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PREFACE

As the Millennium Age engineers, we must be ready mentally and physically towards the more competitive and challenging world of Information and Technology (IT).

Therefore engineers must familiarize themselves with the application of engineering program and computer technologies. We must also know the basis of engineering theories, assumptions, derivations and also the manual mathematical calculations.

The objectives of this project are: -

1. Mastering the analysis of structural beam by using the knowledge from the Strength of Material and Finite Element Analysis theories and derivation.
2. Applying the knowledge to the real engineering problems and getting the result using manual mathematical calculations.
3. Mastering the engineering program of *FORTRAN 77* and *LUSAS Modeller*.
4. Make a program using *FORTRAN 77* as a 'User Friendly Program' to simplify the work of engineers in the Analysis of Beam. This will sharpen the engineers programming skills.
5. Comparing the results and findings to be analyzed.

During this project, we learn about working together in-groups and believe that with our enthusiasm, anxiety, skills and the ability to learn quickly, we will be one of the best competent in the real world of IT.

1. INTRODUCTION

Proper planning and good management that are practiced in this project is the main core of success. But before that, we need to know clearly the main objectives and the goals. We also have to understand the engineering problems and steps to solve it in a specific time towards the professionalism that is *the right quality*. This chapter will hopefully give answers to the questions asked. We applied all the knowledge we have learned from this course. We hope that our project to be a good contribution to the society.

These are the summary on what we are doing in this project: -

1. The analysis of beam using theoretical approach to find:
 - i. The Principal stress
 - ii. The displacement and slope when applied force
 - iii. The maximum shear stress

Depending on the various type of material used and the cross section of the beam itself. The problems solves are from real engineering work and the type of material and cross-section use are common to the market.

2. To develop a '*User Friendly Program*' using the language of FORTRAN 77. All the equations used are base on the theoretical formulas. The reasons are to simplify tidies calculations accurately and save time.