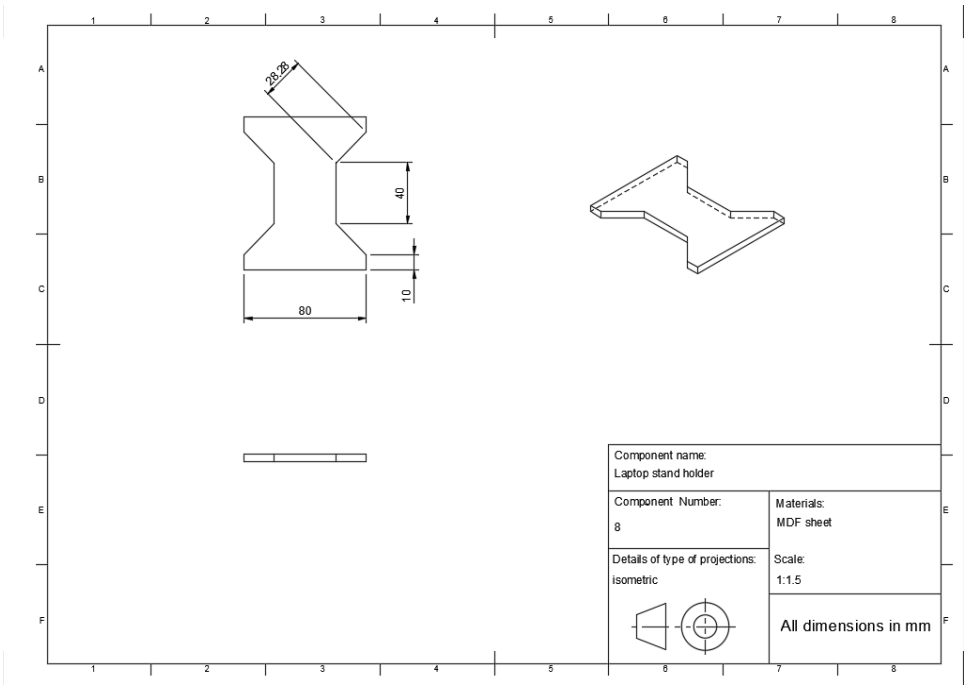
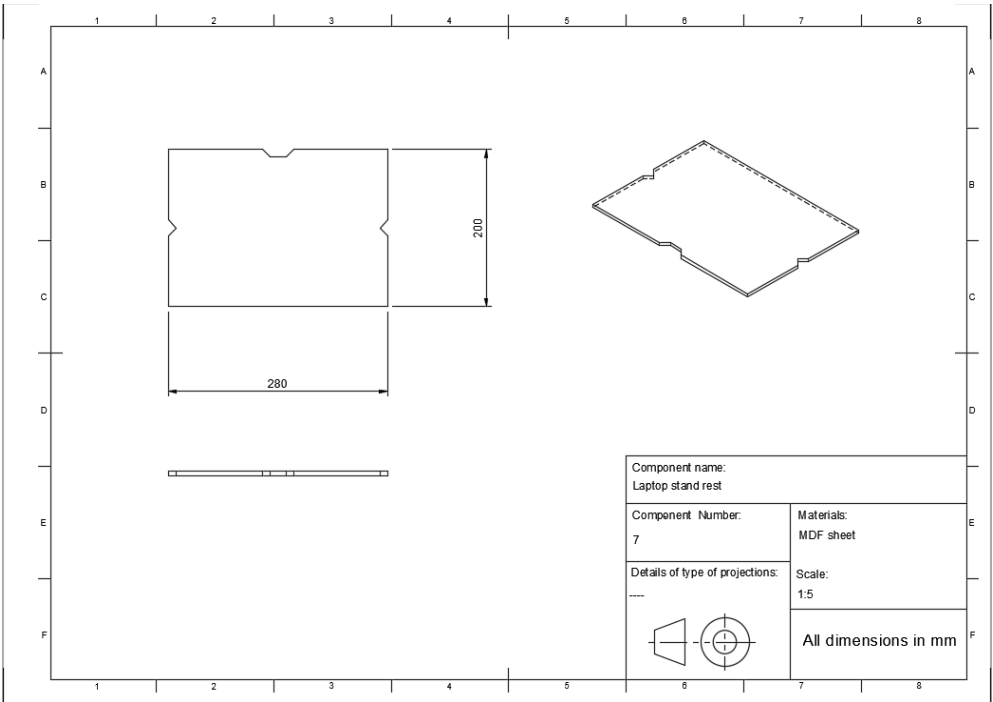


