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

FINAL PROJECT ASSIGNMENT

Publicly Available

Identification

Name: **Ridha Rasyid**			ID: **73593798329**
Code of the Curriculum: 2NAMW0		Specialisation: 2NAMW0ERA	Document ref. number: GEÁT:2021-T:2NAMW0:MPL960
Curriculum: Master Program in Mechanical Engineering Modelling			
Final Project issued by: Department of Fluid Mechanics		Final exam organised by: Department of Fluid Mechanics	
Supervisor: Joshua Patrick Davidson (71569852589), research fellow			

Project Description

Title	**CFD investigation of water wave transformation over varying bathymetry** Változó vízmélység-mérés alapú hullámenergia átalakító CFD vizsgálata
Details	Industrial partners have demonstrated experimentally the potential benefits, for coastal protection and wave energy conversion, of exploiting the resulting wave transformations which occur when an ocean wave progresses over variable bathymetry. The goal of this project is to further the understanding and optimisation of this concept, through numerical simulations. In particular, the student will develop a numerical wave tank in ANSYS FLUENT, whose bathymetry and input wave conditions can be parametrised to enable automated simulations of many different scenarios. The results of these simulations will then be analysed to provide relevant information and guidelines regarding the optimal bathymetry design for different sea conditions. To achieve this goal the following specific tasks must be implemented: 1. Literature survey - surveying and analysing relevant resources of technical literature 2. Numerical wave tank setup: a. Create a numerical wave tank with a constant flat bathymetry to provide the baseline case; b. Create post-process tools to analyse the waves; c. Extend the numerical wave tank to allow the creation of variable bathymetries 3. Simulations: a. Perform simulations on different classes of variable bathymetries in a range of wave conditions (Wave heights, frequencies, etc.) 4. Analysis: a.Analyse the results to understand the relationships between the bathymetry design and the wave transformation; b. Provide guidelines on the optimal bathymetry design for different sea conditions 5. Reporting: a. Summarise the work in the required document format of the MSc Thesis.
Advisor	Advisor's Affiliation: Advisor: —

Final Exam

1st subject (group)	2nd subject (group)	3rd subject (group)	4th subject (group)
ZVEGEÁTNW02 Computational Fluid Dynamics	**ZVEGEÁTNW03** Fluid Mechanics Measurements	**ZVEGEÁTNW11** Open Source Computational Fluid Dynamics	**ZVEGEÁTNW19** Vehicle Aerodynamics

Authentication

Handed out: 8 February 2021		Deadline: 14 May 2021
Compiled by: Joshua Patrick Davidson (71569852589) Supervisor	Verified by: *Dr. János Vad* (signed) Head of Department	Approved by: *Dr. Péter Bihari* (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.

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Ridha Rasyid