Budapest University of Technology and Economics
Faculty of Mechanical Engineering
Department of Fluid Mechanics
http://www.ara.bme.hu/

FINAL PROJECT ASSIGNMENT

CLASSIFIED

Identification			
Name: **Olgyay Ábel**		ID: **72423688630**	
Code of the Curriculum: 2N-MW0		Specialisation: 2N-MW0-FM	Document ref. number: GEÁT:2023-1:2N-MW0:GLHJ6P
Curriculum: Gépészeti modellezés mesterképzési szak			
Final Project issued by: Department of Fluid Mechanics		Final exam organised by: Department of Fluid Mechanics	
Supervisor: Dr. Balogh Miklós (71427777405), assistant professor			

Project Description	
Title	**Performance evaluation of OpenFOAM, an Open-Source simulation software in pump design** Az OpenFOAM nyílt forráskódú szimulációs szoftver teljesítményének értékelése szivattyú tervezése során
Details	1. Literature review of OpenFOAM in turbomachinery application, cloud-based OpenFOAM usage options. 2. Run a previously tested pump model using the OpenFOAM solver with an existing mesh, for at least six different volume flow rates. 3. Describe the modeling method in detail. Evaluate the delivery height, internal efficiency, flow pattern, pressure distribution, and spatial distribution of turbulent production. 4. Using an existing pump model, determine the pump suction capacity based on the 3% head-drop condition by changing the NPSHa value, for at least one flow rate. 5. Using cloud-based computing, examine how the computation time changes with the number of processor cores when using the OpenFOAM solver. 6. Compare the OpenFOAM results with the existing ANSYS CFD calculations and the time required for the solution when using the same processor performance. 7. Describing the turbulence models and cavitation models available in OpenFOAM in comparison with the ANSYS CFD system. 8. Preparation of the thesis according to the formal requirements.
Advisor	Advisor's Affiliation: Flowserve Hungary Services Kft., 1097 Budapest, Gubacsi út 6b. Advisor: Péter Tóth, specialist engineer

Final Exam			
1st subject (group)	2nd subject (group)	3rd subject (group)	4th subject (group)
ZVEGEÁTNW02 Computational Fluid Dynamics	**ZVEGEÁTNW03** Fluid Mechanics Measurements	**ZVEGEÁTNW08** Building and Environmental Aerodynamics	**ZVEGEÁTNW19** Vehicle Aerodynamics

Authentication		
Handed out: 5 September 2022		Deadline: 9 December 2022
Compiled by: Dr. Balogh Miklós (71427777405) Supervisor	Verified by: *Dr. János Vad* (signed) Head of Department	Approved by: *Dr. Gábor Györke* (signed) Vice-Dean
The undersigned declares that all prerequisites of the Final Project have been fully accomplished. Otherwise, the present assignment for the Final Project is to be considered invalid. …….. *Olgyay Ábel*		