



ELECTRONICS ENCLOSURES THERMAL ISSUES

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PRE-REQUISITES :12th Standard

INTENDED AUDIENCE : Registrants to BSc, BE, B.Tech, MSc and ME, M.Tech courses, Product design engineers (in related industry) Product Managers

INDUSTRIES APPLICABLE TO : Electronics and Mechanical involved in enclosure Design

COURSE OUTLINE : Electronics Design is understood as analysis and implementation at various levels from large systems installation to chip design. One of the aspects is failure due to temperature effects is constantly under study. Theory of Heat transfer has been understood and explained way back in 1700. Rigor and precision has resulted in seemingly complicated 'equations'. In the design of enclosures, managing heat is (relatively) well understood. Empirical results can be used to optimise the layout and reduce failure. Practices in use of heat management hardware are available from specialist manufacturers and can be used. This course is an attempt to familiarise the participating registrants with heat related issues in Design of Electronic Product enclosures.

ABOUT INSTRUCTOR :

Prof. N.V.Chalapathi Rao has worked in Defense R & D for 8 years. Has been delivering lectures since 1984 on topics related to equipment design at CEDT, DESE and CPDM of IISc. Has guided and built more than 100 projects at M. Tech level

COURSE PLAN :

1. Introduction to Enclosures and thermal issues
2. Basics of conductive heat transfer
3. Radiation at normal ambient
4. Convection basics
5. Forced convection
6. Combined modes

7. Use of Conduction in enclosures
8. Radiation as a speciality
9. Convective cooling in small products
10. Forced cooling in medium and large systems
11. Liquid cooled high power modules
12. Novelty phase change and thermo electric
13. Refrigerated cabinets

14. Heat sinks practical application
15. Blowers, fans, ventilations of systems
16. Instrumentation for measurement
17. Effects on sealed enclosures

18. Integration of ID with the heat aspects
19. Case stories in biological instruments
20. Case study of select participants' work
21. Application of Thermal CAD and round up