STUDENT LAB SAFETY, HIRARC, DATASHEET VERIFICATION CHECKLIST, AND BRIEF REPORT SUBMISSION

EXPERIMENT ED1: ENGINEERING DRAWING 1 (OPEN ENDED)

STUDENT NAME : _____
MATRIC NO. : _____
GROUP : _____
DATE : _____

A. Equipment and System Verification Checklist

Item	Verification Requirement	✓
Autodesk Fusion Software	Software opens correctly and required modelling tools are available.	☐
Sketch Setup	Correct sketch plane is selected before modelling.	☐
Base Model	Base geometry dimensions are verified before extrusion.	☐
Rib Structure	Rib is created using proper constraints and dimensions.	☐
Top Structure	Top geometry, hole dimensions and constraints are verified.	☐
Fillet Features	Required fillets are applied to correct edges and dimensions verified.	☐
Material Assignment	Appropriate materials are selected and assigned to model components.	☐
File Management	Design file is saved using an identifiable filename and location.	☐
Engineering Drawing	Orthographic, isometric views and dimensions are generated correctly.	☐

B. HIRARC Checklist (OSH-Based Risk Assessment)

Hazard / Unsafe Condition	Potential Consequence	Control Measure	✓
Incorrect sketch dimensions	Invalid model geometry and incorrect engineering drawing	Verify all dimensions before extrusion and modification.	☐
Wrong sketch plane selection	Incorrect component orientation	Confirm selected plane before creating sketches.	☐
Missing geometric constraints	Unstable or inaccurate model definition	Apply coincident, tangent and perpendicular constraints where required.	☐
Incorrect rib, fillet or extrusion settings	Model does not meet design requirements	Verify feature parameters before confirming operations.	☐
Incorrect material assignment	Unrealistic representation of final product	Check material selection before finalising the model.	☐
Unsaved or overwritten design files	Loss of modelling work	Save files systematically and frequently.	☐
Incorrect dimensioning	Manufacturing and communication errors	Verify dimensions and views before submission.	☐

on engineering drawing			
Extended computer use / poor workstation setup	Physical discomfort and reduced concentration	Maintain proper posture and organise the workstation during the session.	☐

C. Engineering Practice Verification

Requirement	✓
Base, Body and Top components are modelled successfully.	☐
At least two circular features are incorporated in the final design.	☐
Rib feature is incorporated in the body structure.	☐
Different materials are assigned appropriately to model components.	☐
Complete orthographic and isometric engineering drawings are generated.	☐
All critical dimensions are included in the engineering drawing.	☐
Proposed fabrication/prototyping method is technically justified.	☐
Effective 3D modelling strategies are discussed in the report.	☐

D. Student Declaration

I confirm that I have completed the above verification and HIRARC checks, verified the CAD model and engineering drawing settings, and will report any software, workstation or laboratory issue to the demonstrator/technician.

☐ The correct sketch planes were selected before creating each model feature.

☐ All sketches were dimensioned and geometrically constrained before extrusion or modification.

☐ The base, body, rib, and top structures were created according to the required dimensions.

☐ Coincident, tangent, and perpendicular constraints were applied where required.

☐ Extrusion, rib, fillet, hole, and other feature settings were verified before confirmation.

☐ The open-ended model contains three distinguishable main parts: Base, Body, and Top.

☐ At least two circular features and one rib feature were incorporated into the open-ended model.

☐ Appropriate and distinguishable materials were assigned to the model components.

☐ Front, top, side, and isometric views were generated.

☐ All critical dimensions were included in the engineering drawing.

☐ The model and engineering drawing were checked for dimensional consistency.

☐ Screenshots and results were obtained from the actual Autodesk Fusion model.

☐ Design and drawing files were saved and backed up using identifiable filenames.

☐ All results and observations were recorded accurately.

☐ Engineering ethics and academic integrity were maintained throughout the experiment.

Student Signature : _____

Date : _____

E. Experimental Results Record

Task 1: 3D Modelling Geometric Structure

Part	Observed Value / Observation
Base Part	Shape and dimensions : _____
Body Part	Shape and dimensions : _____
Top Part	Shape and dimensions: _____
Circular Features	Number and locations: _____
Rib Feature	Description and purpose: _____
Fillet Features	Locations and dimensions : _____
Material Selection	Materials used : _____

Task 2: Open Ended 3D Engineering Drawing

Model Name: _____

Main Part	Structure / Shape Description	Dimensions / Features	Material Selection
Base			
Body			
Top			

Task 3: Engineering Drawing Verification

Requirement	Completion Status
Front View Generated	☐
Top View Generated	☐
Side View Generated	☐
Isometric View Generated	☐
Dimensions Added	☐
Drawing Layout Completed	☐

Task 4: Fabrication and Prototyping Analysis

Item	Response
Proposed Fabrication Method	
Equipment Required	
Expected Material	
Expected Differences Between CAD Model and Actual Fabricated Product	

Task 5: Effective 3D Modelling Strategies

Strategy	Explanation
Strategy 1	
Strategy 2	
Strategy 3	
Additional Strategy (Optional)	

Discussion Notes

If the model were to be fabricated or prototyped, discuss the suitability of the selected fabrication method, expected manufacturing limitations, dimensional tolerances and any differences between the CAD model and the actual product.

DISCUSSION:
CONCLUSION:

LAB LECTURER		**INSTRUCTOR**	
SIGNATURE	**: _____**	**SIGNATURE**	**: _____**
DATE	**: _____**	**DATE**	**: _____**