



Department of Mechanical and Aerospace Engineering
Indian Institute of Technology Hyderabad
Kandi - 502285, Sangareddy, Telangana, India

MAE Industry Lecture 3 | ME6100 Industry Lecture



Title: Mechanical Design Considerations for Electronic Warfare Systems Design

Speaker: Dr M. Gopal

Affiliation: Scientist-F, Defence Electronics Research Laboratory (DLRL), Hyderabad

Abstract | Integrating mechanical engineering in the design of electronic warfare (EW) systems is essential to ensure performance, reliability, and sustainability across diverse platforms. The mechanical design of EW systems for platforms such as space, airborne, aerostat, UAV, ground vehicles, naval ships, and submarines focuses on ensuring structural integrity, thermal management, vibration isolation, and material optimization to meet the demands of challenging environments.

This lecture will cover the mechanical loads, environmental challenges encountered across various platforms, and the mechanical design strategies employed to address them. A practical case study of India's first indigenously developed anti-drone system by DRDO will be presented, highlighting its challenges, design methodology, and the journey to its successful demonstration. The talk will conclude with a discussion on futuristic challenges in the mechanical design of electronic warfare systems and the innovations needed to overcome them.

About the Speaker | Dr. Gopal, Scientist-F at the Defence Electronics Research Laboratory (DLRL), Hyderabad, specializes in structural engineering for defence applications. Holding a B.Tech in Mechanical Engineering from NIT Calicut and a Ph.D. from IIT Madras, he excels in inverse electromagnetic scattering, computational mechanics & electromagnetics, and structural & experimental modal analysis. His doctoral research focused on reconstructing the shape of buried metallic pipes using limited view backscattered electromagnetic data, advancing the field of microwave non-destructive evaluation.

With nearly two decades in defence R&D, Dr. Gopal has significantly contributed to designing electronic warfare systems for platforms such as UAVs, aircraft, ships, submarines, and space systems. In 2014, he was commended by the Scientific Advisor to the Raksha Mantri for designing high-strength composite radomes for the Advanced Technology Vessel Projects (ATVP). His innovative work earned him Technology Group Awards in 2015, 2020, and 2021 and the prestigious Agni Award for Self-Reliance in 2019. He is working on indigenizing high-thrust compact drones for defence applications.

Dr. Gopal's extensive publications in peer-reviewed journals and conferences cover radome design, finite element analysis, and structural analysis for electronic enclosures. His contributions underscore a strong commitment to advancing India's defence capabilities and promoting self-reliance in critical systems.

Date: 05/02/2025

Time: 1430 Hrs.