

A PROJECT REPORT ON
**“FEA ANALYSIS OF COMPOSITE PROPELLER
SUBJECTED TO RANDOM VIBRATIONS”**

A project report submitted in partial fulfillment of the requirements for the award of the degree of

**BACHELOR OF TECHNOLOGY
IN
MECHANICAL ENGINEERING**

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(PERMANENTLY AFFILIATED TO JNTU-KAKINADA, ACCREDITED
BY NBA & NAAC, APPROVED BY AICTE, RECOGNISED BY UGC 12f & 2b)

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MAKAVARAPALEM, NARSIPATNAM (RD), VISAKHAPATNAM-531113ENGINEERING

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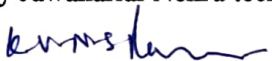
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CERTIFICATE

This is certify that the project work entitled “**FEA ANALYSYS OF COMPOSITE PROPELLER SUBJECTED TO RANDOM VIBRATIONS** ” is a bonafied record of work done by N. GANESH NAIDU (17811A0342), D. YUGANDAR (17811A0313), G. MANIKANTA (17811A0323) AND CH. VASU (17811A0311) in partial fulfilment of the requirement for the award of Bachelor of technology in MECHANICAL ENGINEERING by Jawaharlal Nehru technological university, Kakinada During the year 2017-2021.


PROJECT GUIDE
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ABSTRACT

Propellers are used to propel ships and undersea vehicles such as submarines and torpedoes. Propulsors, in general, are employed as propulsive devices and to provide sufficient thrust force to propel the vehicle at its operational speed and RPM. The blade geometry and design are more complicated, with a large number of control factors. The rotation of a propeller made of conventional isotropic materials produces increased vibration and noise. In terms of stealth in defence systems, it is undesirable. The rising demand for lightweight structural elements with acoustic insulation has led to the introduction of fiber reinforced multi-layered composite propellers in recent years. The investigation method involves simulating and analyzing the strength of an underwater vehicle's propeller blade. A propeller is a complex geometry that necessitates the use of advanced modelling software where CATIA is used to design the propeller geometry. Advanced numerical simulation systems (ANSYS) are used to perform static modal analysis of propellers constructed of carbon fiber reinforced composite (CFRP) & glass fiber reinforced composite (GFRP) materials. A structural and random vibration analysis is carried out to determine mode shapes and stability of the propeller under different loading conditions. The results are iterated for different material grades to identify best suitable material to be employed in propulsive systems.

KEYWORDS: COMPOSITE PROPELLER ANALYSIS, MODAL ANALYSIS, RANDOM VIBRATION ANALYSIS