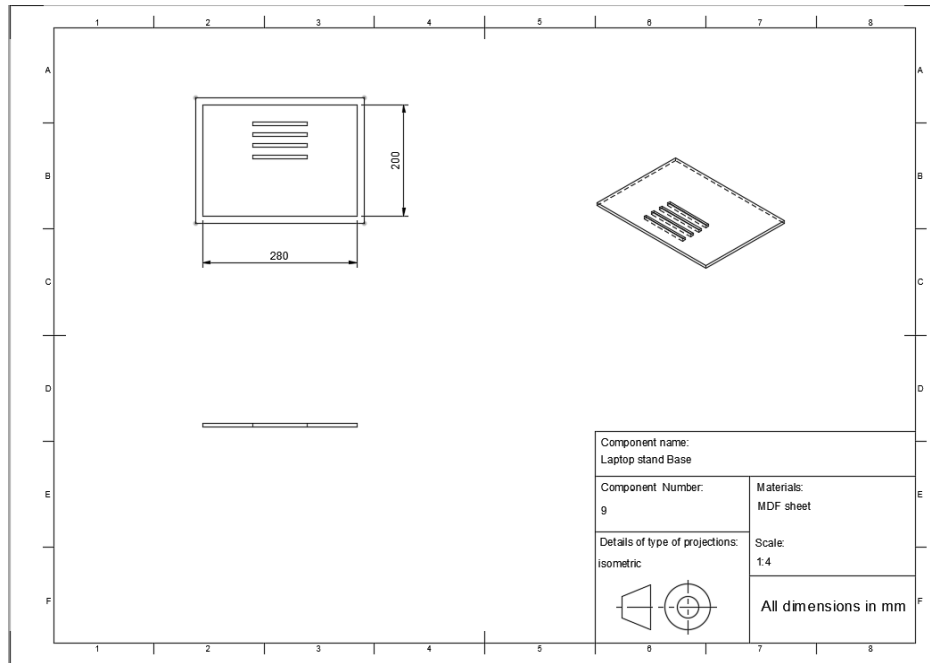
The bottle holder is a space specifically dedicated to a bottle for the arranged appearance of the table and easy utility. Made of sheet metal, the square shaped bottle holder is attached to the table by screws at the location of its hole.

Material used: Galvanized iron sheet

Manufacturing Process Involved: Sheet Metal Operations (dimensioning, cutting, flattening, hammering, bending)

5. LAPTOP STAND





The laptop stand is built by the process of laser cutting. The laptop is embedded on the tabletop and made to sit inside the hole carved on the table from support from beneath. The inclination of the laptop stand can be adjusted according to the available slots. The part has undergone some changes in dimensions and logistics.

Material used: MDF

Manufacturing Process: CAD modeling on Fusion 360, Laser Cutting on LaserCAD

D. INSTRUCTION FOR ASSEMBLING THE COMPONENTS

Step 1 : Cutting of the mild steel rods at 45 degree angle with the appropriate length and welding of the 8 rods in order to form two rectangular frames



Step 2 : Dimensioning and cutting of the table top.

Step 3 : Extruded the table top to create space for bottle holder and laptop stand.

Step 4 : Made the laptop stand with laser cutting and joined the parts with the hinge



Step 5 : Made the outer case of the pen drawer of plywood by cutting and joining

Step 6 : Made the drawings for the inner, slidable part of the pen box and laser cutted it



Step 7 : Galvanized iron sheet was dimensioned and cutted. Bending the edges of the sheet and hammering to give it a cuboid shape. Fixing of the base and riveting to fix the shape of the bottle holder

Step 8 : Drilled holes in the frames to fit the table top. Attached table top to the welded structure with the screws

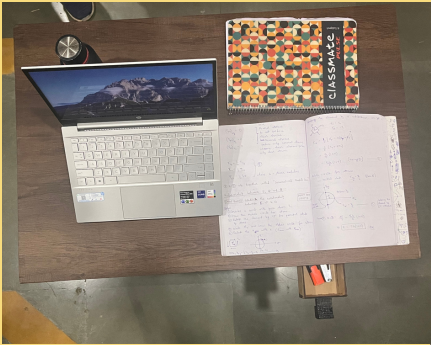
Step 9 : Attached the drawer frame to the bottom of the table top by making L shaped rods and riveting them.

Step 10 : Laptop stand was embedded in the extrusion

Step 11 : Vinyl sheet was dimensioned, cut and stitched and painting was done

E. LIST OF GROUP MEMBERS AND THEIR CONTRIBUTIONS

Name	Contribution
Aaryan Darad	Laser Cutting of laptop stand and pen box and assembling these parts together and then to the table. Also contributed to the commercial brochure
Alok Vidyarthi	Making bottle holder by sheet metal operations and helped in assembly and report
Animesh Tumne	AutoCAD modeling and assembly and pen box; deciding the dimensions and finalizing them. Also helped in Laser cutting and tight fitting of drawer
Kaushal Kothiya	Made the bottle holder using sheet metal operations, AutoCAD modeling and assembly of pen box
Nishant Tatar	Welded the frame of the legs and contributed to the assembly and report
Pushkar Parakh	Worked on the table top, embedding the bottle holder and laptop stand, made the pen box and contributed to the assembly
Sharika S	Worked on the table top, made the pen box and contributed to assembly and report
Shashank Ghosh	Welded the leg frame , attachment of the pen box to the table and contributed to the assembly



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now**

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*Experience ultimate
workspace luxury with*

The All Able Table



ONE TABLE, ENDLESS POSSIBILITIES:

Laptop Stand

Elevate your laptop to a comfortable viewing level with our adjustable laptop stand.

Bottle Holder

Stay hydrated while you work with our convenient bottle holder, keeping your drink within reach.

Pen Drawer

Keep your workspace organized and clutter-free with our built-in pen drawer



THE ALL ABLE TABLE

**Where style meets
functionality**

With sleek, modern design and versatile multi-functional features, this tabler ensures maximum productivity and organization, while the stylish look and feel of the table add an element of sophistication to any room. Stay comfortable, efficient, and stylish with the All Able Table.



*Experience versatility
like never before...*

Introducing the All Able Table, the ultimate solution for versatile and efficient workspace organization. This multi-functional table has everything you need to stay comfortable and productive throughout the day. Perfect for use in the office, at home, The All Able Table is your all-in-one solution for maximum efficiency and organization.