FACULTY OF MECHANICAL ENGINEERING
MARA UNIVERSITY OF TECHNOLOGY
SHAH ALAM, SELANGOR D.E.

FINAL YEAR PROJECT REPORT

DETERMINATION OF STRESS DISTRIBUTION ALONG THE SPECIMEN WIDTH FOR ANY LAMINATE AND PREDICTION OF NOTCHED STRENGTH BY USING APPROPRIATE FORMULATION AND COMPUTATIONAL METHOD.

PROJECT ADVISOR
ENCIKYAKUBT^IB

PREPARED BY
AZIHAN BIN AftOHAMAD (98027640)

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ANUAR BIN ABDUL RAHMAN (98405144)

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ABSTRACT.

This project investigates the materials mechanical responses due to holes by using both computational and experimental approaches. The computational approach will be based on using suitable programs or software. In general, the project will determine:

1. Stress-distribution along the specimen width for any laminate type, and
2. Prediction of notched strength using appropriate formulation and Computational method.

Polymeric composite based on continuos glass.carbon and organic fibers have found wide application in many branches of modern engineering. High - strength and high - modulus reinforced plastics posses a unique combination of mechanical technological and service properties. They differ from other traditional structural materials in the fact that the design of composite components and articles cannot be carried out separately from the design and development of initial materials, beginning with the selection and preparation of raw materials.

This mentioned about cracks & holes found in service and their discremental effects on the materials performance. Hence the importance of predicting the strength due to the presence of these defect.

With different types of laminate for Carbon/Epoxy we do some calculation based on theoretical approach and the data found from the Journal and also from the books. After that, by using the computer program we can get the stress concentration factor of any laminate .Also we can found the stress distribution along the plate width where the stresses start from the hole edge. This investigation actually ,can use finite element method where it requires the use of computers to calculate stresses and strains in each ply and to investigate the structure. Many user oriented general purpose finite element packages such as MSC - NASTRAN,NISA,ANSYS and LUSAS.

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