



# ENCLOSURE DESIGN OF ELECTRONICS EQUIPMENT

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**INTENDED AUDIENCE:** 3rd Year UG and PG

**PREREQUISITES:** 12th Standard

## **COURSE OUTLINE :**

The purpose of this course is to sensitise a registrant to various aspects of an electronics product. Specifically on non electrical aspects like mechanical design and detailing. Starting from a need translated into specifications, leading to design and prototyping and ending up in a manufacturable physical prototype

## **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 :**

- Introduction to Products
- Industrial Design and Product Design
- Types of products ID as per ICSID and WIPO
- Creativity in Product Design
- Needs VS features
- Product Conceptualisation
- Sketching Basics
- Sketching as a design tool
- Using illustration software
- Role of packaging and enclosures
- Use of IP approved sets
- Design of purpose built enclosures
- Physical simulation of a small system
- Basics of building a prototype mock up
- Skills and specification in alternate material
- Use of off the shelf electronic system
- Gumstix, Beagle, Ragsberry, Arduino, Kit application. Adaption for I/O
- Development of Enclosures with Laser tools. Use of Flat Plastics
- Product Specific Enclosure design
- Application of CAD tools (Dassault, Siemens, Autodesk, McNeil)
- Design for FDM (3d printing)
- Specifics of Design for production scale-up
- Design of I/o interfaces Front panel layout and graphics
- Basics of ergonomics
- Connectors and wiring
- Integration and Validation
- Manufacturing documentation
- Applicability for industry specific detailing
- Sourcing and logistics of hardware
- Areas for specialisation and future study
- Review of course