

Project Timeline

Machine Bed & Yaw System

Project Title: Design and Development of a 5 MW Onshore Wind Energy Converter for the Syrian Market

Project Duration: 23 September 2025 – 31 January 2026

Institutions Involved: Hochschule Flensburg, Hochschule Kiel, Damascus University

Supervising Professor: Prof. Dr. Ing. Quell

Team members: Shoukat Abbas, Luksh Chawla, Sathishkumar Venkatachalam, Shrihari Kadam

Project Head: Bakhtyar Karim

System Integrator: Federico DeMita

Timeline and Milestones

Project Weeks	Due Date	Key Focus
Week 0	23 September 2025	Kick-off meeting, topic allocation (Machine Bed & Yaw System).
Week 1	30 September 2025	Literature collection on yaw and bedplate systems.
Week 2	7 October 2025	Study of yaw system concepts. Review of standards (IEC 61400, DNV). Reading Optimus Shakti reports for baseline understanding.
Week 3	14 October 2025	Load comparison (Shakti vs Syria): axial, radial, and moment loads. Scaling with rotor diameter. Defined yaw bearing size (3.8 m).
Week 4	21 October 2025	Started rough sketches of machine bed (casted & welded). Basic 3D-Machine bed design.
Week 5	21 – 27 October 2025	Will finalize load-transfer ($\Sigma F=0$, $\Sigma M=0$) from calculation sheet for bed supports. Confirm load comparison and coordinate reference.
Week 6	28 October – 3 November 2025	Begin detailed sketches: side & top view of machine bed and tower interface. Identify torque arm, lever arm, and space constraints for yaw drives.
Week 7	4 – 10 November 2025	Research yaw components more: bearing, brake calipers, and drives. Will confirm number and placement of yaw drives (4–6). Define geometric arrangement on tower top.
Week 8	11 – 17 November 2025	Start report writing (structure, introduction, background). Continue load-transfer tool and early verification of bearing/bed loads.
Week 9	18 – 24 November 2025	Complete sketches integration (bed + yaw + tower). Draft results for report: load comparison, bearing layout, design discussion.
Week 10	25 November – 1 December 2025	Report refinement: add figures, citations, and summary of yaw system research. Internal review and proof-check.
Week 11	2 – 8 December 2025	Finalize report for submission.
Week 12	9 – 15 December 2025	Prepare presentation slides + timeline verification.

Week 13	23 December 2025	Final review, feedback incorporation, and documentation hand-off.
Week 14	30 December 2025	Holidays
Week 15	6 January 2026	Final works
Week 16	13 January 2026	Final works
Week 17	20 January 2026	Final works
Week 18	27 January 2026	Submission final report
Week 19	03 February 2026	Final Presentation

References:

1. International Electrotechnical Commission (IEC). IEC 61400 1: Wind turbines – Part 1: Design requirements. 4th Edition. Geneva: IEC, 2019.
2. Det Norske Veritas (DNV) & Risø National Laboratory. Guidelines for Design of Wind Turbines. 2nd Edition. Copenhagen: DNV and Risø, 2002.
3. DNV. DNVGL ST 0437: Loads and Site Conditions for Wind Turbines. Oslo: DNV, 2016.
4. National Renewable Energy Laboratory (NREL). OpenFAST Documentation Portal. Golden, CO: NREL, 2020–2025. <https://openfast.readthedocs.io>
5. Quell, P. & Karim, B. (2025) Optimus Syria Project Contract, Hochschule Flensburg University of Applied Sciences.
6. International Electrotechnical Commission (IEC). IEC 61400 22: Conformity Testing and Certification of Wind Turbines. Geneva: IEC, 2010.