



# FINAL PROJECT ASSIGNMENT

**CLASSIFIED**

<b>Identification</b>	Name: <b>Prasad Renju Kurian</b>		ID: <b>73359418042</b>	
	Code of the Curriculum: <b>2NAMW0</b>		Specialisation:	Document ref. number:
	Curriculum: <b>Master Program in Mechanical Engineering Modelling</b>		<b>2NAMW0-FM</b>	<b>GEÁT:2020-1:2NAMW0:PMP204</b>
	Final Project issued by: <b>Department of Fluid Mechanics</b>		Final exam organised by: <b>Department of Fluid Mechanics</b>	
	Supervisor: <b>Dr. Balázs Farkas (71560429247), assistant professor</b>			
<b>Project Description</b>	<b>Titée</b>	<b>Calculation of standard valve characteristics using CFD model with overset mesh interfaces</b> Általános szabályzószelép karakterizikájának meghatározása overset hálózási eljárást alkalmazó CFD modell segítségével		
	<b>Details</b>	<ol style="list-style-type: none"> <li>Literature search on the different types of control valves for single phase flows.</li> <li>Overview of the standardized characterization of control valves based on EN 60534 industry standard for example. Differences in the standard performance characterization of incompressible and com-pressible flow valves.</li> <li>Overview of CFD calculation of fluid flow in valves. Different type of losses inside the control valve and the requirement on the CFD calculation in order to be able to accurately capture the physics.</li> <li>Identify challenges of CFD calculation of standard valve parameters (<math>C_v, X_t</math>).</li> <li>Define a CFD setup used for calculating the valve characteristics based on the standard measurement procedure.</li> <li>Create the CFD model without mesh interfaces for the simplified rotatory disk valve, and linear type valve geometry provided by Flowserve.</li> <li>Create the CFD model for the same geometries with overset mesh interfaces.</li> <li>Compare the two different modeling approaches in the 5-100% opening range, for both compressible and incompressible valve characterization.</li> <li>Investigate the flow features and physics phenomenon by visualizing the flow of the different geometries at two different opening positions.</li> <li>Create the summary of the findings, emphasize the pros and cons of the different work-flow and also the accuracy of the different CFD approaches in terms of standard valve characteristics</li> <li>Summarize the work in the required document format of the MSc Thesis!</li> </ol>		
	<b>Advisor</b>	<b>Advisor's Affiliation:</b> Flowserve Hungary Services Kft; 1097 Budapest, Gubacsi út 6B <b>Advisor: Péter Tóth, simulation engineer</b>		
<b>Final Exam</b>	1 <sup>st</sup> subject (group)	2 <sup>nd</sup> subject (group)	3 <sup>rd</sup> subject (group)	4 <sup>th</sup> subject (group)
	<b>ZVEGEÁTMW02</b> Computational Fluid Dynamics	<b>ZVEGEÁTMW03</b> Flow Measurements	<b>ZVEGEÁTMW08</b> Building Aerodynamics	<b>ZVEGEÁTMW19</b> Aerodynamics and Its Application for Vehicles
<b>Authentication</b>	Handed out: 15 September 2020		Deadline: 11 December 2020	
	Compiled by: <b>Dr. Balázs Farkas (71560429247)</b> Supervisor		Verified by: <i>Dr. János Vad (signed)</i> Head of Department	
	Approved by: <i>Dr. Péter Bihari (signed)</i> 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.  ..... <i>Prasad Renju Kurian</i>				