

**UNIVERSITI TEKNOLOGI MARA**

**FINITE ELEMENT ANALYSIS ON  
DEVELOPMENT OF ECO-  
FRIENDLY SWATH FOR  
SUSTAINABLE RECREATIONAL  
PURPOSES**

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Dissertation submitted in partial fulfilment  
of the requirements for the degree of  
**Diploma in Mechanical Engineering**

**College of Engineering**

**February 2025**

## **ABSTRACT**

This project investigated the structural analysis of a Small Waterplane Area Twin Hull (SWATH) vessel using Finite Element Analysis (FEA), focusing on total deformation and equivalent Von-Mises stress. Due to the growing popularity of leisure boating, the necessity for environmentally friendly and structurally efficient marine vehicles has increased. The research assessed the vessel's structural integrity by analyzing its deformation and stress distribution under various loading conditions. To assess material performance, optimize structural elements, and guarantee adherence to safety and sustainability regulations, FEA simulations were carried out. Material optimization operational conditions simulation, and detailed SWATH structure modelling were all part of the study. The findings provide details on the vessel's capacity to tolerate operational strains while reducing deformation. The building of safer and more effective marine leisure boats is aided by this structural analysis study.

## **ACKNOWLEDGEMENT**

Firstly, I wish to thank God for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, Ts. Dr. Shahrul Hisyam Marwan and also Sir Matzaini Katon who guide me through this final year project.

Finally, this dissertation is dedicated to my father and mother for their vision and determination to educate me. This piece of victory is dedicated to both of you. Alhamdulillah's.

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