



Engineering Design Report

Team Number:	
Team Name:	
Achieved Score	Judges Remarks

Engineering Problem, Requirements and Design Basis	Problem and design objectives are unclear. Requirements, constraints, and design targets are missing.	Basic objectives and requirements are defined. Limited design constraints and performance targets are presented.	Clear problem definition with relevant requirements, measurable KPIs, and design constraints.	Well-defined engineering objectives, measurable targets, and clear justification of the initial design basis.		
	0 - 3	4 - 7	8 - 11	12 -15	Out of 15	
Aerodynamic Design and Aerofoil Selection	Limited aerodynamic understanding; FBD, aerofoil selection, or justification is missing or incorrect.	Basic aerodynamic principles explained. Limited comparison of aerofoils and wing options.	Relevant aerodynamic calculations, graphs, and comparisons support aerofoil and wing selection.	Thorough aerodynamic evaluation with strong technical justification for aerofoil, wing, and design choices.		
	0 - 6	7 - 12	13 - 18	19 - 25	Out of 25	
Aircraft Configuration and Stability	Poor aircraft configuration; CG, moment balance, or static margin is missing or incorrect.	Basic configuration and CG calculations presented. Limited stability evaluation.	Aircraft configuration is justified using CG, moment balance, and static margin calculations.	Thorough configuration and stability evaluation, with calculations supporting key design decisions.		
	0 - 5	6 - 10	11 - 15	16 - 20	Out of 20	
CAD Development and Technical Design	Incomplete CAD model with missing components or unclear geometry.	Basic 3D models and assemblies with limited technical detail.	Complete CAD model with appropriate components, assembly, dimensions, and technical drawings.	Accurate CAD models document key stages, detailed assemblies, complete drawings, and consistent engineering practice.		
	0 - 3	4 - 7	8 - 11	12 -15	Out of 15	
Engineering Analysis and Simulation	Minimal analysis; flawed setup and unreliable results.	Basic analysis; setup, assumptions, and results lack detail.	Relevant analysis with documented setup and meaningful results.	Rigorous analysis with realistic conditions and justified results.		
	0 - 5	6 - 10	11 - 15	16 - 20	Out of 20	
Design Iteration and Engineering Decision-Making	Only the final design is presented. Little evidence of design changes or decision-making.	Some design changes are documented, with limited justification.	Design iterations are supported by calculations, simulations, or identified design problems.	Clear design evolution with evidence-based decisions, comparisons, and justified trade-offs.		
	0 - 5	6 - 10	11 - 15	16 - 20	Out of 20	
Manufacturing Development and Implementation	Manufacturing methods and materials are poorly documented or unsuitable.	Basic manufacturing plan with limited process details and justification.	Manufacturing methods, tools, and process sequence are documented.	Complete manufacturing plan with justified methods, practical constraints, and documented solutions.		
	0 - 5	6 - 10	11 - 15	16 - 20	Out of 20	
Engineering Report Quality and Evidence	Poor report structure. Important figures, calculations, and supporting evidence are missing.	Basic structure with inconsistent presentation and limited supporting evidence.	Clear report structure with relevant figures, graphs, calculations, and technical explanations.	Clear, organized report with traceable evidence and logical flow from requirements to manufacturing.		
	0 - 3	4 - 7	8 - 11	12 -15	Out of 15	
Incorrect File Name:	☐	Late Submission:	☐	TOTAL SCORE:		
					Out of 150	



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Rule Tag	Name	Description	Constrain	Value	Unit	Penalty	Cleared
R4.2	Aerofoil selection and analysis	Primary wing aerofoil selected from UIUC database, identified by designation, analysed using XFOIL/XFLR5 or equivalent, justified and documented in FER.	Document / profile check	UIUC profile + analysis		Critical	☐
R4.4	Wing aspect ratio	Total wingspan ² / projected wing planform area; include area passing over/through fuselage.	Minimum	5		Critical	☐
R4.9	Wing drawing dimensions and details	FER engineering drawings identify span, root/tip chord, sweep, dihFERal/anhFERal, twist/washout, aerofoil designation, max thickness, spar position/dimensions and wing attachment.	Required items	11 listed items	-	3 points each; max 15 from EDR	☐
R5.6	Stabilizer span	Horizontal stabilizer span as proportion of actual total wing span.	Range	30–40	% of wingspan	7 points	☐
R5.6	Stabilizer maximum chord	Use mean aerodynamic chord instead of maximum wing chord where main wing is tapered.	Range	30–40	% of wing chord reference	7 points	☐
R5.6	Stabilizer maximum thickness	Each stabilizer uses symmetric UIUC aerofoil profile; geometry/configuration/stability rationale documented.	Range	30–40	% of maximum wing thickness	7 points	☐
R6.8	Payload documentation	CAD, drawings and FER identify cavity, enclosure, dimensions, position/datums, 6 mm material, installation, cover, screws, payload position and CoG effect; sectional views show material thickness.	Required items	11 listed items		3 points each; max 15 from EDR	☐
R7.7	Launch hook documentation	CAD/drawings/FER identify hook, official geometry/dimensions/reference point, position from nose datum, longitudinal alignment, vertical position, mounting surface/thickness, adhesive and shuttle interface.	Required items	11 listed items		3 points each; max 15 from EDR	☐
R8.2	CoG documentation	CAD identifies CoG, engineering drawings dimension its position, and calculations support it.	Required items	3 listed items	—	3 points each; max 15 from EDR	☐
R8.3	CoG calculations	Document CoG without payload, with payload, and with all permanent components; identify component masses/locations, payload location, datum and final CoG.	Calculation completeness	All listed cases and inputs	—	Documentation Check	☐
R8.4	Longitudinal static stability	Document aerodynamic centre/neutral point estimate, CoG, static margin, tail-volume/equivalent reasoning and payload effect; static margin ≥5% MAC.	Minimum static margin	5	% MAC	Critical	☐